Medford City Council Meeting

Agenda

November 1, 2018
6:00 P.M.
Medford City Hall, Council Chambers
411 West 8th Street, Medford, Oregon

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10. Roll Call

20. Recognitions, Community Group Reports

30. Oral Requests and Communications from the Audience
Comments will be limited to 4 minutes per individual, group or organization. PLEASE SIGN IN.

40. Public Hearings
Comments are limited to a total of 30 minutes for applicants and/or their representatives. You may request a 5-minute rebuttal time. Appellants and/or their representatives are limited to a total of 30 minutes and if the applicant is not the appellant they will also be allowed a total of 30 minutes. All others will be limited to 4 minutes. PLEASE SIGN IN.

40.1 COUNCIL BILL 2018-123 A resolution adopting the Consolidated Annual Performance and Evaluation Report (CAPER) pertaining to Community Development Block Grant (CDBG) funds for the 2017-18 program year.

40.2 COUNCIL BILL 2018-124 An ordinance proclaiming annexation to the City of Medford of an approximate 1.65 acre parcel, including an adjacent right-of-way, located on the southeast corner of Table Rock Road and Biddle Road (4256 Table Rock Road), and concurrent zone change from County LI (Light Industrial) to City I-L (Light Industrial) and designated within the Limited Industrial Overlay District (I-00), and withdrawal of said property from Medford Rural Fire Protection District #2, effective pursuant to State Law. (A-18-083) Land Use, Quasi-Judicial

40.3 COUNCIL BILL 2018-125 An ordinance approving a legislative amendment to the Environmental Element and the Conclusions, Goals, Policies, and Implementation Strategies of the Medford Comprehensive Plan to incorporate the 2017 Natural Hazards Mitigation Plan. (CP-18-063) Land Use, Legislative

40.4 COUNCIL BILL 2018-126 An ordinance adopting a revised Transportation System Plan (2018-2038) and approving a legislative amendment to the Transportation Element, Public Facilities Element, and the Conclusions, Goals, Policies, and Implementation Strategies of the Medford Comprehensive Plan. (CPA-16-036) Land Use, Legislative

50. Approval or Correction of the Minutes of the October 18, 2018 Regular Meeting

60. Consent Calendar
60.1 COUNCIL BILL 2018-127 An ordinance authorizing the execution of an agreement with the City of Medford and Medford Police Officers Association pertaining to salary, hours, fringe benefits, and other working conditions for July 1, 2018 through June 30, 2021.

Meeting locations are generally accessible to persons with disabilities. To request interpreters for hearing impaired or other accommodations for persons with disabilities, please contact the ADA Coordinator at (541) 774-2074 or ada@cityofmedford.org at least three business days prior to the meeting to ensure availability. For TTY, dial 711 or (800) 735-1232.

60.2 COUNCIL BILL 2018-128 An ordinance authorizing cash payments to Hayden Homes LLC for Street System Development Charge credits in the amount of $291,512.08 for right-of-way dedication and street construction on Owen Drive completed as a condition of approval for Delta Estates Phase 2 & 3.

60.3 COUNCIL BILL 2018-129 An ordinance authorizing the execution of an agreement granting Community Development Block Grant funds in the amount of $250,000.00 to Youth 71five Ministries for the acquisition and renovation of real property located at 11 Almond Street.

70. Items Removed from Consent Calendar

80. Ordinances and Resolutions

90. Council Business

90.1 Proclamations issued:
Extra Mile Day, November 1, 2018
Veterans' Day – November 11, 2018

90.2 Committee Reports and Communications

100. City Manager and Staff Reports

100.1 Further reports from City Manager

110. Adjournment

CITY OF MEDFORD
AGENDA ITEM COMMENTARY

www.ci.medford.or.us

Item No: 40.1

DEPARTMENT: Planning Department
PHONE: (541) 774-2390
STAFF CONTACT: Angela Durant, Principal Planner

AGENDA SECTION: Public Hearings
MEETING DATE: November 1, 2018

COUNCIL BILL 2018-123
A resolution adopting the Consolidated Annual Performance and Evaluation Report (CAPER) pertaining to Community Development Block Grant (CDBG) funds for the 2017-18 program year.

SUMMARY AND BACKGROUND
Council is requested to consider approval of a resolution to adopt the City's 2017/18 Consolidated Annual Performance Evaluation Report (CAPER) associated with the City's Community Development Block Grant (CDBG) program. As per federal regulations, the City is required to submit a CAPER to the U.S. Department of Housing and Urban Development (HUD) at the end of each program year. The 2017/18 CAPER reflects performance outcomes of public service programs, housing projects and other eligible development activities completed during the fiscal year ending June 30, 2018. This period concludes the third year of the 2015-2019 Consolidated Plan for Housing and Community Development. The Consolidated Plan is the driving document for annual CDBG funding allocations and expected performance outcomes. The CAPER provides an evaluation of the following categories: a) one-year and five-year expected versus actual outcomes; b) racial, ethnic and income composition of beneficiaries; c) resources, investments and leveraging; d) affordable housing; e) homeless and other special needs; f) public housing; g) other actions to address community needs; h) program monitoring; i) changes in CDBG program objectives.

HUD requires the City to conduct a 15-day public comment period and public hearing to solicit citizen input pertaining to the 2017/18 CAPER. The comment period began October 3, 2018, and ended on November 1, 2018. The Housing and Community Development Commission held an informal meeting on Wednesday, October 17, 2018, to solicit additional comments from the public. This public hearing is the final step prior to seeking Council approval of a resolution to adopt the 2017/18 CAPER for submission to HUD.

PREVIOUS COUNCIL ACTIONS
On May 7, 2015, Council approved Council Bill 2015-46 adopting the 2015-2019 Consolidated Plan for Housing and Community Development to establish the City's priority needs and goals associated with the use of CDBG funds. This resolution also adopted the 2015/16 Action Plan for use of CDBG funds for the fiscal year 2015-16.

On June 4, 2015, Council approved Council Bill 2015-57 adopting the budget for the City of Medford for the biennium commencing July 1, 2015.

On May 5, 2016, Council approved Council Bill 2016-57 adopting the 2016/17 Action Plan for use of CDBG funds for the fiscal year 2016-17.

On September 15, 2016, Council approved Council Bill 2016-120 adopting the 2015/16 CAPER to report performance data for the program year ending June 30, 2016.

On June 1, 2017, Council approved Council Bill 2017-54 adopting the 2017/18 Action Plan for use of CDBG funds for the fiscal year 2017-18 and a Substantial Amendment to the 2016/17 Action Plan to allocate any surplus funds to the Medford Senior Center Facility Improvement project.

On June 15, 2017, Council approved Council Bill 2017-57 adopting the budget for the City of Medford for the biennium commencing July 1, 2017.

On May 3, 2018, Council approved Council Bill 2018-40 adopting Substantial Amendment No. 1 to the 2017/18 Action Plan to allocate funds to Rogue Valley Youth for Christ for rehabilitation of Fire Station #2 to be used as a youth community center.

On June 21, 2018, Council approved Council Bill 2018-65 adopting Substantial Amendment No. 2 to the 2017/18 Action Plan to expand Habitat for Humanity's scope of 1026 W 10th Street from acquisition for rehabilitation of one unit to new construction of three units.

On September 20, 2018, Council approved Council Bill 2018-112 adopting a fourth Supplemental Budget for the 2017-19 biennium.

ANALYSIS

The City's 2015-19 Consolidated Plan identifies 16 strategies associated with meeting three goals including: 1) Improve the condition and availability of affordable housing; 2) Improve the ability of low/moderate-income residents to become self-sustaining through the availability of public services; and 3) Improve living conditions through improvements to public infrastructure, community facilities and neighborhood revitalization. (Exhibit A summarizes the annual expenditures made under each strategy for the five-year consolidated plan period.) The City applied 12 strategies to produce outcomes under all three goals as documented in the 2017/18 CAPER.

Performance highlights related to the nine categories referenced in the above Summary and Background are highlighted below. Further explanation is provided in the 2017/18 CAPER.

a) The City served more persons or households than expected in the categories of public services, homeless prevention services and public facility and infrastructure activites. Additionally, demolition of the one city-owned building was completed. Indicators that underperformed include public facility improvement, housing related public infrastructure, new affordable housing added and rehabilitation of existing units. The majority of projects under these categories experienced delays associated with the environmental review and procurement processes, a lack of construction labor and rising construction costs. (See pages 2 through 6 of the CAPER for further explanation.)

b) The majority of the beneficiaries served were White and Non-Hispanic; 89% and 69.5%, respectively. Of those tracked for income, 34.3% earned ≤ 30% of the Area Median Income (AMI), 22.2% earned ≤ 50% AMI, and 43.5% earned ≤ 80% AMI. (See pages 9 and 14 of the CAPER for further explanation.)

c) Ten of the 15 subrecipients expended a combined total leverage of $2,886,565. (See page 11 of the CAPER for further explanation.)

d) Production of 67 new affordable housing units and rehabilitation of one existing unit were delayed because of environmental issues associated with the subject and/or adjacent properties, or availability of affordable contractors. (See pages 12 and 13 of the CAPER for further explanation.)

e) Six nonprofits provided public services to a total of 2,178 individuals. Four of these agencies provided homeless prevention services to 2,021 of the 2,178 served. (See pages 15 through 18 of the CAPER for further explanation.)

f) All units originally funded under HUD's old Public Housing program went through a disposition process in 2007. Housing Authority of Jackson County, the region's Public Housing Agency and owner of all public housing units, sold them at fair market value during the disposition process. The

proceeds have been used to leverage construction of new units subsidized under HUD's Housing Choice Voucher Program. (See page 19 of the CAPER for further explanation.)

g) The City took a collaborative, solutions-based approach to addressing barriers to affordable housing development, improving institutional structure, facilitating public-private partnership and overcoming impediments to fair housing choice. Key actions include: 1) adoption of the Urban Growth Boundary Expansion; 2) completion of a Housing Strategy that stimulated adoption of the Affordable Housing Construction Excise Tax Program, System Development Charge Deferral Program and a new permanent Housing Advisory Commission; 3) championing the regional Continuum of Care; and 4) securing additional funding through the federal Neighborhood Stabilization Program. (See pages 20 through 25 of the CAPER for further explanation.)

h) The City conducted HUD-mandated on-site monitoring reviews with Housing Authority of Jackson County, Medford Senior Center and Consumer Credit Counseling. No major findings were identified during the process. (See page 25 of the CAPER for further explanation.)

i) The City's major initiatives throughout the year focused on reducing barriers to development of affordable housing, implementing strategies to reduce homelessness, and addressing problem properties. CDBG program objectives were not altered during the 2017/18 program year.

FINANCIAL AND/OR RESOURCE CONSIDERATIONS
Rounded accordingly, resources made available during the 2017/18 program year totaled $1,598,884, of which $975,840, or 61%, was expended. The City is on track to expend the remaining resources of $623,043 during the 2018/19 program year ending June 30, 2019. The City maintained HUD mandated entitlement allocations by expending 12.01% on Public Services and 14.50% on Program Administration.

TIMING ISSUES
The City Council must consider for approval the CAPER on November 1, 2018, to submit to HUD on November 5, 2018.

COUNCIL OPTIONS
Approve the resolution as presented.
Modify the resolution as presented.
Decline the resolution and provide staff direction.

STAFF RECOMMENDATION
Staff recommends Council adopt the resolution approving the 2017/18 CAPER.

SUGGESTED MOTION
I move to approve the resolution authorizing adoption of the 2017/18 CAPER to be submitted to HUD.

EXHIBITS
Resolution
Exhibit A - 2015-19 Consolidated Plan Summary of Annual Expenditures by Strategy
2017/18 CAPER

RESOLUTION NO. 2018-123

A RESOLUTION adopting the Consolidated Annual Performance and Evaluation Report (CAPER) pertaining to Community Development Block Grant (CDBG) funds for the 2017-18 program year.

WHEREAS, each year a CAPER is developed and adopted indicating how the activities funded during the program year will meet the needs identified in the City's Consolidated Plan for Housing and Community Development, which is a comprehensive planning document identifying the City's overall housing and community development issues and outlining a five-year strategy to address those issues; and

WHEREAS, the City Council adopted the Consolidated Plan on May 7, 2015; and

WHEREAS, this public hearing is a Housing and Urban Development (HUD) requirement to solicit citizen input regarding the City's CAPER to use CDBG funds for the 2017-18 program year and outlines the goals and strategies that have been met during this first program year; and

WHEREAS, the City Council must approve the 2017-18 CAPER prior to submitting it to HUD for approval, which document in its entirety is available in the City Manager's Office and, as required by HUD, is available for public comment for a 15-day period which ends on November 1, 2018; and

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MEDFORD, OREGON that the Consolidated Annual Performance and Evaluation Report (CAPER) pertaining to Community Development Block Grant (CDBG) funds for the 2017-18 program year, which is on file in the City Recorder's Office, is hereby adopted.

PASSED by the Council and signed by me in authentication of its passage this _____ day of _____, 2018.

ATTEST: _____ _____

City Recorder Mayor

Exhibit A
2015-19 Consolidated Plan
Summary of Annual Expenditures by Strategy
2017 Program Year *(July 1, 2017 - June 30, 2018)*

GOAL 1	**Improve the Condition and Availability of Affordable Housing over a Five-Year Period**		
Objective 1.1	Improve and maintain living conditions, safety and long-term affordability of rental and/or homeowner housing occupied by low/moderate-income households.		
Strategy 1.1.1	Provide no-interest loans to low/moderate-income homeowners for the correction of recognized hazards to health and safety such as leaking roofs, failed heating systems, unsafe wiring, failed plumbing and other necessary eligible repairs.		
	2015	Housing Authority - Homeowner Repair Program	$ 252,240
	2016	Housing Authority - Homeowner Repair Program	219,495
	2017	**Housing Authority - Homeowner Repair Program**	**334,362**
	2017	**PeopleFirst Properties - Rental Rehabilitation Project**	**25,000**
Strategy 1.1.2	Support programs that provide low/moderate-income homeowners and/or renters with minor and emergency repairs, and rehabilitation and weatherization assistance.		
	2015	ACCESS - Navigator and Companion Program for Seniors and Persons with Disabilities	3,653
	2015	Housing Authority - Homeowner Repair Program	*
	2016	Housing Authority - Homeowner Repair Program	*
	2017	**Housing Authority - Homeowner Repair Program**	*
Objective 1.2	Create more opportunities for low/moderate-income residents to secure affordable and livable rental and/or homeowner housing.		
Strategy 1.2.1	Provide financial assistance to help potential low/moderate-income homeowners with down payment and closing costs.		
	2015	No activity	0
	2016	No activity	0
	2017	**No activity**	**0**
Strategy 1.2.2	Support programs that provide financial assistance to low/moderate-income residents with rental deposits, rent and utility payments, and foreclosure prevention services.		
	2015	St. Vincent de Paul - Reducing Homelessness Program	7,000
	2015	Center for Nonprofit Legal Services - Pathways to Self-Sufficiency Program	3,000
	2015	ACCESS - Navigator and Companion Program for Seniors and Persons with Disabilities Program	*
	2016	St. Vincent de Paul - Reducing Homelessness Program	25,000
	2016	Center for Nonprofit Legal Services - Furthering Fair Housing Program	12,000
	2017	**St. Vincent de Paul - Reducing Homelessness Program**	**20,903**

Strategy 1.2.3	Support the creation of higher density, mixed-income and mixed-use housing in the redevelopment of the downtown area.		
	2015	No activity	0
	2016	Housing Authority - *"The Concord,"* Fire Hydrant Installation	24,000
	2017	**No activity**	**0**
Strategy 1.2.4	Provide financial assistance to acquire land and/or improve infrastructure in support of new affordable housing.		
	2015	Housing Authority - *"The Concord,"* Fire Hydrant Installation	*
	2016	Habitat for Humanity - Morian Park Land Acquisition	*Previous ConPlan Expenditure*
	2017	**Habitat for Humanity - Acquisition for New Construction**	**96,251**
	2017	**Housing Authority - *"Newbridge Place,"* Off-site Infrastructure Improvements**	**19,974**
Strategy 1.2.5	Support for housing programs that help homeless persons transition from homelessness to permanent housing.		
	2015	Hearts with a Mission - Sheltering and Safety Net Services Program	18,750
	2015	Maslow Project - Wrap-around Case Management for Homeless Program	15,000
	2015	Community Works - Transitional Living and Financial Empowerment Program	10,000
	2015	St. Vincent de Paul - Reducing Homelessness Program	*
	2015	ACCESS - Navigator and Companion Program for Seniors and Persons with Disabilities Program	*
	2016	Hearts with a Mission - Shelter and Safety Net Services Program	17,500
	2016	Maslow Project - Wrap-around Case Management for Homeless Youth and Families Program	22,500
	2016	Center for Nonprofit Legal Services - Furthering Fair Housing Program	*
	2016	St. Vincent de Paul - Reducing Homelessness Program	*
	2017	**Hearts with a Mission - Emergency Homeless Youth Shelter**	**17,951**
	2017	**Maslow Project - Wrap-around Case Management Program**	**23,455**
	2017	**Center for Nonprofit Legal Services - Affirmatively Furthering Fair Housing Program**	**13,563**
	2017	**St. Vincent de Paul - Reducing Homelessness Program**	**20,903**
Strategy 1.2.6	Reduce barriers to affordable housing by developing a plan to address the Regulatory Barriers Report for Medford, which will include plans to reduce these barriers.		
	2015	No activity	0
	2016	No activity	0
	2017	**Planning Department - ECONorthwest Housing Strategy**	**21,755**
GOAL 2	**Improve the Ability of Low/Moderate-Income and Special Needs Populations to Become Self-Sustaining**		
Objective 2.1	Improve the opportunities of low/moderate-income residents and special needs populations to become self-sustaining through the availability and accessibility of essential support services offered directly through public service agencies.		

Strategy 2.1.1	Support public services agencies that assist low/moderate-income and special needs populations with safety net services to overcome barriers including mental illness, substance abuse, domestic violence, child abuse, physical and mental disabilities, and homelessness.		
	2015	Medford Senior Center - Senior Advocacy Program	7,250
	2015	CASA of Jackson County - Recruit and Train CASA Staff for Abused Children Program	4,500
	2015	Community Volunteer Network - Foster Grandparent Program	7,000
	2015	Hearts with a Mission - Sheltering and Safety Net Services for At-risk and Homeless Youth and Families	*
	2015	Maslow Project - Wrap-around Case Management for Homeless Youth and Families Program	*
	2015	Community Works - Transitional Living and Financial Empowerment Program	*
	2015	St. Vincent de Paul - Reducing Homelessness Program	*
	2015	ACCESS - Navigator and Companion Program for Seniors and Persons with Disabilities Program	*
	2016	Community Volunteer Network - Foster Grandparent Program	9,000
	2016	Hearts with a Mission - Shelter and Safety Net Services Program (Homeless Youth and Families)	*
	2016	Maslow Project - Wrap-around Case Management for Homeless Youth and Families Program	*
	2016	Center for Nonprofit Legal Services - Furthering Fair Housing Program	*
	2016	St. Vincent de Paul - Reducing Homelessness Program	*
	2017	**Hearts with a Mission - Emergency Homeless Youth Shelter**	*
	2017	**Maslow Project - Wrap-around Case Management Program**	*
	2017	**Center for Nonprofit Legal Services - Affirmatively Furthering Fair Housing Program**	*
	2017	**St. Vincent de Paul - Reducing Homelessness Program**	*
	2017	**Community Volunteer Network - Foster Grandparent Program**	**10,172**
	2017	**Consumer Credit Counseling Services - Credit Report Counseling Program**	**4,620**
Strategy 2.1.2	Support programs that provide fair housing services and education to low/moderate-income and special needs populations.		
	2015	Center for Nonprofit Legals Services - Pathways to Self-Sufficiency Program	
	2016	Center for Nonprofit Legal Services - Furthering Fair Housing Program	
	2017	**Center for Nonprofit Legal Services - Affirmatively Furthering Fair Housing Program**	*
Strategy 2.1.3	Support programs that assist low/moderate-income residents to become self-sustaining through job skills training and workforce readiness programs, transportation services, and the availability and affordability of day care and after school care.		
	2015	Rogue Valley YMCA - No Child Left Alone After School Program	7,250
	2015	Kids Unlimited - After School Programs	6,750
	2015	Roots and Wings Child Development - Tuition and Assistance Program	3,653
	2016	No activity	0
	2017	**No activity**	**0**
Strategy 2.1.4	Support programs that provide loans and technical assistance to small businesses, and promote development of mechanisms that will encourage micro-enterprise such as the creation of small business incubators.		
	2015	No activity	0

	2016	No activity	0
	2017	**No activity**	**0**
GOAL 3	**Improve Living Conditions in by Addressing Community Development Projects that Improve Public Infrastructure, Public Facilities and Neighborhood Revitalization Over a Five Year Period**		
Objective 3.1	Improve community infrastructure and facilities, reduce blighting influences, and preserve and build community through neighborhood revitalization in low/moderate-income neighborhoods.		
Strategy 3.1.1	Provide assistance to repair and improve public infrastructure including street improvements, sidewalks, water and sewer improvements, curbs, gutters, lighting and street trees in low/moderate-income neighborhoods.		
	2015	No activity	n/a
	2016	Housing Authority - *"The Concord,"* Fire Hydrant Installation	*
	2017	**Housing Authority - Royal Apartments Infrastructure Improvement Project**	**48,975**
	2017	**City Public Works Department - Neighborhood Infrastructure Improvements Project (sidewalks)**	**136,643**
Strategy 3.1.2	Provide assistance to develop neighborhood facilities such as youth centers, senior centers, parks and recreation facilities, open space and community centers.		
	2015	City Parks and Recreation Department - Jackson Park Renovation Project	40,000
	2015	Medford Senior Center - Parking Lot Renovation Project	24,727
	2016	No activity	0
	2017	**City Parks and Recreation Department - Jackson Park ADA Upgrade Project**	**32,500**
	2017	**City Parks and Recreation Department - Union Park ADA Upgrade Project**	**8,500**
	2017	**Medford Senior Center - Facility Improvement Project**	**13,754**
	2017	**Children's Advocacy Center - Porch Rehabilitation/ADA Upgrade**	**2,500**
Strategy 3.1.3	Support the removal of dilapidated structures and other blighting influences in low/moderate-income areas and on a spot blight basis.		
	2015	No activity	0
	2016	City Building Safety/Code Enforcement - Demolition/Abatement of Unsafe Problem Properties	4,790
	2017	**City Public Works - Demolition of 1615 Thomas Road**	**40,570**
Strategy 3.1.4	Actively enforce City codes to improve the habitability and safety of housing and eliminate blighting influences in neighborhoods.		
	2015	No activity	
	2016	City of Medford Code Enforcement of Blighted Properties	574
	2017	**City of Medford Code Enforcement of Blighted Properties**	**800**

(Note: Funding amounts have been rounded; "" represents funding previously referenced.)*

2017/18 Program Year
Consolidated Annual Performance Evaluation Report

for the

City of Medford
Community Development Block Grant Program

July 1, 2017 through June 30, 2018

Planning Department
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City of Medford

Gary H. Wheeler, Mayor
Brian Sjothun, City Manager

Medford City Council

Tim D'Alessandro, Ward 2
Clay Bearnson, Ward 2
Kay Brooks, Ward 3
Dick Gordon, Ward 1
Tim Jackle, Ward 1
Kevin Stine, Ward 3
Kim Wallan, Ward 4
Michael Zarosinski, Ward 4

Medford Housing and Community Development Commission

Marie Cabler, Chair, Business Owner/General Public
Bill Boehning, Vice Chair, Financial Industry/Development Services
Heidi Hill, Regional Community Health
Denise James, Low-income Homeowner Housing
Rebecca Erickson, Business Manager
John Michaels, Computer Technology Support
Daniel Smith, Business/Public Administration
Paul Tanner, Housing Developer
Carol Fiddler, Social Services
Angela Durant, Staff Liaison
Laura Stewart, Staff Liaison
Dick Gordon, City Council Liaison

Prepared by Community Development Block Grant Program Staff

Angela Durant, Principal Planner
Laura Stewart, Planner

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CR-05 - Goals and Outcomes 91.520(a), 91.520(g)

Progress the jurisdiction has made in carrying out its strategic plan and its action plan. 91.520(a)
This could be an overview that includes major initiatives and highlights that were proposed and executed throughout the program year.

The 2017/18 program year (PY) marked the third year of the City of Medford 2015-19 Consolidated Plan. The City's major initiatives throughout the year focused on reducing barriers to development of affordable housing, implementing strategies to reduce homelessness, and addressing problem properties. City Council and several City departments have contributed to a building year that is expected to launch significant progress for years to come.

Under Council direction, Planning Department staff worked diligently throughout the year to identify and propose strategies that can **reduce the barriers to development of affordable housing**. Key strategies, as presented throughout this report, include increasing available land; generating a less restrictive funding source; implementing new targeted commissions; cultivating unique public-private partnerships; securing additional federal funds; and analyzing policy changes and economic incentive options for presentation to Council during the 2018/19 PY.

Planning Department staff also worked closely with the regional Continuum of Care (CoC) to help implement a region-wide, systematic approach to **addressing homelessness**. CDBG staff served on the CoC Interim Board for six months to restructure the CoC's organization and governance, which ultimately led to a new, higher-level Board where the City Manager assumed a leadership role as Executive Chair in January 2018. Shortly after, City Council followed with a $30,000 grant to hire a new CoC Coordinator. This series of championing actions has sparked a whole new culture to collaboratively address homelessness across the region.

The City's interdepartmental approach to **addressing problem properties** has been empowered by Council actions including adoption of the International Property Maintenance Code, Receivership Ordinance and Chronic Nuisance Property Ordinance; approval of CDBG and Neighborhood Stabilization Program (NSP) projects; and active participation in community conversations. The Building Department and Code Enforcement Division implemented an interdepartmental collaboration with the Planning Department, Legal Department and City Recorder to target 96 properties. Of this number, 70 have been resolved, rehabilitated, or marked for rehabilitation or redevelopment to affordable housing. This key initiative has had a major impact on the city ranging from established public-private partnerships to a new-found demonstration of community giving and volunteerism.

Outside of CDBG staff time, the above initiatives triggered 2017/18 PY expenditures totaling $186,176. Funded projects included the research and analysis of housing strategies, $21,755; acquisition of a blighted property, $98,051; rehabilitation of a blighted rental unit, $25,000; demolition of a city-owned blighted property, $40,570; and code enforcement activities to address blighted properties, $800.

A lack of staff capacity to oversee or participate in the combination of these major initiatives plus new housing construction projects, CDBG and NSP housing rehabilitation projects, public facility rehabilitation, and monitoring public service programs has continued the City's recent trend for lower than anticipated outcomes. The City has increased capacity through additional staffing and contracting for specific services, which is expected to improve performance in the 2018/19 PY. The City will continue to look at additional staffing needs required to administer new development programs within the Planning Department.

Comparison of the proposed versus actual outcomes for each outcome measure submitted with the consolidated plan and explain, if applicable, why progress was not made toward meeting goals and objectives. 91.520(g)

The tables on the following pages provide comparisons of expected versus actual outcomes accomplished during the 2017/18 PY. The City exceeded expectations in the four categories summarized below:

Tenant Rental Assistance/Rapid Re-housing: St. Vincent de Paul slightly exceeded expected performance of 130 individuals by serving 137 through the Reducing Medford Homelessness in 2017 program. The individuals served are members of 63 households which was slightly short of the estimated 70. Anticipated performance is always an estimate based on previous years.

Homeless Prevention: The City, through estimations provided by Hearts with a Mission, Maslow Project, Center for Nonprofit Legal Services and St. Vincent de Paul, anticipated serving 1,648 individuals with services that seek to end or prevent homelessness. The actual number served in this category was 2,021; or 123% of the expectation. This variance is attributed to estimations made prior to the start of the program year.

Public Service Activities other than LMI Housing Benefit: Overall, the City served 1,930 citizens through CDBG funds not specifically targeted to a housing benefit. Four subrecipients produced an overperformance of 320, or 120%. The combined CDBG expenditure was $51,810. This is mainly attributed to performance estimation during the grant application process. Maslow Project expected to serve 1,350 versus an actual of 1,732; Community Volunteer Network's Foster Grandparent program 32 versus 33; Center for Nonprofit Legal Services' Fair Housing program 28 versus 41; and Consumer Credit Counseling's Credit Report and Budgeting program 200 versus 124.

Public Facility and Infrastructure Activities other than LMI Housing Benefit: The City had $366,672 in available resources for this category, of which $235,267.25, or 64% was expended. Projects that fully expended and met or exceeded HUD reported anticipated performance included the Public Works Neighborhood Infrastructure project, Jackson Park ADA Upgrade, Union Park ADA Upgrade and demolition of City-owned 1615 Thomas Road. The City exceeded performance of public infrastructure and parks development projects with an expected 2,376 households versus an actual amount of 6,585. This resulted from an underestimation of eligible households living in the impacted neighborhoods. HUD's ArcGis mapping tool identified 5,609 additional households in all four block groups/tracts. The City met expectations in the demolition of blight category with one completed property at 1615 Thomas Road.

Categories that did not meet anticipated performance outcomes are summarized below:

Public Facility Improvements: The Medford Senior Center (MSC) facility improvement project was carried forward to the 2018 PY because of delays during the procurement process. Construction began in September 2018 and is expected for completion by the end of the year. The originally estimated 1,200 membership will most likely be adjusted to approximately 400 given a more accurate member tracking system implemented by the City Parks and Recreation Department. MSC expended $13,754 of the awarded $118,070 during the program year to pay for environmental studies and architectural design. The City will report performance in the 2018 CAPER.

The Children's Advocacy Center was originally awarded $21,300 for the completion of an entry porch repair project that would also bring the facility up to ADA standards. This project was delayed because of City staff capacity with completing the environmental review. The City contracted with Camas Consulting to conduct the environmental review and bring the project back on track for completion in the 2018 PY second quarter. This project contract value was increased by $2,500 to cover environmental review costs. Performance will be reported in the 2018 CAPER.

Public Infrastructure Activities for LMI Housing Benefit: The City was not able to meet its targeted goal of 151 housing units produced or benefitted through public infrastructure funding which involved two projects with Housing Authority of Jackson County (HAJC). The agency's 2017 project to modernize the 87-unit complex at 726 Royal Street was finished during the program year using $48,975 in CDBG funds. However, the agency's 64-unit new construction rental project on Ross Lane was not able to begin because of delays with environmental issues associated with adjacent orchard and flood plain mitigation requirements. This project was issued a Notice to Proceed from the City in October 2018. Off-site construction will begin in November 2018.

Affordable Housing Added: Habitat for Humanity's (HfH) acquisition for construction of three new homeowner units experienced delays associated with the substantial amendment process after HfH requested an expanded scope from acquisition/rehabilitation of one blighted unit to acquisition/demolition/construction. The project suffered additional delays when a leaking underground storage tank (LUST) was discovered at a site upgradient to the property during the environmental review process. Both issues have since been resolved and the project is back on track.

Homeowner Housing Rehabilitated: The City's completion of existing homeowner rehabilitations fell short because of a greater than expected return of program income during the 2016 and 2017 program years, higher average construction costs per home than expected and a shortage of construction labor. The Homeowner Repair Program, administered by HAJC, completed 13 of the 22 anticipated home repairs during the 2017 PY. Like stated above, the anticipated amount was not achieved due to increasing construction costs and the extensive nature of the 13 repairs, including two large projects that began in the 2016 PY year but were not completed as of the year's end.

Rental Housing Rehabilitated: PeopleFirst Properties encountered a delay with securing contractors that could complete rehabilitation of one rental unit at 128 Chestnut Street on time and within budget. This carried completion to September 2018. The unit is now rented to First Presbyterian

Church for the benefit of three individuals recovering from addiction. Performance will be reported in the 2018 CAPER.

Code Violations Resolved: The City addressed four of the proposed seven blighted properties through Code Enforcement activities utilizing $800 in carry-forward CDBG funds. Inter-departmental collaborations with Building Safety, Code Enforcement, Planning, and Legal resulted in the resolution of an additional 70 units through the work of the Receivership Program, Neighborhood Livability Partnership, public-private partnerships and other CDBG and NSP rehabilitation projects. Given the complexity of this process and limited staff capacity, a conservative approach to expending CDBG funds has been taken during the past two program years. However, improved understanding of the system and increased staffing capacity is expected to elevate performance in the next program year.

The City expects to meet or exceed all but two of the expected performance categories within the 2015-19 Consolidated Plan period as illustrated on page 6, Table 2. The only exception is **Buildings Demolished**. During the consolidated planning process, the City's consultant took an aggressive approach when estimating 27 expected buildings. This was mainly due to the large original investment of over $150,000 during the 2015/16 PY, with seven properties expected in the first year and five each year thereafter. Given the legal complexities associated with this type of activity, City staff took a more conservative approach to expending CDBG funds until a consistent system was developed. Although performance will technically fall short as recorded, the City is extremely pleased with the progress made to address problem properties through the variety of tools referenced in the previous paragraph.

The other area of Consolidated Plan shortfall will be with **Homeless Person Overnight Shelter** due to a misestimation made by Hearts with a Mission during the 2015/16 PY. The agency estimated 375 persons annually but included family members of the youth served through the city's only emergency youth shelter. Since then, City staff has worked with the agency to adjust annual performance estimations resting at 100-150 sheltered youth, annually.

Table 1 - Accomplishments – 2017/18 Program Year

Goal	Description	Indicator	Expected Outcome	Actual Outcome	Unit of Measure	Percent Complete
1	Affordable Housing - *Objective 1*	**Homeowner Housing Rehabilitated** - Homeowner Repair 2016 (5) - Homeowner Repair 2017 (8)	22	13	Housing Units	59%
1	Affordable Housing - *Objective 1*	**Rental Housing Rehabilitated** - PeopleFirst Properties (0)	1	0	Housing Units	0%
1	Affordable Housing - *Objective 2*	**Public Facility/Infrastructure Activities for LMI Housing Benefit** - Housing Authority Royal Apartments (87) - Housing Authority Newbridge (0)	151	87	Households	57.6%
		Homeowner Housing Added - Habitat for Humanity 1026 W 10th Street (0)	3	0	Housing Units	0%
		Tenant Rental Assistance/Rapid Rehousing - St. Vincent de Paul (137)	130	137	Household	105%
		Homeless Person Overnight Shelter - Hearts with a Mission	140	111	Persons	79%
		Homeless Prevention - Hearts with a Mission (111) - Maslow Project (1,732) - Center for Nonprofit Legal Services (41) - St Vincent de Paul (137)	1,648	2,021	Persons	123%
2	Public Services - *Objective 1*	**Public Service Activities other than LMI Housing Benefit** - Maslow Project (1,732) - Community Volunteer Network (33) - Center for Nonprofit Legal Services (41) - Consumer Credit Counseling (124)	1,610	1,930	Persons	120%
3	Community Development (Non-Housing) - *Objective 1*	**Public Facility or Infrastructure Activities other than LMI Housing Benefit** - Medford Senior Center (0) - City Neighborhood Sidewalks (4,230) - City Jackson Park (1,250) - City Union Park (1,105) - Children's Advocacy Center (0)	2,376	6,585	Persons/ Households	277%
		Buildings Demolished - City 1615 Thomas Road	1	1	Buildings/ Structures	100%
		Code Violations Resolved - City Interdepartmental	7	4	Properties	57%

Table 2 - Strategic Plan to Date (2015-19 Consolidated Plan)

Goal	Description	5-Year Funding	Indicator	Expected Outcome	Actual Outcome	Unit of Measure	Percent Complete
1	**Affordable Housing - *Objective 1***	$1,000,000	Homeowner Housing Rehabilitated	76	41	Housing Units	54%
			Rental Housing Rehabilitated *(not in ConPlan)*	1	0	Housing Units	0%
1	**Affordable Housing - *Objective 2***	$35,000	Public Facility or Infrastructure Activities for LMI Housing	50	136	Households	272%
			Homeowner Housing Added	3	2	Housing Units	N/A **Not listed in ConPlan*
			Tenant-based Rental Assistance/Rapid Rehousing	7	91	Households **Listed as persons in Action Plan*	1,300%
			Homeless Person Overnight Shelter	1,875	355	Persons	19%
			Homeless Prevention	1,614	3,709	Persons	N/A **Not listed in ConPlan*
2	**Public Services - *Objective 1***	$434,025	Public service activities other than LMI Housing Benefit	7,166	7,736	Persons	108%
3	**Community Development - *Objective 1***	$2,056,280	Public Facility/ Infrastructure other than LMI Housing Benefit	6,030	8,635	Persons	143%
			Buildings Demolished	27	5	Buildings/ Structures	19%
			Code Violations Resolved	0	15	Properties	N/A **Not listed in ConPlan*

Assess how the jurisdiction's use of funds, particularly CDBG, addresses the priorities and specific objectives identified in the plan, giving special attention to the highest priority activities identified.

The City of Medford's Consolidated Plan and Action Plan call for CDBG investments to accomplish three goals. The goals and accomplishments made during the 2017/18 PY are referenced below:

Goal 1) Improve the Condition and Availability of Affordable Housing.

Under the 2015-19 Consolidated Plan, the City allows for the use of several strategies to improve and maintain existing housing and to create more opportunities for LMI residents to secure affordable and livable housing. Strategies incorporated during the 2017 PY included no-interest loans for rehabilitation, financial assistance for rent payments and deposits, financial assistance for property acquisition, support for programs that help homeless transition to permanent supportive housing, and funding for the completion of a housing strategy study to help reduce barriers to affordable housing.

Major, Minor and Emergency Homeowner Repair: The City, through its Homeowner Repair Program administered by HAJC, expended $334,362 in 2016 and 2017 entitlement funds to provide zero-interest, deferred loans to 13 LMI homeowners in need of rehabilitation to correct hazards and conditions affecting health and affordability. Five homes were improved to meet an Energy Star rating, 12 were brought from substandard to standard condition, three were made ADA accessible, and six owners were senior citizens. Activities included repairing roofs, failing heating and plumbing systems, unsafe wiring, weatherization and other minor emergency repairs. Given Medford's high percentage of aged housing stock, the City continues to prioritize this program to maintain decent and affordable housing for existing homeowners.

Rental Housing Infrastructure Repair: Although not specifically identified as a strategy under Goal 1, HAJC completed a parking lot improvement project at the Royal Apartments affordable housing complex that provides 87 rental units. Tenants were dealing with limited accessibility and parking during the wet months due to failing water lines and insufficient catch basins. Spending $48,974.92 on this project will improve the living conditions and safety of one of the city's oldest and largest existing affordable rental complexes.

Homeless Person Overnight Shelter: The City has supported Hearts with a Mission, the city's only youth emergency homeless shelter, for all three years of the consolidated plan period. In 2017, the agency received $17,951 to support operations that served 111 unduplicated youth.

Homeless Prevention: The City addressed homelessness by supporting five agencies with a combined $74,857 of which included: 1) St. Vincent de Paul's rental assistance program with $20,903 to serve 63 households consisting of 82 adults and 55 children; 2) Hearts with a Mission's Emergency Youth Homeless Shelter with $17,951 to serve 111 youth; 3) Maslow Project's Wrap-Around Case Management program with $22,440 to serve 1,732 youth and family members; and 4) Center for Nonprofit Legal Services with $13,563 to serve 41 participants with fair housing legal assistance.

Affordable Housing Property Acquisition: HfH acquired 1026 W. 10th Street to build three new townhouse style units serving homebuyers ≤ 80% AMI. Total project cost to date is $117,157 including CDBG contributions of $98,051. Demolition and construction will begin in the 2018 PY.

Goal 2) Improve the Ability of Low/Moderate-Income and Special Needs Populations to Become Self-Sustaining.

As in past program years, City Council granted the full HUD allowable CDBG public service allocation of $94,444 to six nonprofits addressing priority needs including homeless prevention services; rapid re-housing assistance; emergency shelter services; senior and youth services; fair housing education and legal services; and counseling services to improve financial health. Overall, these agencies collectively served 2,178 individuals with public services aimed at increasing self-sufficiency.

In addition to the four agencies referenced above as providing services to directly or indirectly address homelessness, the City provided a combined $14,793 to two programs offering services to help participants become or remain self-sustaining. Consumer Credit Counseling Service of Southern Oregon expended $4,620 to serve 124 residents with credit report counseling sessions to discuss their debts, judgements, score and financial situations. Community Volunteer Network expended $10,172 to administratively support the Foster Grandparent Program which placed 33 volunteer seniors in local elementary schools and child care facilities to provide mentorship to youngsters at various stages of development.

Goal 3) Improve Living Conditions by Addressing Community Development Projects that Improve Public Infrastructure, Public Facilities, and Neighborhood Revitalization.

Annual strategies incorporated during the year that resulted in accomplishments under Goal 3 included: provide assistance to repair and improve public infrastructure; provide assistance to develop neighborhood parks; support the removal of dilapidated structures; and actively enforce City codes to improve habitability and safety of housing and eliminate blight.

Public Infrastructure: The City Public Works Department installed 2,100 linear feet of new 5 foot wide sidewalks in neighborhoods serving Washington and Howard elementary schools. In addition, 16 driveway approaches were installed, 665 curb and gutters, 252 feet of 3 foot wide drainage pipe, nine ADA ramps and 48 linear feet of retaining wall. The City expended $136,643.07 from 2015 PY entitlement funds during the program year. According to HUD's ArcGis mapping tool, a total of 4,230 households will benefit from these improvements across two block groups.

As mentioned under Goal 1, HAJC completed a parking lot infrastructure project at 726 Royal Avenue under HUD's matrix code Public Housing Modernization. The 87 residing tenants will benefit from improved accessibility and safety through the installation of three catch basins to allow storm water runoff and debris to be caught and to prevent future flooding; and the replacement of water lines.

Neighborhood Parks: The City Parks and Recreation Department upgraded two LMA neighborhood parks. Union Park was awarded $8,500 to install three ADA ramps, two picnic tables and a disc swing. The number of LMA families expected to benefit from this project, according to the HUD's ArcGIS

mapping tool, is 1,105. Jackson Park received $32,500 to install four ADA compliant picnic tables, three ramps, and one drinking fountain. An ADA pathway was also constructed for improved accessibility and connectivity. These park improvements are expected to directly serve approximately 2,350 of Medford's LMA families.

Dilapidated Structures: As referenced in CR-05, the City met its goal of demolishing one blighted property by expending $40,570 to take down City-owned 1615 Thomas Road. Prior to demolition, the property imposed a neighborhood safety risk as well as opposed Council's five-year priority of ridding the community of blight.

Enforce City Codes: The City addressed four property code violations through Code Enforcement activities. Of the $6,089 available, $800 was spent on property title searches. The remaining project funds will be carried forward to the 2018 and 2019 program years to address additional properties.

CR-10 - Racial and Ethnic Composition of Families Assisted 91.520(a)

Describe the families assisted (including the racial and ethnic status of families assisted).

Table 3 – Assistance to Racial and Ethnic Populations by Source of Funds

	CDBG
White	1,911
Black or African American	99
Asian	12
American Indian or American Native	73
Native Hawaiian or Other Pacific Islander	49
Total	2,144
Hispanic/Latino	655
Not Hispanic/Latino	1,492

Narrative

During the 2017/18 PY a total of 2,278 people were assisted through public service agencies and housing related projects funded by the City's CDBG program to offer youth services, senior volunteer opportunities, emergency rental assistance, budgeting and credit report services, and legal aid and education. The number in Table 3 reflects those identifying as a **single race only**. The total of single race beneficiaries was 2,144, of whom 655, or 30.5% were Hispanic. An additional 134 mixed-race individuals were also served through these programs, which are not reported in the IDIS-generated, non-editable table above. Within these additional 134 beneficiaries, 42, or 31%, were Hispanic.

Included in the table is race and ethnicity data for 100 beneficiaries of housing related projects through the City's CDBG Homeowner Repair Program and rental property public housing modernization project, both through HAJC. A total of 13 households benefitted from homeowner rehabilitation opportunities, 100% of whom were White, Non-Hispanic. Of the remaining 87 tenant household beneficiaries, all reported as **single race only** with 82 White, 3 Black/African American, 1

American Indian/Alaskan Native, and 1 Native Hawaiian/Other Pacific Islander. Fourteen (14) or 16% of this subpopulation identity as Hispanic/Latino.

CR-15 - Resources and Investments 91.520(a)

Identify the resources made available

Table 4 – Resources Made Available

Source	Resources Made Available	Amount Expended During Program Year	Remaining Resources
2017 Entitlement	629,629.00	367,003.80	262,625.20
2016 Entitlement	396,574.37	169,898.10	226,676.56
2015 Entitlement	183,272.07	183,272.07	0.00
Pre-2015 Entitlement	154,799.58	65,630.50	89,169.08
Program Income	234,608.71	190,035.42	44,573.29
TOTAL RESOURCES:	**$1,598,883.73**	**$975,839.89**	**$623,043.13**

Narrative

Resources made available and amounts expended during the 2017/18 PY were drawn from HUD's Integrated Disbursement and Information System (IDIS). Amounts are broken down by program year as associated with each project/program active during the reporting year. These amounts have been verified by CDBG and Finance Department staff based on actual IDIS drawdown voucher numbers and other reports available in IDIS. The CDBG program year runs July 1 through June 30. The HUD PR26, CDBG Financial Summary, illustrated in Appendix A reflects adjustments for drawdowns that were processed outside of the 90-day grace period following the program year end of June 30, 2018. The PR26 includes line details for the 2017/18 PY as well as for transactions that recorded after the 90-day grace period into the 2018/19 PY.

Identify the geographic distribution and location of investments

The City of Medford did not utilize target areas for distribution of CDBG funds under the 2017/18 Action Plan. However, the chart below illustrates actual percentages of the allocation of expended CDBG funds excluding program administration during the 2017/18 PY.

Table 5 – Geographic Distribution and Location of Investments

Target Area	Planned Percentage of Allocation	Actual Percentage of Allocation	Narrative Description
CDBG Eligible Block Groups	N/A	20.98%	Eligible Census Tract/Block Benefit
Citywide	N/A	74.25%	LMI Individual Benefit
Citywide – Spot Blight	N/A	4.77%	Benefit Areas on a Spot Blight Basis

Narrative

Citywide Spot Blight is not showing in IDIS as a separate category, but staff is working with the IDIS help desk for clarification. The City Thomas Road Demolition project, expending $40,570.22 of the total 2017 PY project expenditures of $850,494.14 (excluding Program Administration) accounted for 4.77% of the geographic distribution.

Leveraging

Explain how federal funds leveraged additional resources (private, state and local funds), including a description of how matching requirements were satisfied, as well as how any publicly owned land or property located within the jurisdiction that were used to address the needs identified in the plan.

The City strongly encourages a leverage component among CDBG subrecipients. Annual applications proposing leverage funds typically score more favorably through the competitive rating system. The City identifies leverage funds through its program administration reporting component. Leverage sources during the 2017/18 PY included foundations, other federal, other state/local, private contributions, and program fees or dues. Excluding program administration funds, projects and programs expending CDBG dollars during the year, whether the project was completed during the year or not, expended $850,494.14. These projects provided a combined expended leverage of $2,886,565. Among the leverage sources, foundations accounted for 14.91% of the total leverage; other federal funds, 10.16%; other state or local, 25.39%; private contributions, 39.28%; and program fees or dues, 10.26%.

CR-20 - Affordable Housing 91.520(b)

Evaluation of the jurisdiction's progress in providing affordable housing, including the number and types of families served, the number of extremely low-income, low-income, moderate-income, and middle-income persons served.

Table 6 – Households Provided Affordable Housing Units

	One-Year Goal	Actual
Number of Homeless households to be provided affordable housing units	0	0
Number of Non-Homeless households to be provided affordable housing units	68	0
Number of Special-Needs households to be provided affordable housing units	12	0
Total	**80**	**0**

Table 7 – Households Provided Affordable Housing Support

	One-Year Goal	Actual
Number of households supported through rental assistance	70	63
Number of households supported through the production of new units	67	0
Number of households supported through rehab of existing units	19	13
Number of households supported through acquisition of existing units	3	0
Total	**159**	**76**

Discuss the difference between goals and outcomes and problems encountered in meeting these goals.

As per HUD clarification, Table 6 should include production of new housing units, **only**. This was confirmed during completion of the 2016/17 CAPER when staff discovered IDIS data entries also included expectations related to affordable housing support services.

Number of homeless households to be provided affordable housing units: The City has not received any applications for projects to produce permanent housing for homeless households during this consolidated plan period. However, given heightened regional awareness and increasingly available financial resources, the City anticipates requests in subsequent program years.

Number of non-homeless households to be provided affordable housing units: The City was not able to accomplish its goal of 68 units for non-homeless households due to environmental and construction delays of three projects. Explanations are provided below.

HAJC will begin construction of 64-unit Newbridge Place during the 2018 PY with a completion in the 2019 PY. This project experienced a lengthy delay in receiving Notice to Proceed because of environmental issues associated with adjacent orchard mitigation and FEMA approval of a CLOMR. These issues have since been resolved and offsite construction will begin in October 2018.

HfH acquired the existing unit at 1026 W 10th Street in July 2017 and went through the substantial amendment process to convert the property to three new homebuyer units in May 2018. This project also experienced lengthy environmental delays when a LUST was discovered at an upgradient elementary school site. This issue was resolved in October 2018 and the project is now back on track with completion anticipated during the 2019 PY.

PeopleFirst Properties encountered a delay with securing contractors that could complete the rehabilitation of one rental unit at 128 Chestnut Street on-time and within budget. This carried completion to September 2018. The unit is now rented to First Presbyterian Church for the benefit of three individuals recovering from addiction.

Number of special-needs households to be provided affordable housing units: The 12 units expected to serve special-needs households are associated with the 68 units referenced above. This estimation will be finalized after occupancy is recorded for each project.

The above narrative also relates to shortfalls reported in Table 7 under production of new units and acquisition of existing units. Please see explanations below for the other two categories:

Number of houses supported through Rental Assistance: As illustrated in Table 7, rental assistance performance fell short by seven households. However, performance exceeded by this same number when tracking individual members of households as illustrated in Table 1. Both variances are attributed to estimation.

Number of households supported through rehab of existing units: The amended 2017/18 Action Plan reported an expected 18 homeowner rehabilitations and one rental rehabilitation. The City fell short on the first mark because HAJC typically uses an average cost of $12,000 per unit when estimating performance outcomes. During the 2017 PY, several of the homes required major rehabilitations which increased the anticipated average. In addition, the cost of construction increased. This accounted for a shortfall of five units. The remaining shortage resulted from a delay in the rehabilitation of 128 Chestnut. Although funds were expended in the 2017 PY, contractors were not finished until the end of September 2018.

Discuss how these outcomes will impact future annual action plans.

Working through barriers to development associated with the environmental review and procurement processes and increasing staffing capacity is expected to positively impact future annual action plans. Better systems and delegation are in place for more efficient performance estimation and project management.

Include the number of extremely low-income, low-income, and moderate-income persons served by each activity where information on income by family size is required to determine the eligibility of the activity.

Table 8 – Extremely Low- and Low-Income Persons Served

Number of Persons Served	CDBG Actual	HOME Actual
Extremely Low-income	153	**n/a**
Low-income	99	**n/a**
Moderate-income	194	**n/a**
Total	**446**	**n/a**

Narrative Information

Agencies contributing to the numbers above include Community Volunteer Network, Center for Nonprofit Legal Services, Consumer Credit Counseling, St. Vincent de Paul and HAJC. As reflected in Table 7, 43.5% of those served earned a moderate income (≤ 80%), 34.3% earned an extremely low income (≤30%) and 22.2% earned a low income (≤50%).

CR-25 - Homeless and Other Special Needs 91.220(d, e); 91.320(d, e); 91.520(c)

Evaluate the jurisdiction's progress in meeting its specific objectives for reducing and ending homelessness through:

Reaching out to homeless persons (especially unsheltered persons) and assessing their individual needs.

During the 2017/18 PY, the City awarded $75,872, or 80.3%, of the allowable CDBG public service allocation of $94,444 to four agencies with an objective of reaching out to homeless persons. Supporting St. Vincent de Paul, Maslow Project, Hearts with a Mission and Center for Nonprofit Legal Services helped the City achieve performance outcomes by collectively serving 2,021 individuals.

St. Vincent de Paul's Reducing Medford Homelessness program provided rent deposits and monthly rent subsidies to families and individuals that were homeless or at risk of becoming or returning to homelessness. CDBG funds of $20,903.41 served 63 families consisting of 82 adults and 55 children. Beneficiaries included 45 persons that were homeless at the time of service, 36 female heads of household, 34 persons with disabilities and 18 senior citizens. St. Vincent de Paul is an all-volunteer organization dedicated to providing compassionate support and care to those persons experiencing or at risk of homelessness. Other services included: emergency family shelter, lunches, groceries, health screenings, emergency dental care, showers, laundry, haircuts and mail boxes.

Maslow Project's Wrap-Around Supportive Services for Homeless Youth and Families program was awarded $22,440 to supplement a portion of staffing expenses to serve 1,732 unduplicated eligible clients through the Medford Resource Center. Of these clients, 1,279 were reported homeless when they entered the program, and the remaining 453 were at extreme risk for homelessness or on a six-month exit-plan after being housed. Services included street outreach, food services, case management, and connections to other services. Other services included: SNAP benefits; children's dental clinic; crisis intervention counseling; harm reduction and life skills; tutoring and mentoring; transitional services designed to find housing, pursue continuing education, or seek employment opportunities; and connection to adult role models and mentors. Of the 1,732 served through CDBG, 920 were female heads of household, 161 were persons with disabilities and one was a senior citizen.

Hearts with a Mission's Shelter and Safety Net Services program received $17,951 to provide shelter, case management, counseling and educational support to 111 unduplicated youth. Combined, these youth benefitted from a total of 5,728 nights of safe sheltering and approximately 17,170 healthy meals and snacks. The City's CDBG award expanded their services to include additional support for families of the youth they serve through a community outreach effort. The project administered a variety of safety net services that addressed immediate basic needs, decreased at-risk behaviors, prevented abuse (or provided treatment to victims of abuse) and removed barriers to academic/employment success. Other services included family reunification and/or matching youth with host families. Among the 111 served through the CDBG program, 72 were female heads of household.

Center for Nonprofit Legal Services' (CFNPLS) Furthering Fair Housing program was awarded $13,563 to cover legal staffing costs associated with outreach and legal education to protected classes. Among the 41 served, six were homeless at the time of service and 35 requested services to avoid homelessness. Services included representation before termination of Section 8 benefits, legal counsel to pursue withholding rent to effect repairs, representation of those receiving cause termination notices, aiding in reasonable accommodation requests and providing legal advice to help maintain eviction-free records. CFNPLS participated in the annual homeless outreach event (Project Community Connect) with the purpose of providing legal services to those experiencing or at risk of homelessness in Jackson County.

Outside of CDBG funding, the City assumed a crucial role in strengthening the CoC to target the housing and support needs of chronically homeless. During the 2017 CDBG grant competition, the Housing and Community Development Commission awarded bonus points to applications that proposed projects or programs in alignment with the CoC and that participated in or established an intention to participate in the Homeless Management Information System (HMIS). Establishing this priority stimulated more agencies to track data through HMIS and also encouraged a functioning Coordinated Entry System (CES). The CoC Coordinator reported an increase in the number of agencies and organizations using HMIS to 15. Also, due to increased collaboration and case conferencing between Veteran and Non-Veteran Housing providers, in one quarter's time, 180 chronically homeless households were removed from the Veterans list and 194 households were removed from the Non-Veterans list. These types of highlights demonstrate the power of a high-functioning CoC.

Addressing the emergency shelter and transitional housing needs of homeless persons.

In coordination with local non-profit agencies the City prepared for the adoption of municipal code language (Ord. 2018-113) to allow for the use of buildings as temporary shelters when managed by a non-profit, church, government agency or similar agency. The adoption was recommended on June 14, 2018 by the City's Planning Commission. Temporary shelters, as defined in Code, are a temporary shelter within a building for 90 days (with an allowance for extension to a total of 180 days) in a year; the intent of the shelter use is to allow organizations to create a shelter for short-term use to allow for relief from extreme weather conditions for the homeless and other disadvantaged populations in Medford. The adopted language has a prescriptive process for organizations to follow and guarantees certain land use rights for operators of temporary shelters who are approved through said process.

The City worked closely with Rogue Retreat to refine operations of the Kelly Shelter during its second year of operation of January 2018 through March 2018. Significant changes included: 1) operating more like a transitional shelter; 2) replacing volunteers with 24/7 paid staff including a designated shelter case; 3) developing a discharge system to move residents to permanent housing; 4) coordinating with local churches during the day to serve as day centers; and 5) participating in HMIS/CES. The Shelter provided warmth and safety to 131 (100 men, 31 women) chronically homeless guests (17 Veterans) and successfully assisted 40 guests to transition into more permanent housing situations. The Kelly Shelter provided 13,650 meals, helped 41 people get signed up for OHP, assisted four guests successfully enroll in college, assisted five guests with Domestic Violence Assistance and assisted one guest with obtaining immigration papers.

Helping low-income individuals and families avoid becoming homeless, especially extremely low-income individuals and families and those who are: likely to become homeless after being discharged from publicly funded institutions and systems of care (such as health care facilities, mental health facilities, foster care and other youth facilities, and corrections programs and institutions); and, receiving assistance from public or private agencies that address housing, health, social services, employment, education, or youth needs.

Six public service agencies collectively expended $90,665, serving 2,178, targeting low-to moderate-income individuals and families at risk of becoming homeless. Services provided by St. Vincent de Paul, Maslow Project, Hearts with a Mission and Center for Nonprofit Legal Services were summarized in the previous section. Consumer Credit Counseling Services of Southern Oregon and Community Volunteer Network joined this initiative by providing unique, one-of-a-kind services.

Consumer Credit Counseling Service was awarded $7,480 to fund the Credit Report Counseling for the Low-Income Community Members program. Funding was allocated to cover staffing costs and credit reports to provide counseling sessions on repairing credit scores, managing debt, addressing judgements, and implementing a personal budget. The agency expended $4,620 to serve 124 persons, of which one identified as homeless.

Community Volunteer Network was awarded $10,172 to cover administrative costs associated with the Foster Grandparent program. This program is a unique program connecting volunteer senior citizens with youth in need of mentorship at local elementary schools and child care organizations. Thirty-three seniors participated in the program, many of which accepted a small stipend that often helps secure or sustain income and/or manage personal budgets to maintain housing.

Additional performance data for each subrecipient is listed below:

St. Vincent de Paul: Among the 137 persons served, 45 transitioned from homelessness to permanent housing and 92 were helped from becoming homeless. Thirty-six were female head of household, 34 persons with disabilities and 18 were seniors.

Maslow Project: Of the 1,732 youth and family members served, 1,279 were either homeless or at risk of homelessness after being discharged from foster care, corrections programs or other youth facilities. Among the homeless, 190 were connected with temporary shelter or permanent housing. Nine hundred twenty were female head of household, 161 reported a disability, and one was a senior.

Hearts with a Mission: All 111 youth were homeless and 72 were female head of household. Twenty-one percent were discharged from DHS, 4% from hospitals, 6% from schools, 5% from churches, 15% from family or friends, 21% from other community agencies and 28% were self-referred.

Center for Nonprofit Legal Services: Among the 41 served, 27 were female head of household, 17 were seniors and seven reported a disability.

Helping homeless persons (especially chronically homeless individuals and families, families with children, veterans and their families, and unaccompanied youth) make the transition to permanent housing and independent living, including shortening the period of time that individuals and families experience homelessness, facilitating access for homeless individuals and families to affordable housing units, and preventing individuals and families who were recently homeless from becoming homeless again.

Three of the six public service agencies receiving CDBG Public Service Program funds served homeless persons with services that may impact their ability to transition to permanent housing, the City identified three agencies as providing direct transitional assistance during the 2017/18 PY: 1) Maslow Project placed 82 individuals in shelter or safe temporary housing and 67 in permanent housing; 2) St. Vincent de Paul transitioned 20 families or 45 persons out of homelessness into permanent rental housing; and 3) Hearts with a Mission reunified 104 of the 111 homeless youth served with their families or with a safe alternative.

CR-30 - Public Housing 91.220(h); 91.320(j)

Actions taken to address the needs of public housing.

There are no public housing projects or units of public housing in Medford.

Actions taken to encourage public housing residents to become more involved in management and participate in homeownership.

There are no public housing projects or units of public housing in Medford.

Actions taken to provide assistance to troubled PHAs.

There are no troubled PHAs operating in Medford.

CR-35 - Other Actions 91.220(j)-(k); 91.320(i)-(j)

Actions taken to remove or ameliorate the negative effects of public policies that serve as barriers to affordable housing such as land use controls, tax policies affecting land, zoning ordinances, building codes, fees and charges, growth limitations, and policies affecting the return on residential investment. 91.220 (j); 91.320 (i)

Medford has become a more collaborative, solutions-based community. The following are examples of City actions taken during the 2017/18 PY to address barriers to affordable housing:

1) In the fall 2017 the City developed a Housing Advisory Committee (HAC) to carry out the commitment of Medford to complete a housing strategy by March 2018. The HAC was tasked with recommending strategies to remove cost barriers to the development of affordable housing for low- to moderate-income households. With this recommendation the HAC reviewed 21 economic incentives and 20 regulatory policy reform options. A few of the high priority strategies included Construction Excise Tax, Multi-unit Property Tax Exemption, establishment of a permanent Housing Advisory Committee, creation of clear residential design standards, revaluating the City's residential zones, incentives for development of Accessory Dwelling Units and allowance for cottage housing.

2) Jackson County Board of Commissioners adopted Ordinance No. 2017-11 on August 2, 2017, approving a Major Comprehensive Plan Amendment to add approximately 4,046 acres to the City of Medford Urban Growth Boundary (UGB) including the City's changes that were enacted by Council Bill 2016-99. On September 7, 2017, the City Council approved Ordinance No. 2017-102, adopting revisions to the UGB Amendment to align the City's and County's findings of fact, conclusion of law, and record of proceedings. Both ordinances addressed newly available land supply and density maximums that limit the number of units buildable on a given parcel of land.

3) City Council approved the Affordable Housing Construction Excise Tax on February 15, 2018, authorizing the City to collect a tax of one-third of one percent of the improvement value on building permits for residential, commercial, and industrial improvements to provide funding for affordable housing in the city of Medford. This action will provide a dedicated funding source of approximately $500,000 annually (based on a 10-year historic analysis) that is likely to benefit smaller builders and developers. This action may also provide a continued funding source for construction projects through economic downturns.

Actions taken to address obstacles to meeting underserved needs. 91.220(k); 91.320(j)

1) On June 21, 2018 the City Council adopted ordinance No. 2018-73, which established the creation of the Community Development Grants Commission (CDGC). The CDGC, as defined by code, is tasked with acting as an advisor to the City Council on the appropriate implementation of the City's CDBG program, General Fund Grant Program and related programs and statutory responsibilities. The commission is also responsible for addressing the

obstacles to meeting underserved needs by being responsible for administering the CDBG grant selection process, implementing the CDBG Citizen Participation Plan, overseeing General Fund Grant reporting, and working with the Housing Advisory Commission in implementing the City's Consolidated Plan, Annual Action Plan, and Analysis of Impediments to Fair Housing Choice.

In order to maintain outreach to the needs of all those underserved, the commission's voting members are comprised of various community members including one current member of the Budget Committee, one member representing healthcare, one member representing social services, one member representing local business, one member representing workforce development, one member representing an educational institution, one member representing affordable housing and two members-at-large encouraging representation from throughout the whole community. The holistic approach was designed to have representation from multiple areas that directly interact with meeting underserved needs. This commission will also work directly with the Housing Advisory Commission to help prioritize the affordable housing needs of underserved residents of Medford.

2) During the previous program year, Council designated a portion of City-owned property at 821 N. Columbus Avenue as a campground to provide transitional housing accommodations under the terms of ORS 446.265. Council also approved a contract with Rogue Retreat to manage the transitional housing campground referred to as Hope Village. On July 5, 2018, under Resolution 2018-83, Council extended that contract for two years and allowed for the addition of 16 units (eight duplexes).

Actions taken to reduce lead-based paint hazards. 91.220(k); 91.320(j)

The City's Five-Year Consolidated Plan identified an extensive need for rehabilitation programs in Medford targeting the improvement of the City's oldest housing stock. Consolidated planning data directed attention to the 51% of owner housing and 52% of rental housing built prior to 1980 as potential lead-based paint hazards. Data also concluded 13% of owner housing units and 7% of rental units built prior to 1980 are occupied by families with children; a combined 3,100 units. The City has remained committed to addressing this issue since 1996 through partnership with HAJC, the administrative agency for the City's Homeowner Repair Program. Since inception, the program has rehabilitated approximately 440 homes. Among the 13 homes rehabilitated in the 2017 PY, 10 were built prior to 1978. HAJC reported 12 of these homes were in substandard condition prior to rehabilitation, and no projects involved lead disturbance.

During the development of the 2018 Action Plan, City staff contacted Jackson County Health and Human Services and the Environmental Public Health - Center for Health Protection Division of the Oregon Health Authority (OHA) to develop effective partnerships to support the improvement of the housing conditions for Medford citizens. Collaboration began with OHA Environmental Public Health Research Analyst David Dreher, in locating and evaluating pertinent data concentrated in the Medford area. This work narrowed the focus of attention to tenants living in properties built prior to 1950, with the possibility of lead-based paint contamination currently occupied by children under the age of six. During the 2017 PY, OHA confirmed eight cases of hazardous lead exposure in children this

age. City staff also met with OHA Lead Program Coordinator Ryan Barker, based out of Portland, Oregon. Ryan Barker provided specialized education which continued the discussion of the dangers of continued exposure to lead-based paint and dust and the possible lifelong debilitating health issues, the rate and severity of which increase exponentially the earlier in a child's life the exposure begins. OHA sent approximately 300 notification letters and educational materials to property owners and property managers responsible for properties within the City of Medford that are likely to contain lead-based paint and dust. Further collaboration will occur to identify additional responsible parties that should be notified of the likelihood of the presence of lead-based paint and the potential health risks resulting from exposure. Because of 2017 research and analysis, the City will launch a 2018-19 search for funding sources to provide education to the community and support abatement of confirmed lead-based paint hazards located in occupied residential properties.

Actions taken to reduce the number of poverty-level families. 91.220(k); 91.320(j)

The City's actions to reduce the number of poverty-level families during the 2017/18 PY primarily consisted of supporting nonprofit agencies providing social services to poverty-level families and improving the availability and affordability of housing for homeowners, renters and individuals seeking to transition out of homelessness.

Public Service Availability: Six public service agencies receiving CDBG support during the 2017/18 PY worked to reduce the immediate and/or future poverty-level of those served. Families received assistance with foreclosure/eviction prevention, rental preparedness and fair housing awareness, senior advocacy, family reunification, safety net services, referral services, education attainment, food, comprehensive case-management, mentorship, transition out of homelessness, credit report repair and personal budgeting, and emergency rental housing assistance. Investing $94,444 (expending $90,665) in public services referenced under CR-05 aided 2,178 families or individuals to help manage or overcome poverty.

Affordability of Owner-Occupied Units: The City's Homeowner Repair Program served 13 LMI homeowners with housing repairs and weatherization assistance that not only allowed them to remain in their homes, but for several will result in a reduction in monthly utilities costs and improved health. Six of these homeowners were seniors on limited and/or declining incomes.

Actions taken to develop institutional structure. 91.220(k); 91.320(j)

Medford residents are fortunate to live in a community that is comprised of a network of social service agencies that work together to develop a comprehensive system for the delivery of support services. The City strives to strengthen this institutional structure on an annual basis through CDBG and the General Fund Grant programs. The City's role in improving institutional capacity during the 2017 PY focused on: 1) continuing to play an integral role in reducing homelessness by funding the new CoC Homeless Coordinator position with $30,000 from the City's General Fund; 2) supporting a new CoC governance structure with the Medford City Manager assuming the role of CoC Board Chair; 3) establishing a new partnership with HAJC where the City has agreed to serve as the Responsible Entity under all environmental laws and authorities to help facilitate development of affordable housing; 4) appointing City staff to serve on the CoC Housing Pipeline Workgroup; 5) providing

technical assistance to agencies including Habitat for Humanity, Hearts with a Mission, Housing Authority of Jackson County, Maslow Project, Center for Nonprofit Legal Services, St. Vincent de Paul, PeopleFirst Properties, Rogue Valley Youth for Christ, Consumer Credit Counseling Services and Compass House to help achieve consolidated plan goals through collaborative community leveraging and project development; and 6) developing relationships with local real estate agencies to help facilitate property acquisitions for development of housing and vocational training.

As indicated previously, Council also established the Community Development Grants Commission (CDGC) to act as an advisor to the Council on the appropriate implementation of the City's CDBG and General Fund Grant programs. The commission will also seek to increase institutional structure through collaboration with local organizations and community members to examine various topics that impact the community.

Actions taken to enhance coordination between public and private housing and social service agencies. 91.220(k); 91.320(j)

In response to community feedback, and to streamline the application and development process of affordable housing projects, City staff developed a pilot program designating one staff member as a liaison between City departments throughout the entire process. This allows subrecipients, developers, builders and involved parties to communicate with one city employee regarding any concerns about the project. The liaison will facilitate communication among departments, share information, report findings, and ensure regulatory compliance. The liaison brings a background of experience working in multiple departments of a municipality and provides and understanding of navigating through the various steps of development. This program will be evaluated during the 2018-19 PY to determine the time commitment and value it provides applicants.

The City successfully cultivated a public-private partnership with PeopleFirst Properties, ACCESS and First Presbyterian Church to convert 128 Chestnut Street to permanent supportive housing for veterans and/or individuals transitioning from addiction. Prior to the partnership, the property was designated as blight. PeopleFirst Properties shares the City's vision to increase fair affordable housing through conversion of the existing blighted inventory. Medford City Council awarded PeopleFirst Properties with $25,000 from an underperforming 2015 CDBG project to rehabilitate the unit for reuse as rental housing. ACCESS leveraged the City's investment with over $16,000 in weatherization funding and agreed to provide rental assistance to a low-income household referred under their Supportive Services for Veteran Families program. City efforts to connect agencies and resources, as well as better engage the faith-based community helped cultivate this new partnership, which ultimately began during 2016 City-sponsored homeless and affordable housing community outreach events.

Identify actions taken to overcome the effects of any impediments identified in the jurisdiction's analysis of impediments to fair housing choice. 91.520(a)

City staff developed a Fair Housing Matrix to appropriately track the progress of overcoming all impediments identified in the City's 2015 Analysis of Impediments. Progress made to address impediments include:

1) *Housing affordability*: The City implemented the Affordable Housing Construction Excise Tax to provide a dedicated funding source for the development of affordable homes and programs. The City also established a relationship with the HAJC where the City will assume the role of Environmental Responsible Entity for properties prerequisite to applying for federal funding.

2) *Increased public awareness of fair housing rights:* The Center for Nonprofit Legal Services expended $13,563 in 2017 CDBG funds to conduct outreach and provide legal education to protected populations about fair housing laws. These funds partially covered attorney's fees to provide civil legal representation to protect affordable, safe and fair housing for Medford's most vulnerable residents. Forty-one Medford residents were served including 27 female heads of household, seven persons with disabilities, 17 seniors and 6 homeless individuals. Along with this, 20 of those served reported earning an income ≤ 30% of the gross AMI, 12 ≤ 50%, and 13 ≤ 80%.

   During the April 5, 2018 City Council meeting, Medford Mayor Wheeler read a proclamation through which he proclaimed April 2018 to be Fair Housing Month as well as the 50th anniversary of the Fair Housing Act.

3) *Increased efficiency of public transportation and mobility*: Rogue Valley Transit District (RVTD) continues to improve transportation options to low income populations. In 2017, Route 25 to southwest Medford was increased to 30-minute service, decreasing wait times for nearby residents and employees.

4) *Impacts of the subprime mortgage lending crisis and increased foreclosures:* The City secured $705,151 in state NSP-1 program income during the 2017/18 PY to purchase and rehabilitation three foreclosed properties located at 2516 Gould Avenue, 915 Newtown and 3024 Timothy Street. HfH, the developer, will qualify two homebuyers earning ≤ 50% AMI and one ≤ 120%.

5) *Predatory lending and other industry practices:* The City funded the Credit Report Counseling Services for Low-Income Community Members Program with intention of exploring lending practices through the expertise and networking capacity of Consumer Credit Counseling. CDBG funds were allocated to run credit reports for LMI individuals working through barriers to obtaining employment and securing housing and transportation. One-hundred twenty-four (124) Medford residents were served with these funds including 51 female heads of household, 21 seniors, and one homeless individual. Fifty-one (51) of those served were ≤ 30% AMI.

6) *Barriers to fair housing impacts on special need populations:* The City maintained annual sponsorship of Southern Oregon Regional Economic Development, Inc. (SOREDI). The City's sponsorship assisted SOREDI in inviting and educating prospective companies that have expressed interest in relocation or expansion opportunities in the Medford area. Their contribution to the community included distributing five business loans, creating 675 jobs with direct SOREDI assistance and conducting outreach to over 150 existing businesses. Their estimated wage impact during the calendar year exceeded 26 million dollars.

7) *Limited resources to assist lower income, elderly and indigent homeowners maintain their homes and stability in neighborhoods*: The 2015-19 Consolidated Plan reports that elderly account for 39.85% of homeowners experiencing housing cost burden >30% and 38.9% of homeowners experiencing burden >50%. Many of Medford's elderly live in aging housing stock and without homeowner assistance may be forced out of substandard housing and into nursing homes. To remedy this, the City funded the Homeowner Repair program. Of the 12 households served, 4 were elderly.

CR-40 - Monitoring 91.220 and 91.230

Describe the standards and procedures used to monitor activities carried out in furtherance of the plan and used to ensure long-term compliance with requirements of the programs involved, including minority business outreach and the comprehensive planning requirements.

Monitoring of all activities funded under the CDBG program is carried out on an ongoing basis by the City's CDBG program administrative staff. Quarterly updates and financial reports are required of all subrecipients who include both public service programs and capital improvement projects receiving CDBG funds. Subrecipients are also required to submit a grantee performance report with each reimbursement request. This report allows staff to monitor expected outcomes with actual program results. The City collects current lists of Board of Directors and notification of single annual audit from all agencies receiving CDBG funding. Audit tracking is maintained to ensure subrecipient's compliance with OMB Circular A-133. All projects are administered under procurement standards governed by OMB Circular A-110 for non-profits and all capital improvement projects adhere to Federal Labor Standards. All records are maintained for a minimum of five years.

During the 2017 PY, onsite monitoring visits were conducted with Medford Senior Center, HAJC and Consumer Credit Counseling. All three projects will carry forward into the 2018 PY. Program eligibility was reviewed, which included but was not limited to beneficiary income verification, review of participant files, program operations, agency policies and procedures, employee and volunteer qualifications, and recordkeeping and accounting practices. No major findings were identified during the monitoring process. City staff has continued to encourage subrecipients to publicly identify and acknowledge the City of Medford and CDBG as a funding source and will be working with the Senior Center to develop a procurement policy.

Citizen Participation Plan 91.105(d); 91.115(d)

Describe the efforts to provide citizens with reasonable notice and an opportunity to comment on performance reports.

The City of Medford developed a Citizen Participation Plan under the 2015-2019 Consolidated Plan to assure citizens are presented with opportunity to provide input and be informed of program performance. During development of the Plan, the City solicited community discussions, collaborative nonprofit agency meetings, and one-on-one discussions with citizens and private businesses to identify community needs, resources and services available, and potential barriers to development. The 2015-19 Consolidated Plan was adopted by Council, under Resolution No. 2015-46, at a public hearing held on May 7, 2015, following a 30-day public comment period.

Notifications of all public comment periods and public hearings associated with the City's CDBG program are advertised in the Mail Tribune, on the City's website and by email to interested parties. Draft documents are made available on the City's website, at the City Recorder's office and the Planning Department.

The Housing and Community Development Commission (HCDC) holds meetings monthly and as deemed necessary will solicit public feedback and formulate recommendations to Council. Minutes of all public meetings held for purposes of planning for the use of CDBG funds, evaluating performance of the program, and soliciting public comments are recorded and maintained through the City Recorder.

Below is a summary of participatory actions related to the 2017/18 PY:

- On May 7, 2015, Council approved Resolution No. 2015-46 adopting the 2015-2019 Consolidated Plan for Housing and Community Development to establish the City's priority needs and goals associated with the use of CDBG funds. This resolution also adopted the 2015/16 Action Plan for use of CDBG funds for the fiscal year 2015-16.

- On June 1, 2017, Council approved Resolution No. 2017-54 adopting the 2017/18 Action Plan for use of CDBG funds for the fiscal year 2017-18 and a Substantial Amendment to the 2016/17 Action Plan to allocate any surplus funds to the Medford Senior Center Facility Improvement project.

- On June 15, 2017, Council approved Resolution No. 2017-57 adopting the budget for the City of Medford for the biennium commencing July 1, 2017.

- On May 3, 2018, Council approved Resolution No. 2018-40 adopting Substantial Amendment No. 1 to the 2017/18 Action Plan to allocate funds to Rogue Valley Youth for Christ for rehabilitation of Fire Station #2 to be used as a youth community center.

- On June 21, 2018, Council approved Resolution 2018-65 adopting Substantial Amendment No. 2 to the 2017/18 Action Plan to expand Habitat for Humanity's scope of 1026 W 10th Street from acquisition for rehabilitation of one unit to new construction of three units.

- On September 20, 2018, Council approved Resolution 2018-112 adopting a fourth Supplemental Budget for the 2017-19 biennium.

- A 15-day public comment period to consider the draft version of the 2017/18 CAPER was opened on October 3, 2018; and extended on October 11, 2018 to conclude on November 1, 2018.

- The HCDC offered the first public meeting on October 17, 2018, to provide opportunity for public comment on the 2017/18 CAPER.

- City staff will present the 2017/18 CAPER under Ordinances and Resolutions at the Council meeting to be held at Medford City Hall, Council Chambers, on Thursday, November 1, 2018, at 6:00 p.m.

CR-45 - CDBG Misc. 91.520(c)

Specify the nature of, and reasons for, any changes in the jurisdiction's program objectives and indications of how the jurisdiction would change its programs as a result of its experiences.

The City's CDBG program objectives were not altered during the 2017/18 PY. Consolidated Plan goals focus on improving and increasing affordable housing, improving access to public services and improving neighborhood conditions. Of the 16 strategies identified in the Consolidated Plan, the following five have not been implemented during the first three years but may be targeted in the final two:

- Provide financial assistance to help potential low/moderate-income homeowners with down payment and closing costs
- Support the creation of higher density, mixed-income and mixed-use housing in the redevelopment of the downtown area
- Support programs that assist low/moderate-income residents to become self-sustaining through job skills training, workforce readiness programs and transportation services
- Support programs that provide loans and technical assistance to small businesses and promote development of mechanisms that will encourage micro-enterprise such as the creation of small business incubators
- Support public services agencies that assist low/moderate-income and special needs populations with safety net services to overcome barriers including mental illness, substance abuse, and physical and mental disabilities

Does this Jurisdiction have any open Brownfields Economic Development Initiative (BEDI) grants?

No.

Appendix A – CDBG Financial Summary (PR26)

Office of Community Planning and Development
U.S. Department of Housing and Urban Development
Integrated Disbursement and Information System
PR26 - CDBG Financial Summary Report
Program Year 2017
MEDFORD , OR

DATE: 10-17-18
TIME: 16:56
PAGE: 1

PART I: SUMMARY OF CDBG RESOURCES	
01 UNEXPENDED CDBG FUNDS AT END OF PREVIOUS PROGRAM YEAR	734,645.74
02 ENTITLEMENT GRANT	629,629.00
03 SURPLUS URBAN RENEWAL	0.00
04 SECTION 108 GUARANTEED LOAN FUNDS	0.00
05 CURRENT YEAR PROGRAM INCOME	234,608.71
05a CURRENT YEAR SECTION 108 PROGRAM INCOME (FOR SI TYPE)	0.00
06 FUNDS RETURNED TO THE LINE-OF-CREDIT	0.00
06a FUNDS RETURNED TO THE LOCAL CDBG ACCOUNT	0.00
07 ADJUSTMENT TO COMPUTE TOTAL AVAILABLE	0.00
08 TOTAL AVAILABLE (SUM, LINES 01-07)	1,598,883.45
PART II: SUMMARY OF CDBG EXPENDITURES	
09 DISBURSEMENTS OTHER THAN SECTION 108 REPAYMENTS AND PLANNING/ADMINISTRATION	670,857.60
10 ADJUSTMENT TO COMPUTE TOTAL AMOUNT SUBJECT TO LOW/MOD BENEFIT	218,269.40
11 AMOUNT SUBJECT TO LOW/MOD BENEFIT (LINE 09 + LINE 10)	889,127.00
12 DISBURSED IN IDIS FOR PLANNING/ADMINISTRATION	86,912.89
13 DISBURSED IN IDIS FOR SECTION 108 REPAYMENTS	0.00
14 ADJUSTMENT TO COMPUTE TOTAL EXPENDITURES	(200.00)
15 TOTAL EXPENDITURES (SUM, LINES 11-14)	975,839.89
16 UNEXPENDED BALANCE (LINE 08 - LINE 15)	623,043.56
PART III: LOWMOD BENEFIT THIS REPORTING PERIOD	
17 EXPENDED FOR LOW/MOD HOUSING IN SPECIAL AREAS	0.00
18 EXPENDED FOR LOW/MOD MULTI-UNIT HOUSING	48,974.92
19 DISBURSED FOR OTHER LOW/MOD ACTIVITIES	616,026.38
20 ADJUSTMENT TO COMPUTE TOTAL LOW/MOD CREDIT	182,092.64
21 TOTAL LOW/MOD CREDIT (SUM, LINES 17-20)	847,093.94
22 PERCENT LOW/MOD CREDIT (LINE 21/LINE 11)	95.27%
LOW/MOD BENEFIT FOR MULTI-YEAR CERTIFICATIONS	
23 PROGRAM YEARS(PY) COVERED IN CERTIFICATION	PY: PY: PY:
24 CUMULATIVE NET EXPENDITURES SUBJECT TO LOW/MOD BENEFIT CALCULATION	0.00
25 CUMULATIVE EXPENDITURES BENEFITING LOW/MOD PERSONS	0.00
26 PERCENT BENEFIT TO LOW/MOD PERSONS (LINE 25/LINE 24)	0.00%
PART IV: PUBLIC SERVICE (PS) CAP CALCULATIONS	
27 DISBURSED IN IDIS FOR PUBLIC SERVICES	60,101.76
28 PS UNLIQUIDATED OBLIGATIONS AT END OF CURRENT PROGRAM YEAR	4,337.97
29 PS UNLIQUIDATED OBLIGATIONS AT END OF PREVIOUS PROGRAM YEAR	0.00
30 ADJUSTMENT TO COMPUTE TOTAL PS OBLIGATIONS	26,225.03
31 TOTAL PS OBLIGATIONS (LINE 27 + LINE 28 - LINE 29 + LINE 30)	90,664.76
32 ENTITLEMENT GRANT	629,629.00
33 PRIOR YEAR PROGRAM INCOME	125,277.00
34 ADJUSTMENT TO COMPUTE TOTAL SUBJECT TO PS CAP	0.00
35 TOTAL SUBJECT TO PS CAP (SUM, LINES 32-34)	754,906.00
36 PERCENT FUNDS OBLIGATED FOR PS ACTIVITIES (LINE 31/LINE 35)	12.01%
PART V: PLANNING AND ADMINISTRATION (PA) CAP	
37 DISBURSED IN IDIS FOR PLANNING/ADMINISTRATION	86,912.89
38 PA UNLIQUIDATED OBLIGATIONS AT END OF CURRENT PROGRAM YEAR	11,642.74
39 PA UNLIQUIDATED OBLIGATIONS AT END OF PREVIOUS PROGRAM YEAR	0.00
40 ADJUSTMENT TO COMPUTE TOTAL PA OBLIGATIONS	26,790.12
41 TOTAL PA OBLIGATIONS (LINE 37 + LINE 38 - LINE 39 +LINE 40)	125,345.75
42 ENTITLEMENT GRANT	629,629.00
43 CURRENT YEAR PROGRAM INCOME	234,608.71
44 ADJUSTMENT TO COMPUTE TOTAL SUBJECT TO PA CAP	0.00
45 TOTAL SUBJECT TO PA CAP (SUM, LINES 42-44)	864,237.71
46 PERCENT FUNDS OBLIGATED FOR PA ACTIVITIES (LINE 41/LINE 45)	14.50%

LINE 17 DETAIL: ACTIVITIES TO CONSIDER IN DETERMINING THE AMOUNT TO ENTER ON LINE 17

Report returned no data.

LINE 18 DETAIL: ACTIVITIES TO CONSIDER IN DETERMINING THE AMOUNT TO ENTER ON LINE 18

Plan Year	IDIS Project	IDIS Activity	Activity Name	Matrix Code	National Objective	Drawn Amount
2016	2	389	Newbridge Place	03K	LMH	$9,471.60
				03K	**Matrix Code**	**$9,471.60**
Total						**$9,471.60**

Plan Year	IDIS Project	IDIS Activity	Activity Name	Matrix Code	National Objective	Drawn Amount
2016	2	389	Newbridge Place	03K	LMH	$10,502.00
				03K	**Matrix Code**	**$10,502.00**
Total						**$10,502.00**

LINE 19 DETAIL: ACTIVITIES INCLUDED IN THE COMPUTATION OF LINE 19

Plan Year	IDIS Project	IDIS Activity	Voucher Number	Activity Name	Matrix Code	National Objective	Drawn Amount
2016	3	390	6084651	Affordable Housing Property Acquisition	01	LMH	$96,251.00
					01	**Matrix Code**	**$96,251.00**
2017	3	408	6147662	Medford Senior Center Facility Improvement	03A	LMC	$9,883.70
					03A	**Matrix Code**	**$9,883.70**
2017	5	396	6147662	Union Park ADA Upgrade Project	03F	LMA	$6,386.45
2017	6	395	6147662	Jackson Park ADA Upgrade Project	03F	LMA	$3,420.00
					03F	**Matrix Code**	**$9,806.45**
2015	17	370	6087004	Neighborhood Infrastructure Improvements Project	03L	LMA	$3,514.70
2015	17	370	6087005	Neighborhood Infrastructure Improvements Project	03L	LMA	$16,541.33
2015	17	370	6087409	Neighborhood Infrastructure Improvements Project	03L	LMA	$200.00
2015	17	370	6147664	Neighborhood Infrastructure Improvements Project	03L	LMA	$120,868.65
					03L	**Matrix Code**	**$141,124.68**
2017	7	406	6147662	Porch Rehabilitation	03Q	LMC	$2,500.00
					03Q	**Matrix Code**	**$2,500.00**
2017	10	398	6147662	Community Volunteer Network Foster Grandparent Program	05A	LMC	$10,172.35
					05A	**Matrix Code**	**$10,172.35**
2017	12	397	6147662	Furthering Fair Housing - Legal Services	05C	LMC	$9,042.00
					05C	**Matrix Code**	**$9,042.00**
2017	13	400	6147662	Wrap Around Case Managment Program	05D	LMC	$23,455.00
2017	15	404	6147662	Healthy Families, Healthy Communities	05D	LMC	$8,975.50
					05D	**Matrix Code**	**$32,430.50**
2016	4	383	6087004	Reducing Medford Homelessness in 2016	05Q	LMC	$1,809.26
2017	14	401	6147662	Reducing Medford Homelessness in 2017	05Q	LMC	$5,730.00
					05Q	**Matrix Code**	**$7,539.26**
2017	8	402	6147662	Credit Counseling Services for Low-Income Community Members Program	05Z	LMC	$917.65
					05Z	**Matrix Code**	**$917.65**
2015	21	393	6147662	PeopleFirst Properties Rental Rehab Project	14A	LMH	$196.00
2016	1	388	6087006	Homeowner Repair Program	14A	LMH	$141,488.90
2016	1	388	6097502	Homeowner Repair Program	14A	LMH	$80,350.61
2016	1	388	6147662	Homeowner Repair Program	14A	LMH	$73,749.11
					14A	**Matrix Code**	**$295,784.62**
2015	20	392	6087387	City of Medford Code Enforcement of Blighted Properties	15	LMA	$574.17
					15	**Matrix Code**	**$574.17**
Total							**$616,026.38**

Plan Year	IDIS Project	IDIS Activity	Voucher Number	Activity Name	Matrix Code	National Objective	Drawn Amount
2017	3	408	6196357	Medford Senior Center Facility Improvement	03A	LMC	$3,870.57
					03A	**Matrix Code**	**$3,870.57**
2017	5	396	6196357	Union Park ADA Upgrade Project	03F	LMA	$2,113.55
2017	6	395	6196357	Jackson Park ADA Upgrade Project	03F	LMA	$29,080.00
					03F	**Matrix Code**	**$31,193.55**
2015	17	370	6196357	Neighborhood Infrastructure Improvements Project	03L	LMA	$15,774.42
					03L	**Matrix Code**	**$15,774.42**
2017	12	397	6196357	Furthering Fair Housing - Legal Services	05C	LMC	$4,521.00
					05C	**Matrix Code**	**$4,521.00**
2017	15	404	6196357	Healthy Families, Healthy Communities	05D	LMC	$8,975.50
					05D	**Matrix Code**	**$8,975.50**
2017	14	401	6196357	Reducing Medford Homelessness in 2017	05Q	LMC	$15,173.41
					05Q	**Matrix Code**	**$15,173.41**
2017	8	402	6196357	Credit Counseling Services for Low-Income Community Members Program	05Z	LMC	$3,702.74
					05Z	**Matrix Code**	**$3,702.74**
2015	21	393	6196357	PeopleFirst Properties Rental Rehab Project	14A	LMH	$24,804.00
2017	9	405	6196357	Homeowner Repair	14A	LMH	$180,262.19
					14A	**Matrix Code**	**$205,066.19**
2017	2	407	6196357	Royal Apartments Infrastructure Improvement Project	14C	LMH	$48,974.92
					14C	**Matrix Code**	**$48,974.92**
2015	20	392	6196358	City of Medford Code Enforcement of Blighted Properties	15	LMA	$800.00
					15	**Matrix Code**	**$800.00**
Total							**$338,052.30**

LINE 27 DETAIL: ACTIVITIES INCLUDED IN THE COMPUTATION OF LINE 27

Plan Year	IDIS Project	IDIS Activity	Voucher Number	Activity Name	Matrix Code	National Objective	Drawn Amount
2017	10	398	6147662	Community Volunteer Network Foster Grandparent Program	05A	LMC	$10,172.35
					05A	**Matrix Code**	**$10,172.35**
2017	12	397	6147662	Furthering Fair Housing - Legal Services	05C	LMC	$9,042.00
					05C	**Matrix Code**	**$9,042.00**
2017	13	400	6147662	Wrap Around Case Managment Program	05D	LMC	$23,455.00
2017	15	404	6147662	Healthy Families, Healthy Communities	05D	LMC	$8,975.50
					05D	**Matrix Code**	**$32,430.50**
2016	4	383	6087004	Reducing Medford Homelessness in 2016	05Q	LMC	$1,809.26
2017	14	401	6147662	Reducing Medford Homelessness in 2017	05Q	LMC	$5,730.00
					05Q	**Matrix Code**	**$7,539.26**
2017	8	402	6147662	Credit Counseling Services for Low-Income Community Members Program	05Z	LMC	$917.65
					05Z	**Matrix Code**	**$917.65**
Total							**$60,101.76**

Plan Year	IDIS Project	IDIS Activity	Voucher Number	Activity Name	Matrix Code	National Objective	Drawn Amount
2017	12	397	6196357	Furthering Fair Housing - Legal Services	05C	LMC	$4,521.00
					05C	**Matrix Code**	**$4,521.00**
2017	15	404	6196357	Healthy Families, Healthy Communities	05D	LMC	$8,975.50
					05D	**Matrix Code**	**$8,975.50**
2017	14	401	6196357	Reducing Medford Homelessness in 2017	05Q	LMC	$15,173.41
					05Q	**Matrix Code**	**$15,173.41**
2017	8	402	6196357	Credit Counseling Services for Low-Income Community Members Program	05Z	LMC	$3,702.74
					05Z	**Matrix Code**	**$3,702.74**
Total							**$32,372.65**

LINE 37 DETAIL: ACTIVITIES INCLUDED IN THE COMPUTATION OF LINE 37

Plan Year	IDIS Project	IDIS Activity	Voucher Number	Activity Name	Matrix Code	National Objective	Drawn Amount
2016	10	382	6087004	Program Administration	21A		$5,491.30
2016	10	382	6087005	Program Administration	21A		$14,432.42
2016	10	382	6087006	Program Administration	21A		$796.66
2017	17	410	6147662	Program Administration	21A		$66,192.51
					21A	**Matrix Code**	**$86,912.89**
Total							**$86,912.89**

Plan Year	IDIS Project	IDIS Activity	Voucher Number	Activity Name	Matrix Code	National Objective	Drawn Amount
2017	17	410	6196357	Program Administration	21A		$59,153.24
					21A	**Matrix Code**	**$59,153.24**
Total							**$59,153.24**

CITY OF MEDFORD
AGENDA ITEM COMMENTARY

www.ci.medford.or.us

Item No: 40.2

DEPARTMENT: Planning
PHONE: (541) 774-2380
STAFF CONTACT: Matt Brinkley, AICP, Planning Department

AGENDA SECTION: Public Hearings
MEETING DATE: November 1, 2018

COUNCIL BILL 2018-124
An ordinance proclaiming annexation to the City of Medford of an approximate 1.65 acre parcel, including an adjacent right-of-way, located on the southeast corner of Table Rock Road and Biddle Road (4256 Table Rock Road), and concurrent zone change from County LI (Light Industrial) to City I-L (Light Industrial) and designated within the Limited Industrial Overlay District (I-00), and withdrawal of said property from Medford Rural Fire Protection District #2, effective pursuant to State Law.

SUMMARY AND BACKGROUND
Consideration of a request for annexation to the City of Medford of an approximate 1.65 acre parcel located at the southeast corner of Table Rock Road and Biddle Road (address: 4256 Table Rock Road). The current County zoning designation of Light Industrial will be changed to the City I-L/I-00 (Light Industrial/Limited Industrial Overlay) zoning district. The property will be removed from Medford Rural Fire Protection District #2. (A-18-083)

The subject property previously contained a single-family home, which was recently demolished after the home was destroyed by a fire. Permits have been issued by Jackson County for the construction of a new single-family home on the property, and pre-construction has begun. It is the applicant's intent to connect the new development to City water via the 30-inch water main running under Table Rock Road, which abuts the parcel's westerly property line.

PREVIOUS COUNCIL ACTIONS
On October 4, 2018, Council approved Council Bill 2018-117 establishing a hearing date of November 1, 2018, for consideration of the matter.

ANALYSIS
The applicant/owner, JBR-TABLEROCK, LLC, submitted the request for annexation and consented in writing. The property is located within the City's Urban Growth Boundary and is contiguous with the city limits along the parcel's easterly property line. The property has a General Land Use Plan (GLUP) map designation of General Industrial (GI), which is compatible with the Light Industrial (I-L) City zoning designation. The property is currently zoned by Jackson County as Light Industrial (LI).

FINANCIAL AND/OR RESOURCE CONSIDERATIONS
The property's assessed (land) value is $221,140. The property is currently in the pre-construction phase for a new single-family home on the property, which will increase the property's contribution total to the City once the value of the new improvements has been assessed.

TIMING ISSUES
None.

COUNCIL OPTIONS
- Approve the ordinance as presented
- Modify the ordinance as presented
- Deny the ordinance as presented and direct staff regarding further action

STAFF RECOMMENDATION
Staff recommends approval of the annexation.

CITY OF MEDFORD
AGENDA ITEM COMMENTARY

www.ci.medford.or.us

Item No: 40.2

SUGGESTED MOTION

I move to adopt the ordinance authorizing the annexation of the 1.65-acre parcel located at 4256 Table Rock Road.

EXHIBITS

Ordinance
City Council report, including Exhibits A-I
Vicinity map

ORDINANCE NO. 2018-124

AN ORDINANCE proclaiming annexation to the City of Medford of an approximate 1.65 acre parcel, including an adjacent right-of-way, located on the southeast corner of Table Rock Road and Biddle Road (4256 Table Rock Road), and concurrent zone change from County LI (Light Industrial) to City I-L (Light Industrial) and designated within the Limited Industrial Overlay District (I-00), and withdrawal of said property from Medford Rural Fire Protection District #2, effective pursuant to State Law.

WHEREAS, the owners of the land in the territory to be annexed have consented in writing to the annexation, said consent having been heretofore filed with the City Recorder in the manner prescribed by law; and

WHEREAS, the City Council by Resolution No. 2018-17 adopted October 4, 2018, dispensed with submitting the question of the proposed annexation to the electors of the city and set 6:00 p.m. on the 1st day of November, 2018, in Medford City Council Chambers as the time and place of hearing thereon, together with a zone change to City I-L (Light Industrial), designated within the Limited Industrial Overlay District (I-00), and withdrawing said property from Medford Rural Fire Protection District #2, at which time and place the registered voters of the city and other interested parties were given an opportunity to be heard on the question; and

WHEREAS, notices of said public hearing were published and posted in the manner and for the time prescribed by law and the public hearing was duly held by and before the City Council as provided by law and by the terms of said resolution and the published notice, and it appears to be in the best interest of the city and of the area involved that it be annexed to the City of Medford, that the area be rezoned to City I-L (Light Industrial), designated within the Limited Industrial Overlay District (I-00) and that the area be withdrawn from Medford Rural Fire Protection District #2; and

WHEREAS, the City Council finds and determines that the facts and conclusions in the Staff Report dated October 25, 2018, on file in the Planning Department and incorporated herein by reference, are true and correct and are hereby adopted as the findings of the Council; now, therefore,

THE CITY OF MEDFORD ORDAINS AS FOLLOWS:

Section 1. The property described in Exhibit A & B, attached hereto and incorporated herein, shall be annexed to the City of Medford, Oregon, and rezoned to City I-L (Light Industrial), designated within the Limited Industrial Overlay District (I-00) as provided herein.

Section 2. The above-described property annexed to the City of Medford is hereby withdrawn from Medford Rural Fire Protection District #2 at the effective date of annexation.

Section 3. The City Recorder shall submit to the Secretary of the State of Oregon a certified copy of this Ordinance. The City Recorder shall also, within ten days of the effective date of this annexation, send copies of this Ordinance to the County Clerk and County Assessor of Jackson County, Oregon, and to Medford Rural Fire Protection District #2.

PASSED by the council and signed by me in authentication of its passage this _____ day of _____, 2018.

ATTEST:_____ _____
City Recorder Mayor

APPROVED:_____, 2018. _____
Mayor

EXHIBIT "A"

Commencing at the Northwest corner for Donation Land Claim No. 57 in Township 37 South, Range 2 West of the Willamette Meridian in Jackson County, Oregon; thence South 55°55'36"East, 785.71 feet; thence North 89°29'20" East, 20.11 feet to a point on the Easterly right-of-way line for Table Rock Road. Said additional twenty-foot (20) right-of-way width acquired by Jackson County and described in Document 2017-004069, point also being on the Southerly right-of-way line for Biddle road, said point marked with a 5/8-inch diameter iron pin, the Point of Beginning of this description; thence along said right-of-way for Biddle Road North 89°29'20" East, 86.50 feet to a 5/8-inch diameter iron pin marking the southerly 80 foot offset at Engineers Station 66+50.00 as shown on Highway Right-of-Way Map 9B-11-8; thence continue along said Biddle Road right-of-way along a 600 ft spiral curve to the right 60.85 feet, the long chord of which bears South 72°48'00" East, 60.08 feet to a 5/8-inch diameter iron pin marking the westerly boundary line of the area annexed to the City of Medford by Ordinance Number 9468 passed August 23, 1966; thence leaving said Biddle Road right-of-way South 00°19'40" East, 8.61 feet along said westerly annexed line to a 2-inch diameter iron pipe marking the northwest corner of the area annexed to the City of Medford by Ordinance Number 1999-201; thence South 00°19'40" East, 475.96 feet along the westerly annexation line to a 5/8-inch diameter iron pin; thence South 89°51'00" West, 144.24 feet leaving said annexation line to a point on the Easterly right-of-way for Table Rock Road, said point marked with a 5/8-inch diameter iron pin; thence along said right-of-way line North 00°16'37" West, 501.94 feet to a 5/8-inch diameter iron pin, the Point of Beginning of this description.

End of Description.

372W01D-0600 (1-042694-1)

Refer to Jackson County filed survey No. 22280 dated July 7, 2017. Basis of Bearing is grid, Oregon Coordinate Reference System (OCRS), Grants Pass-Ashland Zone.

STEPHAN L. BAROTT
OREGON LS2332
CERTIFICATED RENEWS 12-31-2019

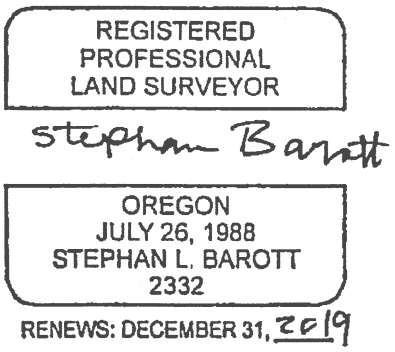
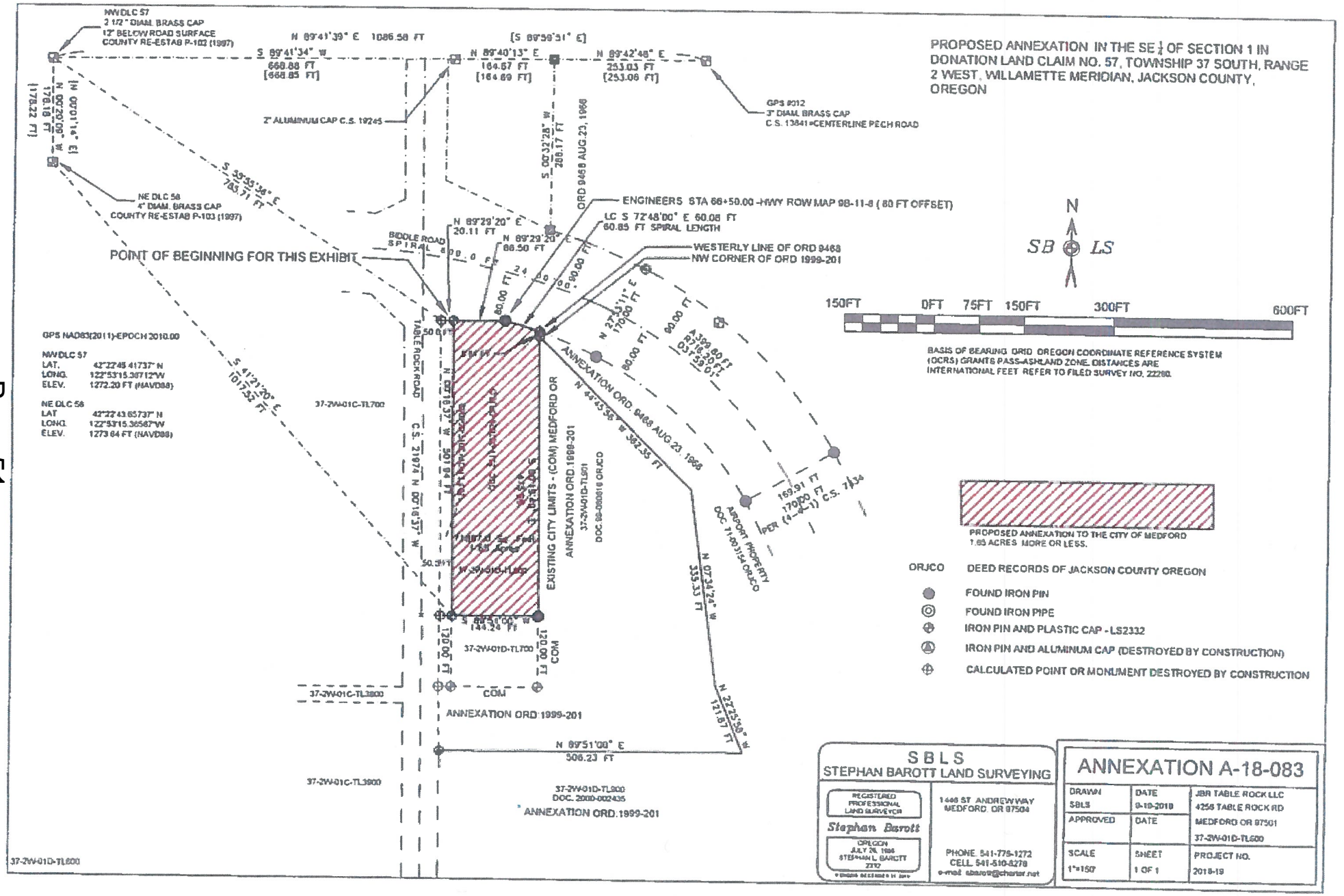


EXHIBIT B


PROPOSED ANNEXATION IN THE SE ¼ OF SECTION 1 IN DONATION LAND CLAIM NO. 57, TOWNSHIP 37 SOUTH, RANGE 2 WEST, WILLAMETTE MERIDIAN, JACKSON COUNTY, OREGON
NW DLC 57
2 1/2" DIAM. BRASS CAP
12" BELOW ROAD SURFACE
COUNTY RE-ESTAB P-102 (1997)
N 89°41'39" E 1086.58 FT
[S 89°58'31" E]
S 89°41'34" W
668.88 FT
[668.85 FT]
N 89°40'13" E
164.67 FT
[164.69 FT]
N 89°42'46" E
253.03 FT
[253.08 FT]
GPS #012
3" DIAM. BRASS CAP
C.S. 13841 "CENTERLINE PECH ROAD
2" ALUMINUM CAP C.S. 19245
S 00°32'28" W
286.17 FT
ORD 9468 AUG.23, 1968
N 00°20'00" W
178.18 FT
[178.22 FT]
S 59°39'38" E
105.71 FT
NE DLC 58
4" DIAM. BRASS CAP
COUNTY RE-ESTAB P-103 (1997)
ENGINEERS STA 66+50.00 -HWY ROW MAP 98-11-8 (60 FT OFFSET)
LC S 72°48'00" E 60.08 FT
60.85 FT SPIRAL LENGTH
N 89°29'20" E
20.11 FT
N 89°29'20" E
66.50 FT
BIDDLE ROAD
SPIRAL
WESTERLY LINE OF ORD 9468
NW CORNER OF ORD 1999-201
POINT OF BEGINNING FOR THIS EXHIBIT
60.00 FT
R=1190.00 FT
Δ=03°15'30"
L=67.73 FT
N 27°33'11" E
17.00 FT
60.00 FT
ANNEXATION ORD. 9468 AUG.23, 1968
N 44°45'58" W 382.35 FT
N
SB LS
150FT 0FT 75FT 150FT 300FT 600FT
BASIS OF BEARING: ORID OREGON COORDINATE REFERENCE SYSTEM (OCRS) GRANTS PASS-ASHLAND ZONE. DISTANCES ARE INTERNATIONAL FEET. REFER TO FILED SURVEY NO. 22260.
GPS NAD83(2011)-EPOCH 2010.00
NW DLC 57
LAT. 42°22'45.41737" N
LONG. 122°53'15.39712"W
ELEV. 1272.20 FT (NAVD88)
NE DLC 58
LAT 42°22'43.65737" N
LONG. 122°53'15.36567"W
ELEV. 1273.64 FT (NAVD88)
S 41°21'20" E
1017.55 FT
TABLE ROCK ROAD
C.S. 21974
N 00°16'37" W 301.94 FT
50.00 FT
37-2W-01C-TL700
37-2W-01D-TL700
EXISTING CITY LIMITS - (COM) MEDFORD OR ANNEXATION ORD.1999-201
37-2W-01D-TL501
DOC.99-000016 ORJCO
1.65 Ac. Net
1.85 Acres
N 89°51'00" E
144.24 FT
120.00 FT
120.00 FT
COM
37-2W-01C-TL3800
ANNEXATION ORD.1999-201
N 89°51'00" E
506.23 FT
37-2W-01D-TL800
DOC. 2000-002435
ANNEXATION ORD.1999-201
37-2W-01D-TL800
AIRPORT PROPERTY
DOC. 71-00-3154 ORJCO
169.91 FT
170.00 FT
PER (4-4-1) C.S. 7434
N 07°34'24" W
335.33 FT
N 22°23'38" W
121.87 FT
PROPOSED ANNEXATION TO THE CITY OF MEDFORD
1.65 ACRES MORE OR LESS.
ORJCO DEED RECORDS OF JACKSON COUNTY OREGON
FOUND IRON PIN
FOUND IRON PIPE
IRON PIN AND PLASTIC CAP - LS2332
IRON PIN AND ALUMINUM CAP (DESTROYED BY CONSTRUCTION)
CALCULATED POINT OR MONUMENT DESTROYED BY CONSTRUCTION
SBLS
STEPHAN BAROTT LAND SURVEYING
REGISTERED PROFESSIONAL LAND SURVEYOR
Stephan Barott
OREGON JULY 26, 1996 STEPHAN L. BAROTT 2372
1446 ST ANDREW WAY
MEDFORD, OR 97504
PHONE. 541-776-1272
CELL. 541-510-8278
e-mail sbarott@charter.net
ANNEXATION A-18-083
DRAWN SBLS
DATE 9-10-2018
APPROVED
DATE
SCALE 1"=150'
SHEET 1 OF 1
JBR TABLE ROCK LLC
4258 TABLE ROCK RD
MEDFORD OR 97501
37-2W-01D-TL600
PROJECT NO. 2018-19

STAFF REPORT

for a Type IV Legislative decision: **Annexation**

Project	JBR-Table Rock – Annexation
File no.	A-18-083
To	Mayor and City Council
From	Dustin Severs, Planner III
Reviewer	Kelly Akin, Assistant Planning Director
Date	October 25, 2018

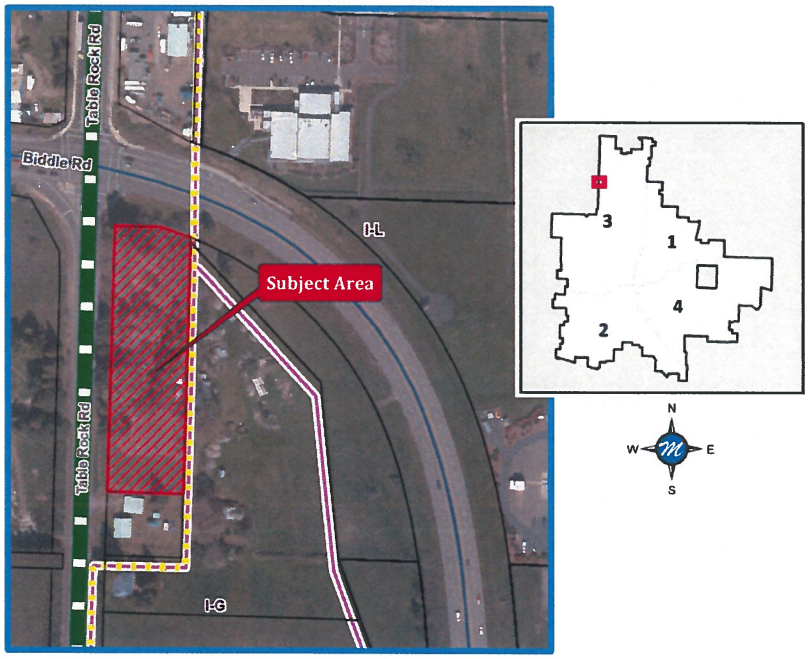
for November 1, 2018 hearing

BACKGROUND

Proposal

Consideration of a request for annexation to the City of Medford of an approximate 1.65 acre parcel, located at the southeast corner of Table Rock Road and Biddle Road (Address: 4256 Table Rock Road). The current County zoning designation of Light Industrial will be changed to the City I-L/I-00 (Light Industrial/Limited Industrial Overlay) zoning district. The property will be removed from Medford Rural Fire Protection District #2.

Vicinity Map



History

On October 4, 2018 – Resolution No. 2018-117 – Council approved a resolution establishing a hearing date of November 1, 2018, for consideration of the matter.

Authority

This proposed plan authorization is a Type IV Legislative decision. The City Council is authorized to approve annexations under Medford Municipal Code 10.214.

FINDINGS AND CONCLUSIONS

Criteria

MLDC 10.216(C)

The City Council must find that the following State requirements are met in order to approve an annexation:

1. *The land is within the City Urban Growth Boundary.*
2. *The land is contiguous to the current city limits.*
3. *Unless the land being considered for annexation is enclaved by the City or the City chooses to hold an election, a majority of the land owners and/or electors have consented in writing to the annexation per ORS 222.125 or ORS 222.170.*

Findings

- The property is located within the City's Urban Growth Boundary.
- The property is contiguous with the City limits along the parcel's easterly property line.
- The applicant/owner has submitted the request for annexation and has consented in writing in accordance with the applicable state statutes.

Staff finds that all three of the above criteria are satisfied.

Conclusions

The property under consideration meets the applicable criteria for annexation.

RECOMMENDED ACTION

Adopt the findings as recommended by staff and approve the ordinance for the annexation per the staff report dated October 25, 2018, including Exhibits A through I.

EXHIBITS

A Applicant's Findings
B Signed Consent to Annexation Form
C Medford Water Commission Report
D Medford Fire Department Report

E Medford Public Works Department Report
F Building Department Report
G Rogue Valley Sewer Services (RVSS) Report
H Department of Revenue preliminary review
I Legal description and Exhibit Map
Vicinity Map

CITY COUNCIL AGENDA: **NOVEMBER 1, 2018**

FINDINGS OF FACT

Parcel is described as: **Ts. 37, R.2W, S. 01D, Tax Lot 600**

The property in this application is owned by JBR llc and the managing member is John Pierce of Medford, Oregon. The parcel is entirely in the City of Medford Urban Growth Boundary. The parcel touches the City limits along is western boundary, its northern boundary and its entire eastern boundary.

The majority owner has consented, in writing, to the annexation per ORS 222.125 or ORS 222.170. (Notarized consent is a part of this annexation request).

The parcel, after a 2017 taking of land for the widening of Table Rock Road per survey # 22280, contains 71,827.8 square feet or 1.649 acres. (See 2017 survey attached to this application).

All of the required consent forms are attached to this application and notarized.

This parcel contained a single family home that was demolished before the upgrades and widening of Table Rock Road / E. Pine Street / Biddle Road intersection improvements began. The Owner determined to replace the dwelling on the property after a fire essentially destroyed the home. A permit has been issued from Jackson County Development Services to replace the home and pre-construction has begun (A site plan of the approved construction is included with this application).

The dwelling will continue to be served by an existing on-site septic system and water well. It is the intent of the owner, in the future to connect to the West across Table Rock Road to an RVSS sewer line and tap into a 30" diameter water line main that is in Table Rock Road and runs along the eastern edge of the right-of-way. The Medford Water Commission is suggesting an 8" diameter tap and saddle with a fire hydrant and 6" inch diameter "tee" to serve the property.

Rogue Valley Sewer Services will connect this property in the future. The applicant is having engineering drawings prepared for the eventual sere and water connections. The connections are time critical as there will be a five year "lock-out" for any cuts in Table Rock Road once it is completed.

7

RECEIVED
JUN 20 2018
PLANNING DEPT.

ANNEXATION APPLICATION

CONSENT TO ANNEX

Consent is hereby given to the annexation by the City of Medford, Oregon of the following described real property:

Map and Tax Lot: T37, R2W, S. 01 D, TAX LOT 6000

Address: 42560 TABLE ROCK RD, MEDFORD, OR, 97504

Legal Description:

in the corporate limits of said city, which is owned by the undersigned

DATED this 13th day of June, 2018.

STATE OF OREGON)
) ss
County of Jackson)

On this 13th day of June, 2018, personally appeared Regina Breeze,

who, being duly sworn did acknowledge the foregoing instrument to be his/her/their voluntary act and deed.

OFFICIAL STAMP
REBEL JOY ARMANTROUT
NOTARY PUBLIC-OREGON
COMMISSION NO. 936333
MY COMMISSION EXPIRES FEBRUARY 11, 2019

Notary Public for Oregon
My Commission expires 2-11-19

Filed with the City of Medford this _____ day of _____, 20_____.

Planning Director or designee

CITY OF MEDFORD
EXHIBIT # B
File # A-18-083

MEDFORD WATER COMMISSION

BOARD OF WATER COMMISSIONERS

Staff Memo

TO: Planning Department, City of Medford

FROM: Rodney Grehn P.E., Water Commission Staff Engineer

SUBJECT: A-18-083

PARCEL ID: 371W30AC TL 2500

PROJECT: Consideration of a request for annexation to the City of Medford of an approximate 1.65 acre parcel, including the adjacent right-of-way, located at the southeast corner of Table Rock Road and Biddle Road (Address: 4256 Table Rock Road). The current County zoning designation of Light Industrial will be changed to the City I-L/I-00 (Light Industrial/Limited Industrial Overlay) zoning district. The property will be removed from Medford Rural Fire Protection District #2. Applicant: JBR-Table Rock LLC; Agent: L. Calvin Martin; Planner, Dustin Severs.

DATE: August 29, 2018

I have reviewed the above plan authorization application as requested. Conditions for approval and comments are as follows:

CONDITIONS

1. The water facility planning/design/construction process will be done in accordance with the Medford Water Commission (MWC) "Regulations Governing Water Service" and "Standards For Water Facilities/Fire Protection Systems/Backflow Prevention Devices."

2. All parcels/lots of proposed property divisions will be required to have metered water service prior to recordation of final map, unless otherwise arranged with MWC.

3. Further MWC Conditions of Development will be provided at time of future land development review.

COMMENTS

1. Off-site water line installation is not required.

2. On-site water facility construction may be required depending on future Land Development Application review.

3. Static water pressure in this location is approximately 97 psi.

4. MWC-metered water service does not exist to this property.

5. Access to MWC water lines is available. There is an existing 30-inch water transmission main on the east side of Table Rock Road. There is also a recently installed 12-inch water line stub to this property to facilitate future site development.

CITY OF MEDFORD
EXHIBIT # C
File # A-18-083

N

0 25 50 100 Feet

Scale: 1"=100'

Water Facility Map for City of Medford App: A-18-083

August 29, 2018

Legend

- Air Valve
- Sample Station
- Fire Service
- Hydrant
- Reducer
- Blow Off
- Plugs-Caps

Water Meters:

- Active Meter
- On Well
- Unknown
- Vacant

Water Valves:

- Butterfly Valve
- Gate Valve
- Tapping Valve

Water Mains:

- Active Main
- Abandoned Main
- Reservoir Drain Pipe
- Pressure Zone Line

Boundaries:

- Urban Growth Boundary
- City Limits
- Tax Lots

MWC Facilities:

- C Control Station
- P Pump Station
- R Reservoir

MEDFORD WATER COMMISSION

Date: 8/23/2018
Path: S:\MXD\Rivia MWC Map - MWC SOE - Letter LS - July 30 2018.mxd

Medford Fire-Rescue Land Development Report

Review/Project Information

Reviewed By: Kleinberg, Greg
LD #: A18083
Review Date: 8/6/2018

Planner: Dustin Severs

Applicant: 5tdsis@aol.com

Project Location: 4256 Table Rock Road

ProjectDescription: Annexation request to City of Medford of a approx. 1.65 acre parcel

Specific Development Requirements for Access & Water Supply

Conditions

Reference	Description
Approved	Approved as submitted with no additional conditions or requirements.

Construction General Information/Requirements

Development shall comply with access and water supply requirements in accordance with the Oregon Fire Code in affect at the time of development submittal. Fire apparatus access roads are required to be installed prior to the time of construction. The approved water supply for fire protection (fire hydrants) is required to be installed prior to construction when combustible material arrives at the site.

Specific fire protection systems may be required in accordance with the Oregon Fire Code.

This plan review shall not prevent the correction of errors or violations that are found to exist during construction. This plan review is based on information provided only.

Design and installation shall meet the Oregon requirements of the International Fire, Building, Mechanicial Codes and applicable NFPA Standards.

Medford Fire-Rescue, 200 S Ivy St. Rm 180, Medford OR 97501 541-774-2300

www.medfordfirerescue.org

CITY OF MEDFORD
EXHIBIT # D
File # A-18-083

Medford – A fantastic place to live, work and play

CITY OF MEDFORD

Date: 8/29/2018
File Number: A-18-083

PUBLIC WORKS DEPARTMENT STAFF REPORT

Annexation – 4256 Table Rock Road (TL 600)

Project: Consideration of a request for annexation to the City of Medford of an approximate 1.65 acre parcel, including the adjacent right-of-way. Located at the southeast corner of Table Rock Road and Biddle Road (Address: 4256 Table Rock Road). The current County zoning designation of Light Industrial will be changed to the City I-L/I-00 (Light Industrial/Limited Industrial Overlay) zoning district. The property will be removed from Medford Rural Fire Protection District #2.

Applicant: JBR – Table Rock LLC

Planner: Dustin Severs, Planner III

A. STREETS

Biddle Road is classified as a Major Arterial street and runs along the north side of the parcel and is maintained by Jackson County. Table Rock Road is a Minor Arterial street and runs along the west side of the parcel and is also maintained by the County. Both streets are paved with curb and gutter. Both streets will continue to be maintained by Jackson County unless a jurisdictional transfer is completed.

B. SANITARY SEWERS

The area of this proposed annexation lies within the Rogue Valley Sewer Service (RVSS) area. Contact RVSS for sanitary sewer accessibility and capacity adequacy.

C. STORM DRAINAGE

Future development on this parcel will require stormwater detention and stormwater quality facilities, which shall comply with Medford Land Development Code (MLDC) Sections 10.486 and 10.729 and the Rogue Valley Stormwater Quality Design Manual.

PUBLIC WORKS DEPARTMENT
ENGINEERING & DEVELOPMENT DIVISION
200 S. IVY STREET
MEDFORD, OREGON 97501
www.ci.medford.or.us
TELEPHONE (541) 774-2100
FAX (541) 774-2552

CITY OF MEDFORD
EXIBIT # E
File # A-18-083

D. SYSTEM DEVELOPMENT CHARGES

Future development/building within this parcel will be subject sewer treatment and street systems development charges. These SDC fees shall be paid at the time individual building permits are taken out, or you may apply for the SDC Deferral Program if your development qualifies.

This development is also subject to storm drain system development charges. A portion of the storm drain system development charge shall be collected at the time of the approval of the final plat, as applicable.

E. UTILITY FEES

Upon annexation, this parcel will be subject to City of Medford monthly utility fees as applicable.

Prepared by: Doug Burroughs

PUBLIC WORKS DEPARTMENT
ENGINEERING & DEVELOPMENT DIVISION
200 S. IVY STREET
MEDFORD, OREGON 97501
www.ci.medford.or.us
TELEPHONE (541) 774-2100
FAX (541) 774-2552

Memo

To: Dustin Severs, Planning Department

From: Chad Wiltrout, Building Department (541) 774-2363

CC: JBR-Table rock LLC, Applicant; L. Calvin Martin; Agent.

Date: August 29, 2018

Re: August 29, 2018 LDC Meeting Item #1 A-18-083

Please Note:

This is not a plan review. Unless noted specifically as Conditions of Approval, general comments are provided below based on the general information provided; these comments are based on the 2014 Oregon Structural Specialty Code (OSSC) unless noted otherwise. Plans need to be submitted and will be reviewed by a commercial plans examiner, and there may be additional comments.

Fees are based on valuation. Please contact Building Department front counter for estimated fees at (541) 774-2350 or building@cityofmedford.org.

For questions related to the Conditions or Comments, please contact me, Chad Wiltrout, directly at (541) 774-2363 or chad.wiltrout@cityofmedford.org.

General Comments:

1. For list of applicable Building Codes, please visit the City of Medford website: www.ci.medford.or.us Click on "City Departments" at top of screen; click on "Building"; click on "Design Criteria" on left side of screen and select the appropriate design criteria.

2. All plans are to be submitted electronically. Information on the website: www.ci.medford.or.us Click on "City Departments" at top of screen; click on "Building"; click on "Electronic Plan Review (ePlans)" for information.

3. A site excavation and grading permit will be required if more than 50 cubic yards is disturbed.

4. A separate demolition permit will be required for demolition of any structures not shown on the plot plan.

Comments:

5. Once the property is annexed, any new building will require permits to be submitted to the City of Medford for review and approval.

CITY OF MEDFORD
EXHIBIT # F
File # A-18-083

ROGUE VALLEY SEWER SERVICES
Location: 138 West Vilas Road, Central Point, OR - Mailing Address: P.O. Box 3130, Central Point, OR 7502-0005
Tel. (541) 664-6300, Fax (541) 664-7171 www.RVSS.us

October 20, 2015

City of Medford Planning Department
411 West 8th Street
Medford, Oregon 97501

Re: A-18-083, JBR Table Rock Annexation, Tax Lot 600, Map 372W01D

ATTN: Dustin,

The subject property is within the RVSS service area. There are currently no sewer facilities adjacent to the property. However, the property owner is working on approval to install a sleeve across Table Rock Road for a future sewer main extension from the west. The sewer main extension is required for future development.

This system has adequate capacity to serve the proposed zoning.

Feel free to contact me with any questions.

Sincerely,

Nicholas R. Bakke

Nicholas R. Bakke, PE
District Engineer

K:\DATA\AGENCIES\MEDFORD\PLANNG\ANNEXATION\2018\A-18-083_JBR TABLE ROCK ANNEXATION.DOC

CITY OF MEDFORD
EXHIBIT # G
File # A-18-083

Boundary Change Preliminary Review

DOR 15-P215-2018

OREGON DEPARTMENT OF REVENUE

Cadastral Information Systems Unit
PO Box 14380
Salem, OR 97309-5075
fax 503-945-8737
boundary.changes@oregon.gov

Dustin J Severs
City of Medford
Planning Department
200 South Ivy St. Room 240
Medford OR 97501

October 8, 2018

Documents received: 10/3/2018
From: Dustin J Severs

This letter is to inform you that the map and description for your planned Annexation to the City of Medford (A-18-083) in Jackson County have been reviewed per your request. They MEET the requirements of ORS 308.225 for use with an Order, Ordinance, or Resolution which must be submitted to the Jackson County Assessor and the Department of Revenue in final approved form before March 31 of the year in which the change will become effective.

Remove description for 372W01D-0600 (1-042694-1)
Include a copy of the assessors map for final

If you have any questions please contact Robert Ayers, 503-983-3032

EXHIBIT "A"
A-18-083

Commencing at the Northwest corner for Donation Land Claim No. 57 in Township 37 South, Range 2 West of the Willamette Meridian in Jackson County, Oregon; thence South 55°55'36"East, 785.71 feet; thence North 89°29'20" East, 20.11 feet to a point on the Easterly right-of-way line for Table Rock Road. Said additional twenty-foot (20) right-of-way width acquired by Jackson County and described in Document 2017-004069, point also being on the Southerly right-of-way line for Biddle Road, said point marked with a 5/8-inch diameter iron pin, the Point of Beginning of this description; thence along said right-of-way for Biddle Road North 89°29'20" East, 86.50 feet to a 5/8-inch diameter iron pin marking the southerly 80 foot offset at Engineers Station 66+50.00 as shown on Highway Right-of-Way Map 9B-11-8; thence continue along said Biddle Road right-of-way along a 600 ft spiral curve to the right 60.85 feet, the long chord of which bears South 72°48'00" East, 60.08 feet to a 5/8-inch diameter iron pin marking the westerly boundary line of the area annexed to the City of Medford by Ordinance Number 9468 passed August 23, 1966; thence leaving said Biddle Road right-of-way South 00°19'40" East, 8.61 feet along said westerly annexed line to a 2-inch diameter iron pipe marking the northwest corner of the area annexed to the City of Medford by Ordinance Number 1999-201; thence South 00°19'40" East, 475.96 feet along the westerly annexation line to a 5/8-inch diameter iron pin; thence South 89°51'00" West, 144.24 feet leaving said annexation line to a point on the Easterly right-of-way for Table Rock Road, said point marked with a 5/8-inch diameter iron pin; thence along said right-of-way line North 00°16'37" West, 501.94 feet to a 5/8-inch diameter iron pin, the Point of Beginning of this description.

End of Description.

372W01D-0600 (1-042694-1)

Refer to Jackson County filed survey No. 22280 dated July 7, 2017. Basis of Bearing is grid, Oregon Coordinate Reference System (OCRS), Grants Pass-Ashland Zone.

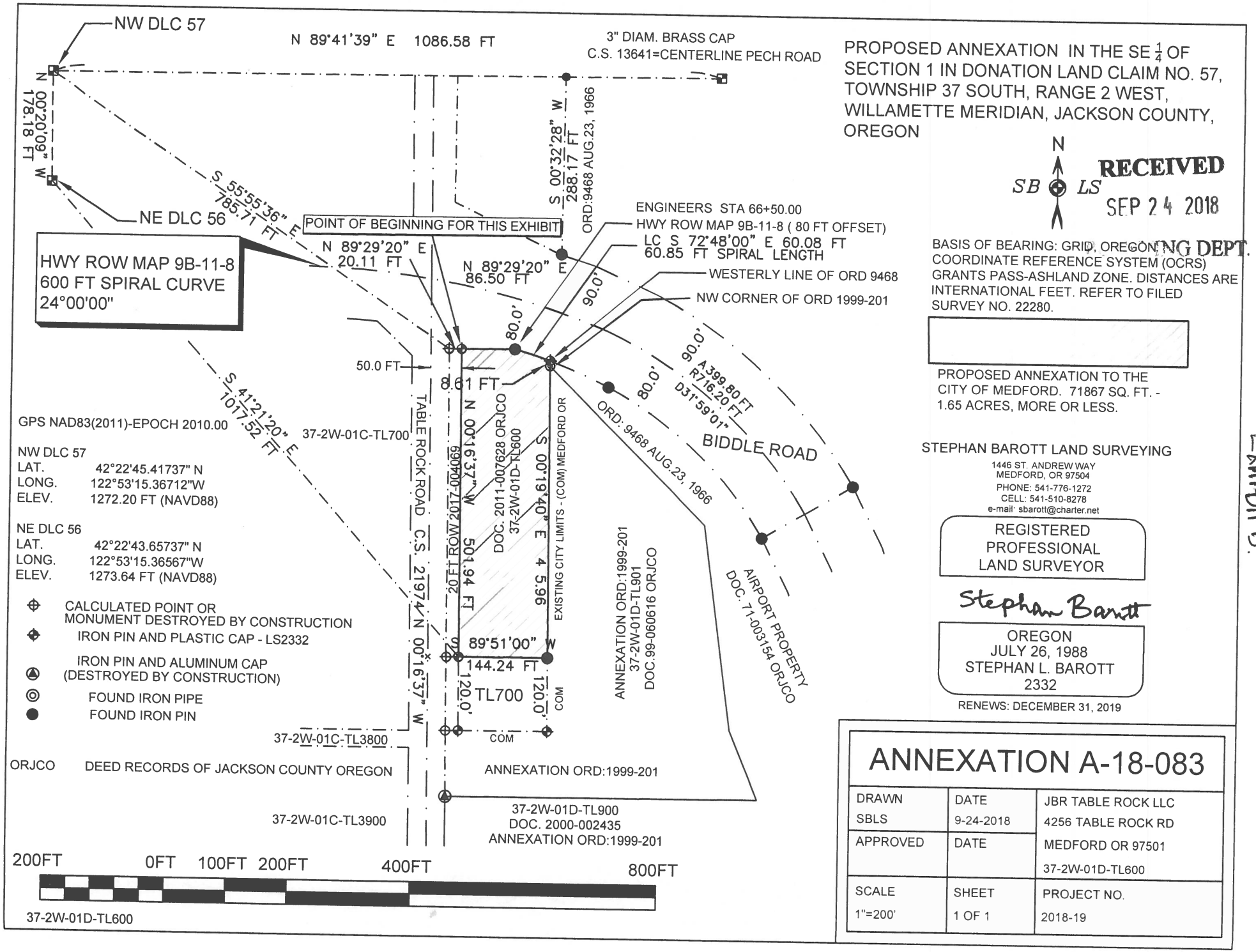
STEPHAN L. BAROTT
OREGON LS2332
CERTIFICATED RENEWS 12-31-2019

REGISTERED
PROFESSIONAL
LAND SURVEYOR

Stephan Barott

OREGON
JULY 26, 1988
STEPHAN L. BAROTT
2332

RENEWS: DECEMBER 31, 2019



PROPOSED ANNEXATION IN THE SE $\frac{1}{4}$ OF SECTION 1 IN DONATION LAND CLAIM NO. 57, TOWNSHIP 37 SOUTH, RANGE 2 WEST, WILLAMETTE MERIDIAN, JACKSON COUNTY, OREGON

N
SB LS

RECEIVED
SEP 24 2018
ENG DEPT.

BASIS OF BEARING: GRID, OREGON COORDINATE REFERENCE SYSTEM (OCRS) GRANTS PASS-ASHLAND ZONE. DISTANCES ARE INTERNATIONAL FEET. REFER TO FILED SURVEY NO. 22280.

PROPOSED ANNEXATION TO THE CITY OF MEDFORD. 71867 SQ. FT. - 1.65 ACRES, MORE OR LESS.

STEPHAN BAROTT LAND SURVEYING
1446 ST. ANDREW WAY
MEDFORD, OR 97504
PHONE: 541-776-1272
CELL: 541-510-8278
e-mail: sbarott@charter.net

REGISTERED PROFESSIONAL LAND SURVEYOR

Stephan Barott

OREGON
JULY 26, 1988
STEPHAN L. BAROTT
2332

RENEWS: DECEMBER 31, 2019

ANNEXATION A-18-083

DRAWN SBLS	DATE 9-24-2018	JBR TABLE ROCK LLC 4256 TABLE ROCK RD MEDFORD OR 97501 37-2W-01D-TL600
APPROVED	DATE	
SCALE 1"=200'	SHEET 1 OF 1	PROJECT NO. 2018-19

EXHIBIT B
Page 66

Exhibit B.

City of Medford

Planning Department

Vicinity Map

File Number:

A-18-083

Project Name:

JBR-TableRock LLC

Map/Taxlot:

372W01D TL 600

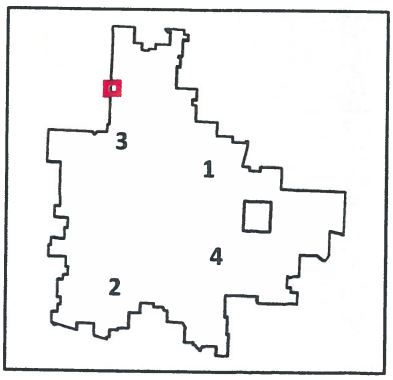
0 150 300 Feet

06/25/2018

Legend

- Subject Area
- Zoning Districts
- Tax Lots
- City Limits

N W E S



CITY OF MEDFORD
AGENDA ITEM COMMENTARY

www.ci.medford.or.us

Item No: 40.3

DEPARTMENT: Planning
PHONE: (541) 774-2380
STAFF CONTACT: Matt Brinkley, AICP CFM, Planning Director

AGENDA SECTION: Public Hearings
MEETING DATE: November 1, 2018

COUNCIL BILL 2018-125
An ordinance approving a legislative amendment to the Environmental Element and the Conclusions, Goals, Policies, and Implementation Strategies of the Medford Comprehensive Plan to incorporate the 2017 Natural Hazards Mitigation Plan.

SUMMARY AND BACKGROUND
Council is requested to consider a legislative amendment to incorporate by reference the 2017 City of Medford Natural Hazards Mitigation Plan (NHMP) into the Environmental Element of the Comprehensive Plan, and to make related updates to the Conclusions, Goals, Policies, and Implementation Strategies. The NHMP identifies and examines the natural hazards facing the city of Medford and establishes a coordinated process (a plan) to implement actions to reduce impacts of natural disasters on the people and resources of the community. The Federal Emergency Management Agency (FEMA) requires an approved NHMP in order for a jurisdiction to be eligible for a number of major grant programs and other pre- and post-disaster assistance.

The Planning Commission reviewed the proposal at a study session on September 10, 2018, and formally considered the matter on September 27, 2018. At the hearing the commissioners voted (6-0) to forward a favorable recommendation to the City Council. (File No. CP-18-063)

PREVIOUS COUNCIL ACTIONS
The 2017 Natural Hazards Mitigation Plan was discussed at a City Council study session on August 25, 2016, and was adopted by the Council on September 7, 2017, per Council Bill 2017-105.

ANALYSIS
The proposed amendment would incorporate the 2017 Natural Hazards Mitigation Plan into the Comprehensive Plan and would update various sections of the Environmental Element with the information on the eight natural hazards analyzed in the NHMP. The amendment also updates the Comprehensive Plan's Conclusions, Goals, Policies and Implementation Strategies for Air Quality, and Disasters and Hazards.

FINANCIAL AND/OR RESOURCE CONSIDERATIONS
None.

TIMING ISSUES
None.

COUNCIL OPTIONS
- Approve the ordinance as presented
- Modify the ordinance as presented
- Decline to approve the ordinance as presented and direct staff regarding further action

STAFF RECOMMENDATION
Staff recommends approval of the ordinance.

SUGGESTED MOTION
I move to approve the ordinance authorizing the Comprehensive Plan Amendment as described in the Council Report dated October 25, 2018, and as recommended by the Planning Commission.

EXHIBITS
Ordinance
Council Report, including Exhibits A – I

ORDINANCE NO. 2018-125

AN ORDINANCE approving a legislative amendment to the Environmental Element and the Conclusions, Goals, Policies, and Implementation Strategies of the *Medford Comprehensive Plan* to incorporate the 2017 Natural Hazards Mitigation Plan.

WHEREAS, the City Council has determined that the 2017 Natural Hazards Mitigation Plan satisfied the applicable criteria as demonstrated by the Findings and Conclusions which are on file in the City of Medford Planning Department and incorporated herein by reference and which are hereby adopted as the findings and conclusions of the City Council; now, therefore,

THE CITY OF MEDFORD ORDAINS AS FOLLOWS:

Section 1. That the 2017 Natural Hazards Mitigation Plan, by reference, is hereby adopted as part of the *Medford Comprehensive Plan*.

Section 2. The approval is based upon the Findings and Conclusions included in the Council Report dated October 25, 2018, attached as Exhibit A and incorporated herein.

PASSED by the Council and signed by me in authentication of its passage this _____ day of _____, 2018.

ATTEST: _____ _____
City Recorder Mayor

APPROVED _____, 2018. _____
Mayor

COUNCIL REPORT

for a Type IV Land Use Action: **Comprehensive Plan Amendment**

Project	2017 Natural Hazards Mitigation Plan - Comprehensive Plan Amendment
File no.	CP-18-063
To	City Council *for 11/01/2018 hearing*
From	Planning Commission via Seth Adams, AICP, Planner III
Reviewer	Carla Angeli Paladino, Principal Planner
Date	October 25, 2018

PROPOSAL

Overview

CP-18-063 is a legislative amendment to incorporate by reference the *2017 City of Medford Natural Hazards Mitigation Plan* (NHMP) into the Environmental Element of the Comprehensive Plan, and to make related updates to the Conclusions, Goals, Policies and Implementation Strategies.

Authority

This proposal is a Type IV land use action to amend the Comprehensive Plan. The Planning Commission is authorized to recommend, and the City Council to approve, amendments to the Comprehensive Plan under Medford Municipal Code §§10.214 and 10.220.

BACKGROUND

Goal 7 (Areas Subject to Natural Hazards) of the *Statewide Planning Goals* requires local governments to consider natural hazards in their land use planning, and to adopt inventories, policies, and implementing measures in order to reduce the risk to people and property from natural hazards. As a result, the following natural hazard topics are currently identified and discussed in the Environmental Element of the Comprehensive Plan:

- Air Quality
- Flooding

- Landslides
- Earthquakes
- Wildland Fires

These same five natural hazards, along with severe weather, volcanic eruptions, and emerging infectious diseases, are also analyzed in the City's *2017 Natural Hazards Mitigation Plan* (NHMP), which examines the potential natural hazards that face the city of Medford. The NHMP also establishes a coordinated process (a plan) to implement actions to reduce impacts of natural disasters on the people and resources of the community.

The NHMP was first adopted in 2004 as a requirement of the Disaster Mitigation Act of 2000 which is implemented by the Federal Emergency Management Agency (FEMA). A stipulation of the law is that in order to receive pre- and post-disaster mitigation funds from FEMA, local governments must have a current, FEMA-approved NHMP. The City updated its NHMP in 2010, and then undertook an extensive analysis and re-writing of it between June 2016 and August 2017 in order to incorporate current scientific information, recent hazard event data, and other more current information. The process included a substantial amount of public outreach and participation, including local and regional input from a 19-person steering committee, community events and notices, interviews, an open house, and study sessions with the Planning Commission and City Council.

The new NHMP was adopted by the City Council on September 7, 2017 per Resolution No. 2017-105, and approved by FEMA on September 13, 2017. With FEMA's approval of the plan, the City maintains its eligibility for federal disaster mitigation funds, as well as additional points under the National Flood Insurance Program's Community Rating System (CRS). The adopted and approved Plan is effective through September 12, 2022.

ANALYSIS

Preparation of the 2017 NHMP resulted in mitigation plans for eight natural hazards. Similar to what was done with the Leisure Services Plan, the proposed amendment would incorporate (by reference) the 2017 NHMP into the Comprehensive Plan, and would update various sections of the Environmental Element to include information on all eight natural hazards analyzed in the NHMP (e.g. the Comprehensive Plan's section on Air Quality has not been updated for many years and therefore contains some information that is no longer accurate). Finally, the amendment updates the Comprehensive Plan's Conclusions, Goals, Policies and Implementation Strategies for Air Quality, and Disasters and Hazards.

FINDINGS AND CONCLUSIONS

For the approval criteria, Section 10.218 of the Medford Municipal Code redirects to the "Review and Amendment section of the Comprehensive Plan." The applicable criteria in this action are those for Conclusions, Goals and Policies, and Implementation Strategies. The criteria are set in *italics* below; findings and conclusions are in roman type.

Comprehensive Plan, Review and Amendments chapter: Amendments [to Conclusions] shall be based on the following:

1. *A change or addition to the text, data, inventories, or graphics which substantially affects the nature of one or more conclusions.*

   Findings

   The 2017 Natural Hazards Mitigation Plan (NHMP) has been updated to replace the prior plan completed in 2010, and includes current information on the natural hazards most likely to affect Medford and the Rogue Valley. Steady improvements in air quality over past decades has resulted in a change in the Medford-Ashland Air Quality Maintenance Area (AQMA) status from non-attainment to attainment, and the air pollutants of concern have changed in the time since the last update to the Environmental Element of the Comprehensive Plan. In addition, the number of potential natural hazards analyzed in the 2017 NHMP includes hazards that were not previously contemplated or discussed in the Comprehensive Plan.

   Conclusions

   The text and data related to Air Quality and Disasters and Hazards have been updated to reflect the current status of the Medford-Ashland AQMA and current pollutants of concern, and to acknowledge all of the hazards analyzed in the 2017 NHMP. The conclusions sections for Air Quality and Disasters and Hazards have also been updated to reflect these changes. This criterion is satisfied.

Comprehensive Plan, Review and Amendments chapter: Amendments [to Goals and Policies] shall be based on the following [criteria 1-6]:

1. *A significant change in one or more Conclusion.*

   Findings

   The conclusions section for Disasters and Hazards has been reviewed and revised to reflect all of the potential natural hazards that were analyzed and accounted for in the 2017 Natural Hazards Mitigation Plan (NHMP). In addition, the conclusions section for Air Quality has been revised to reflect the fact that the Medford-Ashland Air Quality Management Area has been in compliance with the federal carbon monoxide (CO) and particulate matter (PM_{10}) standards since 1991 and 1994, respectively; and, that Medford was re-designated by the Environmental Protection Agency as an attainment area for CO in 2002, and PM_{10} in 2006. In the time since,

pollutants of concern in the Medford-Ashland AQMA have changed to particulate matter ($PM_{2.5}$), ozone, and air toxics.

Conclusions

The conclusions section for Air Quality has been revised to acknowledge the change in status of the Medford-Ashland AQMA, as well as the current air quality pollutants of concern. The conclusions section for Disasters and Hazards has also been revised to include all of the natural hazards analyzed in the 2017 NHMP. This criterion is satisfied.

2. *Information reflecting new or previously undisclosed public needs.*

Findings

The 2017 Natural Hazards Mitigation Plan (NHMP) analyzed a total of eight natural hazards that are foreseeable as posing risk to the city. Of the eight hazards analyzed in the 2017 NHMP, three were not previously identified and/or included in the Disasters and Hazards section of the Environmental Element of the Comprehensive Plan. Information on these three natural hazards (severe weather, emerging infectious diseases, and volcanic eruptions) have been incorporated into the Comprehensive Plan, and the entirety of the 2017 NHMP is incorporated by reference.

Conclusions

The Environmental Element of the Comprehensive Plan has been revised to incorporate the 2017 NHMP by reference, and it includes updates and information on all eight of the natural hazards analyzed in the NHMP. This criterion is satisfied.

3. *A significant change in community attitude or priorities.*

Findings

The amendments to the Comprehensive Plan do not result from a change in community attitudes or priorities. Discussion of, and planning for natural hazards has always been part of the City's Comprehensive Plan. The amendment serves to incorporate the adopted Natural Hazards Mitigation Plan into the Comprehensive Plan for the first time.

Conclusions

This criterion does not apply.

4. *Demonstrable inconsistency with another Plan provision.*

Findings

The amendment addresses inconsistencies between information in the 2017 Natural Hazards Mitigation Plan (NHMP), and the Disasters and Hazards and Air Quality sections of the Environmental Element of the Comprehensive Plan. The inconsistencies are due to the fact that the information in the Comprehensive Plan has not been updated in many years and is thus out of date.

Conclusions

As part of the incorporation of the 2017 NHMP into the Comprehensive Plan, the summary, goals, policies, and conclusions sections of the Environmental Element have been revised to ensure consistency between the two documents. This criterion is satisfied.

5. *Statutory changes affecting the Plan.*

Findings

A stipulation of The Disaster Mitigation Act of 2000 is that in order to receive pre- and post-disaster mitigation funds from FEMA, local governments must have a current, FEMA-approved Natural Hazards Mitigation Plan (NHMP), and the plans must be updated and re-approved every five years. While there is no legal requirement to incorporate the NHMP into the Comprehensive Plan, it makes practical sense to do so and to ensure that both plans are consistent with one another.

Conclusions

The summary, goals, policies, and conclusions sections of the Environmental Element have been revised to incorporate the information contained in the City's most current NHMP. This criterion is satisfied.

6. *All applicable Statewide Planning Goals.*

Goal 1 - Citizen Involvement

Findings

The City has an adopted Citizen Involvement Element in compliance with Statewide Planning Goal 1. Notice of the amendment was provided to the Department of Land Conservation and Development for review and comment. The review bodies (Planning Commission and City Council) will consider and vote on the proposed amendment during televised public hearings, providing an additional forum to discuss the proposal.

Citizen input and involvement were also at the cornerstone for updating the Natural Hazards Mitigation Plan. At the start of the update the City formed a steering committee comprised of City staff, governmental agencies, community groups, and members of the public. Outreach was performed using a variety of methods during the update process, including email, website postings, printed flyers, community events, interviews, an open house, and briefings to the Planning Commission and City Council.

Conclusions

Based on the public engagement conducted during the update of the NHMP and the adoption of the amendment, Goal 1 is found to be satisfied.

Goal 2 – Land Use Planning

Findings

Goal 2 requires consistency between various plans and the Comprehensive Plan. The 2017 Natural Hazards Mitigation Plan (NHMP) reflects the most up to date discussion and analysis of the natural hazards most likely to impact Medford, and establishes a coordinated process to implement actions to reduce the impacts of those natural disasters. The plan has been reviewed and portions of the plan incorporated into the Environmental Element of the Comprehensive Plan. The entirety of the 2017 NHMP plan will be incorporated by reference into the Comprehensive Plan.

Conclusions

By incorporating the 2017 NHMP into the Comprehensive Plan, Goal 2 is found to be satisfied.

Goal 3 – Agricultural Lands, does not apply in this case.

Goal 4 – Forest Lands, does not apply in this case.

Goal 5 – Natural Resources, Scenic and Historic Areas, and Open Spaces, does not apply in this case.

Goal 6 – Air, Water and Land Resources Quality

Findings

Goal 6 requires Comprehensive Plans to provide for the maintenance and improvement of air resources. Air Quality and its effects on the City of Medford are analyzed in the 2017 Natural Hazards Mitigation Plan (NHMP) and the Environmental Element of the Comprehensive Plan. The NHMP is being incorporated into the Comprehensive Plan by reference, and portions of the Comprehensive Plan that directly address air quality have been updated to be consistent with the NHMP and to

acknowledge the change in status of the Medford-Ashland AQMA, as well as the current air quality pollutants of concern.

Conclusions

By incorporating the 2017 NHMP into the Comprehensive Plan and updating the portions of the Comprehensive Plan addressing air quality, Goal 6 is found to be satisfied.

Goal 7 – Areas Subject to Natural Hazards

Findings

Goal 7 requires local governments to adopt comprehensive plans to reduce risk to people and property from natural hazards. The 2017 Natural Hazards Mitigation Plan (NHMP) reflects the most up to date discussion and analysis of the natural hazards most likely to impact Medford, and establishes a coordinated process to implement actions to reduce the impacts of natural disasters. The plan has been reviewed and portions of the plan incorporated into the Environmental Element of the Comprehensive Plan. The entirety of the 2017 NHMP plan will be incorporated by reference into the Comprehensive Plan.

Conclusions

By incorporating the 2017 NHMP into the Comprehensive Plan, Goal 6 is found to be satisfied.

Goal 8 – Recreational Needs, does not apply in this case.

Goal 9 – Economic Development, does not apply in this case.

Goal 10 – Housing, does not apply in this case.

Goal 11 – Public Facilities and Services, does not apply in this case.

Goal 12 – Transportation, does not apply in this case.

Goal 13 – Energy Conservation, does not apply in this case.

Goal 14 – Urbanization, does not apply in this case.

Goals 15-19 do not apply to this region of the state.

Comprehensive Plan, Review and Amendments chapter: Amendments [to Implementation Strategies] shall be based on the following [criteria 1-6]:

1. *A significant change in one or more Goal or Policy.*

   Findings

   The Goals, Policies, and Implementation Strategies for Disasters and Hazards have been revised to reflect all of the natural hazards analyzed in the 2017 Natural Hazards Mitigation Plan, which is being incorporated into the Comprehensive Plan by reference.

   Conclusions

   By incorporating the 2017 NHMP into the Comprehensive Plan and revising the Goals, Policies, and Implementation Strategies to be consistent with the information in the NHMP, this criterion is found to be satisfied.

2. *Availability of new and better strategies such as may result from technological or economic changes.*

   Findings

   It is noted in the 2017 Natural Hazards Mitigation Plan that, due in large part to advances in motor vehicle technology, the Medford-Ashland AQMA is now under a maintenance plan for carbon monoxide (CO) and particulate matter (PM_{10}) and that the current pollutants of concern are $PM_{2.5}$, ozone, and air toxics. In addition, recent fire seasons allude to more active wildfires in the future, and those fires are likely to increase air pollution even as emissions from industry and motor vehicles have fallen. In acknowledging these changes, the plan highlights the need for continued monitoring of risks from natural hazards and the pursuit of mitigation strategies.

   Conclusions

   By incorporating the 2017 NHMP into the Comprehensive Plan and revising the Goals, Policies, and Implementation Strategies for consistency, this criterion is found to be satisfied.

3. *Demonstrable ineffectiveness of present strategy(s).*

   Findings

   The Natural Hazards Mitigation Plan was last updated in 2010. In order to ensure and maintain a coordinated process to implement actions to reduce the impacts of natural disasters, the plan has been updated. There is no finding that the present strategies were ineffective.

Conclusions

This criterion is found to be not applicable to the proposal.

4. *Statutory changes affecting the Plan.*

Findings

This criterion has been addressed in Criterion 5 above.

Conclusions

This criterion is found to be satisfied based on the findings noted in Criterion 5 above.

5. *Demonstrable budgetary constraints in association with at least one of the above criteria.*

Findings

There are no specific budgetary constraints associated with the incorporation of the 2017 Natural Hazards Mitigation Plan into the Comprehensive Plan.

Conclusions

This criterion is found to be not applicable to the proposal.

6. *All applicable Statewide Planning Goals.*

Findings

The relevant Statewide Planning Goals have been addressed in detail under Criterion 6 above. The plan is found to be in compliance with the goals.

Conclusions

The Statewide Planning Goals have been addressed above. This criterion is found to be satisfied.

RECOMMENDED ACTION

Based on the Findings and Conclusions that all of the approval criteria are either satisfied or not applicable, adopt the ordinance for approval of CP-18-063 per the Council Report dated October 25, 2018, including Exhibits A through I.

EXHIBITS

A 2017 City of Medford Natural Hazards Mitigation Plan*
B Amended Environmental Element
C Amended Conclusions, Goals, Policies and Implementation Strategies
D Excerpt of Planning Commission Minutes, September 27, 2018

E Excerpt of Planning Commission Study Session Minutes, September 10, 2018
F City Council Resolution No. 2017-105
G Excerpt of Planning Commission Study Session Minutes, February 27, 2017
H Excerpt of City Council Study Session Minutes, August 25, 2016
I Excerpt of Planning Commission Study Session Minutes, August 22, 2016

*The Natural Hazards Mitigation Plan can also be found on the Planning Department's "Document Center" webpage.

CITY COUNCIL AGENDA: **NOVEMBER 1, 2018**

ENVIRONMENTAL ELEMENT

~~Prepared by~~
City of Medford ~~Planning Department~~
~~200 South Ivy Street~~411 West Eighth Street
Medford, Oregon 97501
planning@cityofmedford.org

~~James E. Huber, AICP, Planning Director~~

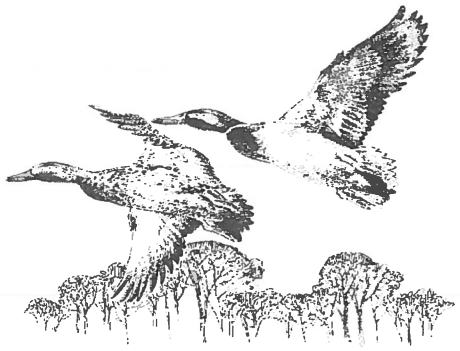
~~COMPREHENSIVE PLANNING SECTION~~

~~John Adam, AICP, Principal Planner~~
~~Jennifer Jones, AICP, Planner III~~
~~Praline McCormack, Planner II~~
~~Chris Olivier, GIS Coordinator~~
~~Carla Angeli Paladino, Planner IV~~

Revised by
MEDFORD CITY COUNCIL
~~February 4~~XXXXXXXX, 201~~6~~8
Ordinance No. 201~~6~~8-~~020~~

INTRODUCTION

PURPOSE



An issue in many Northwest communities is the declining environmental quality that accompanies urban growth. The Bear Creek Valley has an abundance of diverse natural resources that provide recreation, wildlife habitat, and valuable urban open space, and contribute to the quality of life in Medford. Urbanization has negatively impacted the valley's natural resources, and, therefore, our quality of life. Diminishing supplies of developable land have forced many communities such as Medford to face the difficult challenge of balancing natural resource protection with the needs and rights of property owners and competing land uses. The impacts of development on the natural environment and its scenic values are evident. Cities, farms, drainage projects, dams, channelized streams, and roads have shaped the local landscape. In many instances, development has out-stepped environmental planning efforts.

This "Environmental Element" of the *Medford Comprehensive Plan* provides goals, policies, and implementation strategies for improving and maintaining environmental quality in Medford, while accommodating continued growth. The *Statewide Planning Goals* that oversee the protection and conservation of natural resources in Oregon are *Goal 5: Open Spaces, Scenic and Historic Areas, and Natural Resources*, and Goal *6: Air, Water and Land Resources Quality*. Consistent with the objectives of Goals 5 and 6, the "Environmental Element" is a guiding document that strives to protect the natural environment and ensure that long-term growth does not adversely affect the natural resources that contribute to Medford's livability. Other *Statewide Planning Goals* that are pertinent to the "Environmental Element" include *Goal 3: Agricultural Lands*; *Goal 7: Areas Subject to Natural ~~Disasters and~~ Hazards*; and *Goal 13: Energy Conservation*. Most of these *Statewide Planning Goals* are also addressed in other elements of the *Comprehensive Plan*, such as in the "Public Facilities Element," and in related plan documents such as the *Medford Parks, Recreation, and Leisure Services Plan*, and the *City of Medford Natural Hazards Mitigation Plan*.

An overriding concept in the goals, policies, and implementation strategies in this element is to incorporate *preventive*, rather than *corrective* measures in land use planning. The goals, policies, and implementation strategies emphasize the importance of developing and maintaining an integrated open space system that incorporates parks and recreation, biological resources, agriculture, and waterways. They must be evaluated and updated regularly, with new information added to the "Environmental Element" as necessary.

* * *

NATURAL RESOURCES

Goal 6 of Oregon's *Statewide Planning Goals*, "Air, Water, and Land Resources Quality," strives *"to maintain and improve the quality of the air, water, and land resources of the state."* This section of the "Environmental Element" discusses Medford's natural resources, including air quality, water quality, wetlands, wildlife habitat, soils, and energy, and presents the conclusions, goals, policies, and implementation strategies pertinent to these factors. Because water quality, wetlands~~, and~~, and wildlife habitat are interrelated, their Conclusions and Goals, Policies and Implementation Measures are combined.

AIR QUALITY

Statewide Planning Goal 6 requires Comprehensive Plans to provide for the maintenance and improvement of air resources. In air sheds, such as Medford's, that are *"described or included in state environmental quality statutes, rules, standards and implementation plans"* air emissions *"shall not (1) exceed the carrying capacity of such resources, considering long range needs; (2) degrade such resources; or (3) threaten the availability of such resources."*[1]

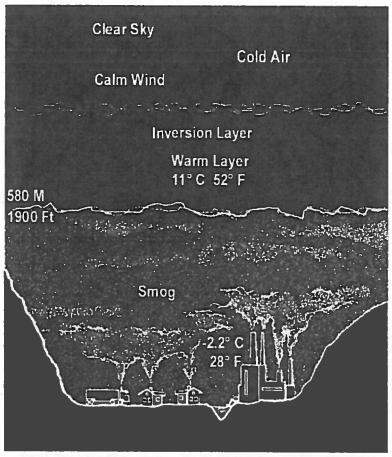
In the past, the largest sources of air pollution in the region included industry and wood stoves, which emit particulate matter and carbon monoxide. Substantial efforts (discussed below) have been made to reduce these emissions. More recently, concerns for air quality arise when smoke from regional wildfires either blows through the valley or becomes trapped during inversions. ~~motor vehicle emissions have become the major source of air pollution. According to one source, *"Motor vehicles are the single largest source of ozone and carbon monoxide emissions in the United States today. Cars, buses, and trucks are responsible for 50 percent of the smog, and 90 percent of the carbon monoxide that exists in urban areas."*[2]~~ Wood stove, industrial, and motor vehicle emissions continue to be a major source of air pollution. A definite contributing factor to traffic congestion is Medford's role as a regional retail, health, and service center. ~~Medford is prone to accumulations of air pollution from motor vehicle emissions.~~ As noted previously, Medford provides services to an estimated population of 400,000 to 450,000, thereby exacerbating traffic congestion and the accumulation of air pollution from motor vehicle emissions. The ~~high~~ number of commuters traveling to Medford for work, services, education, and recreation will continue to increase in the future, especially from outlying communities such as Ashland, Grants Pass, and ~~even~~ Yreka, California~~, affecting Medford's air quality~~.

~~As noted in the *Physical Characteristics* section, historically,~~ Given its bowl-like shape, the Rogue Valley~~, from Ashland to Grants Pass, has had a high propensity toward~~experiences periods of air stagnation and atmospheric temperature inversions that trap pollution, particularly during the

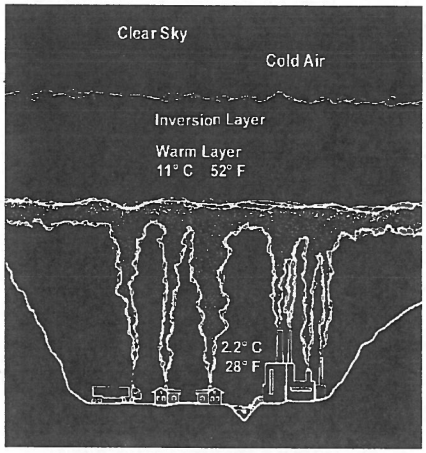
[1] *Oregon's Statewide Planning Goals and Guidelines, ~~1995~~2010 Edition*, Oregon Department of Land Conservation and Development.

~~[2] *Clean Air Act: Law and Explanation*, Commerce Clearing House, Inc., 1990.~~

months of November, December, January, and February. During these months, the temperature near the ground decreases rapidly toward sunset. As the surface air cools, it flows down the mountain slopes, forming a pool of cold air on the valley floor with the warmer air above acting



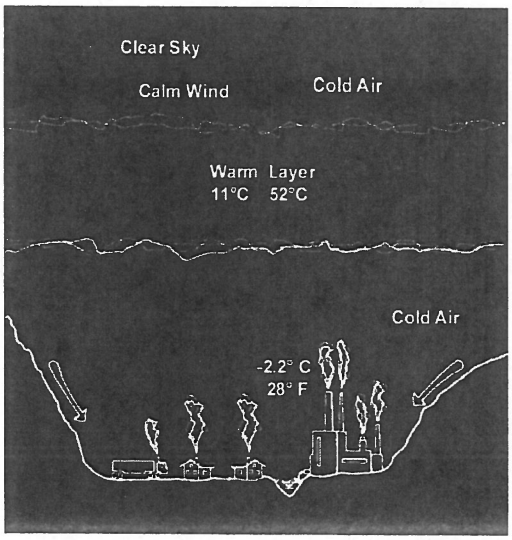
As nighttime comes, the surface air cools and moves down into the valley.

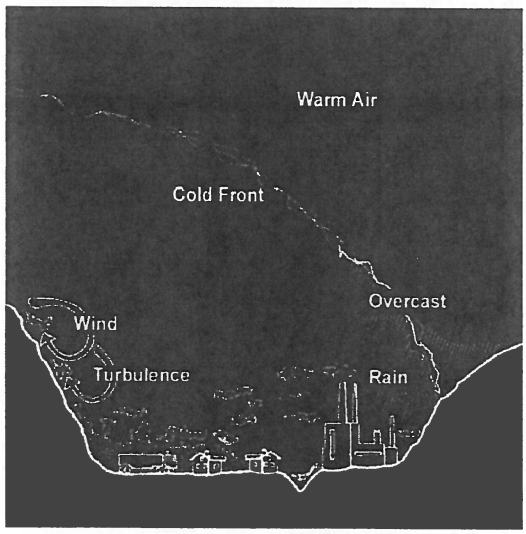


During the day, emissions rise, but become trapped by the warm air layer above.

as a lid. The cooling within this layer typically produces fog, and, as air pollutants are discharged, they become trapped. During these stagnant conditions, the fog and trapped air can remain under this "lid" for several days, becoming increasingly polluted. **Figure 1** illustrates the temperature inversion process.

Figure 1: Temperature Inversion





Since there is no wind to carry the emissions away, the pollution remains under the "lid" of warmer air, accumulating until the inversion layer is broken up.

Breakup of the inversion layer may come from increased temperatures during the day, which increases the depth of the mixing layer, or from the arrival of a new air mass accompanied by stronger wind and precipitation.

~~Currently, local and state agencies are working to develop an air quality plan for the region that will not only maintain federal air quality standards, but continue to improve air quality, while satisfying the provisions of the *Statewide Planning Goals*. The City of Medford has also begun undertaking preventive strategies to reduce motor vehicle emissions. For example, mixed residential and commercial development, which lessens the number and length of auto trips for work or shopping, is being required in areas such as Southeast Medford.~~

~~The Rogue Valley Transportation District (RVTD) is one of the local agencies who is active in air quality issues through their efforts to reduce single occupancy vehicle trips and their use of compressed natural gas to fuel their buses. Mass transit vehicles operating on compressed natural gas are virtually non-polluting. Other public and private entities in the Medford-Ashland AQMA have turned to use of compressed natural gas as a fuel source, including Jackson County and Avista Utilities Company.~~

FEDERAL AND STATE REGULATIONS

~~Federal "Clean Air" legislation began in 1950s, and has undergone subsequent amendments, including revisions in 1960s, 1970s, and 1990s. While initial legislation concentrated on satisfying federal air quality standards, more recent revisions have incorporated the critical role of transportation planning in maintaining and improving air quality. In 1955, Congress took the first step in implementing regulations to improve air quality by passing the *Air Pollution Act*, which authorized the first federally funded air pollution research. Later, the passage of the *Motor Vehicle Pollution Control Act of 1965* expanded federal activity to include setting emission standards for automobiles.~~

~~In 1967, the *Air Quality Act* became law, followed in 1969 by the *National Environmental Policy Act* (NEPA), which established the Council on Environmental Quality.~~ The *Clean Air Act of 1970* established the existing system of national air quality standards, and issued a generalized compliance schedule to all states. ~~In the 1970 amendments,~~ It requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. ~~were developed for seven major pollutants.~~ The EPA has set NAAQS for seven~~seven~~ principal pollutants, which are called "criteria" air pollutants. The seven "criteria" pollutants are: carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$), ozone (O_3), ~~assigned NAAQS were total suspended particulate (TSP),~~ sulfur dioxide~~s~~ (SO_x~~$_2$~~), ~~carbon monoxide (CO), hydrocarbons (HC),~~ nitrogen dioxide (NO_2), ~~photochemical oxidants (O_x),~~ and lead (Pb). As part of the *Clean Air Act*, states were required to develop State Implementation Plans (SIPs) for attaining and maintaining the NAAQS.

The federal Environmental Protection Agency (EPA) is responsible for approving or disapproving SIPs. Although the 1970 *Clean Air Act* established the NAAQS, many jurisdictions concentrated on attaining standards through emission controls, instead of fully addressing the prevention of air pollution and maintenance of air quality on a broad, regional level. In the early 1970s, the EPA disapproved all SIPs because many lacked effective mechanisms for maintaining federal standards. The EPA required states to identify areas that had air quality problems or where future growth rates would result in exceeding the NAAQS as "Air Quality Maintenance Areas" (AQMAs). The Medford-Ashland area was designated as an AQMA in 1974, encompassing the communities of Medford, Ashland, Central Point, Phoenix, Talent, White City, Eagle Point, and Jacksonville (228 square miles). The Oregon Department of Environmental Quality (DEQ) was given primary responsibility for enforcing air quality standards in Oregon.

An AQMA that does not meet the NAAQS for a particular pollutant is labeled a "non-attainment area" for that pollutant. ~~**Figure 2** illustrates the steps in developing a SIP in a non-attainment area under the *Clean Air Act*.~~ Strategies for bringing the AQMA into compliance are required as a component of the SIP, as is a detailed analysis of the impact of projected future growth on air quality. Where the analysis indicates that an area may not maintain the NAAQS for the ten years after attainment, the state is required to submit an Air Quality Maintenance Plan.

~~Comprehensive amendments to the *Clean Air Act* in 1977 mandated significant involvement by local governments and elected officials in the development, implementation, and enforcement of plans to attain the NAAQS. The increased responsibility of local governments was identified specifically for areas subject to transportation-related photochemical oxidants (ozone or "smog") and carbon monoxide standards that would not be met before 1979. In 1978, the Jackson County Board of Commissioners was identified as the lead agency responsible for controlling mobile air pollution sources in Jackson County. They appointed an Air Quality Advisory Committee to make recommendations on transportation-related air quality control measures for the Medford-Ashland AQMA.~~

~~Congress again amended the *Clean Air Act* in 1990, resulting in stricter standards and deadlines for compliance for non-attainment areas, with tougher sanctions for those areas that did not comply. A more recent requirement for non-attainment areas in Oregon is the *Oregon Transportation Conformity Rule*, approved by the state Environmental Quality Commission in April 1995. The *Transportation Conformity Rule* requires jurisdictions to consider air quality in transportation planning, or risk suffering a loss of federal funding and potentially violating the NAAQS in the future. For example, a "particulate matter conformity determination" must be made for future, regionally significant transportation projects in Jackson County. In 1998, additional amendments to the *Clean Air Act* set new standards for particulate matter and ozone.~~

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Figure 2
Steps to Developing a State Implementation Plan (SIP) Under the Clean Air Act

(1) National Ambient Air Quality Standards (NAAQS) promulgated by Environmental Protection Agency (EPA).

(2) States and EPA collect/evaluate ambient air quality data.

(3) EPA/states designate and classify areas based on NAAQS attainment status. *If area in attainment, no new SIP required.*

(4) If area found in non-attainment for one or more pollutant, SIP required.

(5) States develop emissions inventory.

(6) States develop SIP, consisting of rules, mobile source strategies, etc., to attain standards by *Clean Air Act* deadline.

(7) States demonstrate to EPA that SIP works, usually through modeling.

(8) States hold public hearing, adopt SIP, and submit to EPA for review and approval.

(9) SIP completeness determined by EPA within six months.

(10) If incomplete, SIP sent back to state to revise and re-submit; *OR*, if complete, EPA must approve, disapprove, or develop Federal Replacement SIP.

Source: Rogue Valley Council of Governments, 1997

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AIR QUALITY MAINTENANCE AREA STATUS

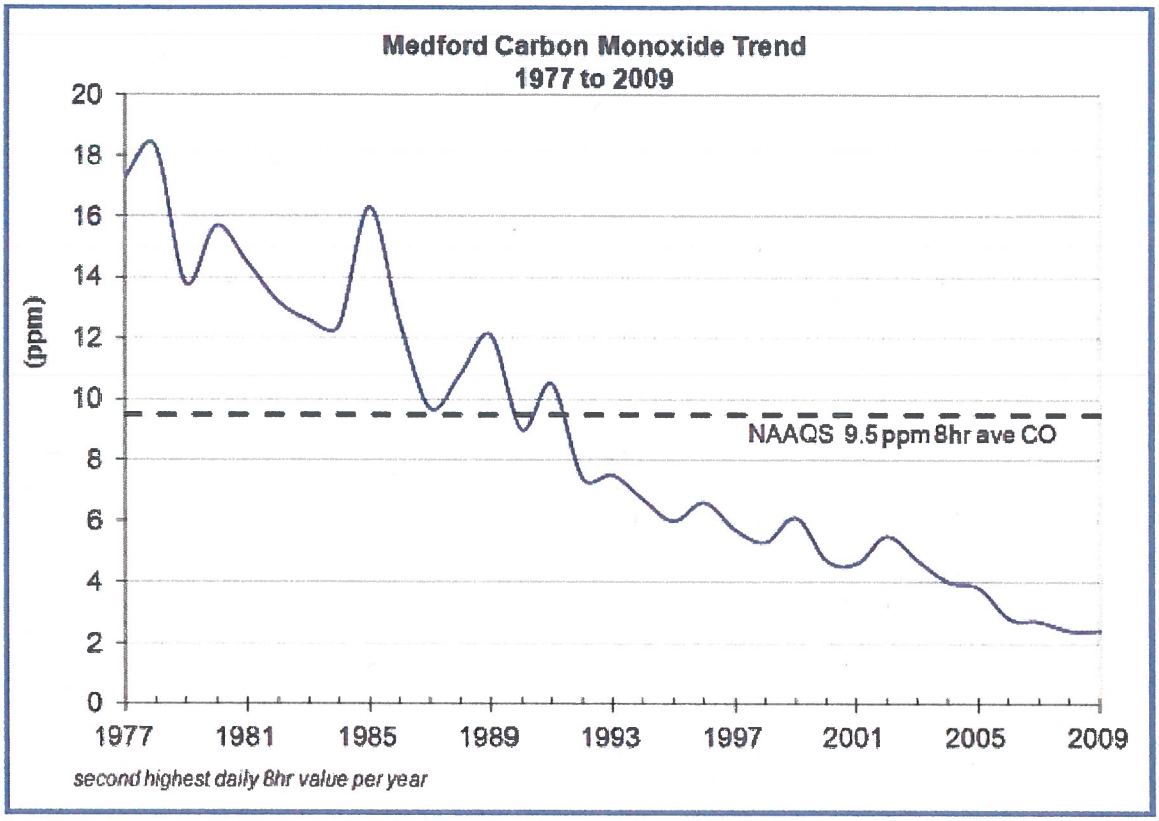
The Medford UGB was established as the non-attainment boundary for carbon monoxide (CO) in 1978, and, in 1987, the Medford-Ashland AQMA was designated as the non-attainment boundary for particulate matter (PM_{10}). As required by federal law, SIPs were prepared for these two pollutants that exceeded the NAAQS in the Medford-Ashland AQMA.

Carbon Monoxide (CO)

Carbon monoxide is a colorless, odorless gas that decreases the oxygen carrying capacity of the blood. High concentrations can severely impair the function of oxygen-dependent tissues, including the brain, heart, and muscle. Prolonged exposure to even low levels can aggravate existing conditions in people with heart disease or circulatory disorders. High levels of CO have traditionally been caused by emissions from motor vehicles.

Largely due to improvements in modern vehicle emission control systems, ~~A SIP for CO was developed in 1982 by Jackson County, and later approved by the EPA~~CO levels have progressively improved in the years since the designation of the Medford-Ashland AQMA, and Medford has not violated the CO standard since 1991. In 2001 the State of Oregon submitted a ten-year CO Maintenance Plan to EPA and requested that Medford be re-designated to attainment. EPA approved the request as a revision to the SIP of September 23, 2002, and a second ten-year CO Maintenance Plan has been prepared by DEQ indicating how Medford will continue to maintain the CO standard through September 23, 2022. **Figure 2** depicts the trend in carbon monoxide levels in Medford between the years 1977 and 2009. The majority (72%) of the CO air emissions in the Medford UGB can be attributed to motor vehicles, residential wood combustion, and prescribed burning.~~However, the SIP for PM_{10}, developed in 1991, was not approved, and has been withdrawn.~~

Figure 3
Medford Carbon Monoxide Trend 2nd highest 8-hour average, 1977-2009



Source: *Medford Carbon Monoxide Limited Maintenance Plan, December 2015,* Oregon Department of Environmental Quality

The CO Maintenance Plan relies on the following control measures for continued attainment of the NAAQS:

- Federal motor vehicle emission standards for new motor vehicles
- Use of Best Available Control Technology (BACT) for new or expanding major industry
- Oregon Vehicle Inspection Program (i.e. emissions testing and inspection) for vehicles up to 20 years old
- Emission certification for new wood stoves, wood stove change-out programs, and a voluntary curtailment program to reduce wood burning during stagnant weather periods.

Particulate Matter (PM_{10})

There have been several PM_{10} plans developed for the Medford-Ashland AQMA. The initial Attainment Plan adopted in 1991 contained a suite of emission reduction strategies that brought the area into compliance with PM_{10} standards by the required Clear Air Act deadline of December 31, 1994. The PM_{10} Attainment Plan was updated in 1998 and 2004, and the Medford-Ashland AQMA was re-designated to attainment by the EPA in 2006. The 2004 Plan included a PM_{10} Maintenance Plan for the AQMA, the objective of which is to continue the successful PM_{10} strategies for the AQMA in order to ensure continued compliance with PM_{10} standards. The ~~A revised SIP for PM_{10} and an Air Quality Maintenance Plan for CO are currently being developed. Representatives from industry, government, and public interest organizations comprise the local working group (Medford-Ashland Air Quality Advisory Committee) overseeing the development~~

~~of these two plans.~~

~~The original emission control measures in the PM_{10} SIP included the following:~~

- ~~Mandatory woodstove curtailment program~~
- ~~Industrial source control technology requirements~~
- ~~Local open burning ordinances~~
- ~~Slash burning restrictions on "red days"~~
- ~~Cleaner road sanding materials~~

~~New~~ emission control measures ~~recommended by~~contained in the SIP for PM_{10} in ~~the~~ Medford-Ashland Air Quality ~~Advisory Committee include~~Maintenance Area are:

- ~~Unified woodstove curtailment program for all jurisdictions in the AQMA~~A mandatory woodstove curtailment program.
- ~~Roadway paving projects in Medford and White City~~Emission limit standards for existing industrial processes.
- ~~Education program regarding "track out"[3] for orchard owners~~
- ~~Unified "track out" ordinance for all jurisdictions in the AQMA~~
- ~~Improved street vacuuming programs in Medford and White City~~
- ~~New industrial toxic air emission control standards~~
- Enhanced road cleaning program in Medford and White City.
- Management of prescribed forestry burning year round, and special protection for the Rogue Valley during the winter months.

The plan also continues the strictest requirements for managing emissions growth from future new and expanding major industry under the New Source Review (NSR) program. These include:

- A very low emission threshold level (5 tons/year) for triggering NSR.
- The requirements to install state-of-the-art emission control technology.
- The requirement to obtain emission offsets and demonstrate an air quality benefit (20% improvement in air quality).

NATIONAL AMBIENT AIR QUALITY STANDARDS

Air pollution reduction efforts have succeeded in reducing emissions in the Medford-Ashland AQMA due to increased public awareness and proactive programs, but the potential to revert to previous conditions still exists. The topography of the Rogue Valley, the abundance of motor vehicles, and the continued growth in population in the region are all factors that contribute to the potential for poor air quality.
~~Moreover, the 1998 revisions to the *Clean Air Act*, making the NAAQS stricter for both ozone and~~

[3] ~~Track-out describes dirt and mud deposited onto streets and roads from equipment and vehicle tires.~~

~~PM_{10}, could result in future violations.~~

Federal air quality standards were developed to address health, safety, and welfare concerns. The NAAQS are divided into two levels, "primary" and "secondary." *Primary* standards are designed to protect the public health with a built-in margin of safety. *Secondary* air quality standards, which are more stringent than primary standards, are designed to protect the public welfare from adverse effects, such as injury to crops and livestock, decreased visibility, deterioration of materials and property, and other types of environmental damage. Oregon's air pollution control strategies are directed to meet the more stringent *secondary* air quality standards. Where the secondary standard is identical to the primary standard, the primary standard is also protective of public welfare. **Figure 3** displays the ambient air quality standards currently in effect in Oregon.

Figure 3
State and National Ambient Air Quality Standards

Pollutant	Average Time	Primary (Health)	Secondary (Welfare)	Proposed Standard
Carbon Monoxide (CO)	8 hours 1 hour	9 ppm 35 ppm	9 ppm 35 ppm	NA
Lead (Pb)	Calendar Quarter	1.5 mg/m^3	1.5 mg/m^3	NA
Nitrogen Dioxides (NOx)	Annual Arithmetic Mean	.053 ppm	.053 ppm	NA
Ozone (O_3)	1 hour	.12 ppm	.12 ppm	.08 ppm
Sulfur Oxides (SOx)	Annual Arithmetic Mean 24 hours 3 hours	.03 ppm .14 ppm .50 ppm	.02 ppm .10 ppm .50 ppm	NA
Particulate Matter (PM_{10})	Annual Arithmetic Mean 24 hours	- -	50 mg/m^3 150 mg/m^3	15 mg/m^3 -* 65 mg/m^3 -*
Total Suspended Particulate (TSP)	Annual Geometric Mean 24 hours	NA NA	60 mg/m^3 150 mg/m^3	NA

Pollutant	Averaging Time	National Ambient Air Quality Standard (NAAQS) Violation Determination	Primary NAAQS Exceedance Level	Secondary NAAQS Exceedance Level
Carbon monoxide	1-hour	Not to be exceeded more than once/year.	35 ppm	-
	8-hour	Not to be exceeded more than once/year.	9 ppm	-
Lead	Three Months	Rolling 3 Month Average	0.15 $\mu g/m^3$	0.15 $\mu g/m^3$
Nitrogen dioxide	Annual	Annual arithmetic mean	53 ppb	53 ppb
	1-hour	3yr average of the maximum daily 98th percentile one hour average.	100 ppb	-
Ozone	8-hour	3-year average of the annual 4th highest daily maximum 8-hour average.	0.070 ppm	0.070 ppm
PM2.5	24-hour	3-year average of the 24 hour average daily 98th percentile.	35 $\mu g/m^3$	35 $\mu g/m^3$
	Annual Average	3-year average of the annual arithmetic mean	12 $\mu g/m^3$	12 $\mu g/m^3$
PM10	24-hour	Not to be exceeded more than once per year on average over 3 years.	150 $\mu g/m^3$	150 $\mu g/m^3$
Sulfur dioxide	1-hour	3yr average of the maximum daily 99th percentile one hour average.	75 ppb	-
	3-hour	Not to be exceeded more than once per year.	-	0.5 ppm

Notes: **$\mu g/m^3$** = *micrograms of pollutant per cubic meter of air*
ppm = *parts per million*
ppb = *parts per billion*

Source: ~~1995~~2016 Oregon Air Quality Annual ~~Data Summary~~Report, *Oregon Department of Environmental Quality~~, Air Quality Division~~*

~~Notes: Oregon standards are the same as the federal secondary standards.~~
~~ppm = parts per million~~
~~mg/m3 = micrograms per cubic meter~~
~~NA = not applicable~~
~~*These are the new standards for $PM_{2.5}$. It is expected that there will be stricter standards developed for PM_{10} as well.~~

While there are NAAQS for seven pollutants, there are currently three pollutants of significant concern for Medford: ozone, ~~carbon monoxide, and~~ particulate matter ($PM_{2.5}$), and air toxics. At present, the DEQ does not have any air toxics monitors in SW Oregon.

Ozone (O_3)

Ozone is part of the ozone layer in the earth's stratosphere. Ozone is harmful outside of the ozone layer in the lower atmosphere, and at that point it is often referred to as ~~(~~smog, ground level ozone, or ozone pollution. Ozone ~~)~~typically forms on days when the temperature ~~exceeds 95 degrees and there is a high volume of motor vehicle traffic~~is warm and stable, typical conditions during the summer in Medford. ~~According to data in the *Jackson County Air Quality Annual Report, 1995-1996*, the annual average ozone level in Medford was below the proposed new higher standard of~~

~~.08 parts per million (ppm) for several years; however, several days in July and September of 1998 exceeded the existing standard of .12 ppm. Continued population growth and its accompanying traffic increases could lead to more violations of the federal and state standards in the future~~Ground level ozone is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NO_x and VOC. Breathing ozone can trigger a variety of health problems, particularly for children, the elderly, and people of all ages who have lung diseases such as asthma. Ground level ozone can also have harmful effects on sensitive vegetation and ecosystems. While ozone levels have declined in Medford since 2007, a slight uptick was measured in the 2013-2015 timeframe.

~~**Carbon Monoxide (CO)**~~

~~The NAAQS for carbon monoxide was exceeded throughout most of the 1980s in Medford, yet levels have decreased in recent years. CO, a colorless, odorless, deadly gas that interferes with the body's ability to use oxygen, is produced by all forms of combustion, including motor vehicle internal combustion engines. Between 1991 and 1999, CO standards were exceeded in the AQMA only once (in 1994) due to a car rally event in Medford. This was not considered a violation because it occurred only once. Sources of CO emissions include mobile "non-road" and "on-road" sources. *Non-road* sources include equipment, off-road vehicles, aircraft, and railroads. *On-road* sources are gas and diesel vehicles and trucks driven on roads. "Light duty gas vehicles" (generally cars) account for nearly 66% of CO emissions within the Medford AQMA, and most CO emissions occur on arterial streets.[4] Monitoring systems for CO have been installed by the DEQ in Medford at two highly congested areas - near the Rogue Valley Mall and at Main Street and Central Avenue.~~

Particulate Matter (~~PM_{10} and~~ $PM_{2.5}$)

The *Clean Air Act* requires the EPA to review and revise air quality standards to ensure that citizens are protected from the harmful effects of air pollution. "Particulate matter" comes mostly from smoke, dust, and vehicle exhaust. ~~The current standard for particulate set i~~In 1987, standards were established by the EPA for particulate matter particles ~~covers particles that~~ that are 10 microns or less in diameter (PM_{10}). A comprehensive review of the human health effects of PM_{10} revealed that the standards were not sufficient to protect human health. Health studies show harmful effects from breathing particles as small as 2.5 microns in diameter ($PM_{2.5}$). This smaller particle is inhaled deeper into the lungs and can potentially cause more damage than larger particles. Standards for ~~The new~~ $PM_{2.5}$ were established in 1997 for 24 hour and annual levels, and in 2006 the $PM_{2.5}$ levels for daily average levels were significantly reduced from 65ug/m^3 to 35ug/m^3. Medford trends close to the $PM_{2.5}$ standard in both daily and annual average levels. ~~standard will require new monitoring equipment to collect data. According to the Oregon DEQ, any population center in the state may potentially violate the new $PM_{2.5}$ standards. Particular areas of concern include Bend, Eugene-Springfield, La Grande, Portland, Grants Pass, and Medford. Areas designated as out of compliance will have up to ten years to attain the new standards.[5]~~

~~[4] *Oregon 90 SIP: Introduction and Overview*, Draft Plan.~~

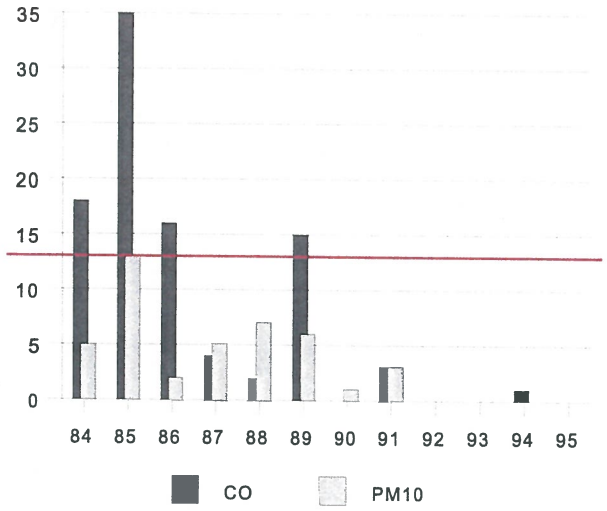
~~[5] *Proposed New Air Standards and How They Might Affect Oregon Communities*, U.S. Environmental Protection Agency, December, 1996.~~

In 1989, Jackson County began programs to improve PM_{10} levels, including regulating industry, outdoor burning, and wood stoves to reduce the regional smoke problem. The most heavily polluted areas had more than double the hazardous level of PM_{10}.[6] The more populated areas, such as Medford, were especially affected, although all portions of Jackson and Josephine Counties were affected to some degree. The severity of the wood smoke problem has decreased in recent years because of the smoke reduction measures and a decline in the wood products industry. PM_{10} levels have been drastically reduced, to roughly 12.5% of their 1989 levels. The last exceedance of the 24-hour PM_{10} standard in the Medford area occurred in 1991. The more recent standards for $PM_{2.5}$ will create further challenges for the Medford-Ashland AQMA, however.

Land use strategies, implemented through the *Land Development Code* and *Comprehensive Plan*, such as those that reduce vehicle miles traveled (VMT) and retain vegetation can assist in achieving and maintaining compliance with the new standards. The present primary contributor of PM_{10} is road dust from use by motor vehicles (55%), although industry (24%) could once again become a significant contributor according to DEQ.

Figure 4 lists a history of the air quality status of the two pollutants (CO and PM10) in violation of the NAAQS in the Medford-Ashland AQMA. While the reduction in the number of days of NAAQS violations is notable, the region is still considered a non-attainment area, since the AQMA has no federally-approved SIP for PM_{10}.

Figure 4
Number of Days Exceeding the NAAQS for CO and PM_{10}
Medford-Ashland AQMA, 1984-1995



[6] *Jackson County Air Quality 1995/96 Annual Report*, Jackson County Environmental Health Division.

~~Source: *Jackson County Air Quality Annual Report, 1995-96.*~~

Air Toxics

There are 188 air toxics, about 50 of concern, in Oregon. DEQ has monitored for air toxics in Medford in the past, but this monitoring was only temporary and is moved around the state. According to DEQ, air toxics include diesel soot, benzene, polycyclic aromatic hydrocarbons (tar-like by-products from auto exhaust and other sources), and metals including manganese, nickel and lead. Air toxics come from a variety of sources including cars and trucks, all types of burning (including fireplaces and wood stoves), businesses, and consumer products. Air toxics are air pollutants known or suspected to cause cancer or other serious health problems. National and state studies indicate that Oregonians are exposed to a number of air toxics at potentially harmful levels.

~~AIR QUALITY IMPROVEMENT PROGRAMS~~

~~As noted, air quality in the Medford-Ashland AQMA has improved dramatically in recent years, due, in part, to programs implemented in Medford and the Rogue Valley to reduce emissions and bring the area into attainment with the NAAQS. Although air quality has improved, there is a continuing need for the programs, especially with the arrival of the EPA's stricter 1998 provisions. Each air quality improvement program is briefly described in the following section.~~

- ~~Vehicle Inspection and Maintenance (I & M) Program~~
- ~~Oxygenated Fuel Program~~
- ~~Small Business Assistance Program~~
- ~~Woodstove Certification Program~~
- ~~Woodstove Replacement Program~~
- ~~Liaison Activities~~
- ~~Daily Wood Stove Advisory~~
- ~~Outdoor Burning Regulations~~
- ~~Public Education~~
- ~~Congestion Mitigation and Air Quality Improvement Program (CMAQ)~~
- ~~Traffic Signal Timing Program~~

~~Vehicle Inspection and Maintenance (I & M) Program~~

~~All motor vehicles, with few exceptions, belonging to residents of the Medford-Ashland AQMA are required to be tested for excessive emissions through the state Vehicle Inspection and Maintenance (I & M) Program. The vehicles must meet specific standards each time licensing is required.~~

Oxygenated Fuel Program

In 1992, the *Clean Air Act* began requiring the sale of oxygenated fuel during the winter in Jackson County, Grants Pass, and Klamath Falls, along with Multnomah, Clackamas, Washington, and Yamhill Counties, to reduce CO emissions. CO comes chiefly from motor vehicle exhaust, and can reduce the ability of the human body to process oxygen. The "oxy-gas" program is in effect from November 1 through February 28, the season with typically the worst air quality conditions.

Small Business Assistance Program

The Small Business Assistance Program provides information and technical assistance to small businesses regarding air quality regulations and related environmental issues. Small businesses that produce air emissions, such as dry cleaners, auto body shops, printers, and small manufacturers, must address regulations in the *Clean Air Act*, and this program is designed to help them meet the most recent emission standards. The program, administered by the Oregon DEQ, is educational and informational in nature, and does not provide any direct financial assistance to the businesses.

Oregon's Wood Stove Certification Program

In 1983, the Oregon legislature mandated a Wood Stove Certification Program to assure use of wood stoves that were less polluting. By 1986, only wood stoves certified as meeting new emission standards were permitted to be sold in Oregon. The certification program required new stoves to achieve a 50% reduction in emissions by 1986, and an approximate 75% reduction by 1988. Later, the EPA adopted nationwide standards for wood stove emissions. In 1991, the sale or installation of uncertified stoves by private parties was banned in Oregon, and uncertified stoves were required to be removed upon sale of a home in a PM_{10} non-attainment area. Few installation permits are now issued in the City of Medford for new wood stoves, and weatherization of the home is required when a new wood stove is installed. Most new fireplaces are equipped with natural gas, with more of a decorative purpose than as a heating source. Some communities, such as the City of Ashland, issue rebates for the removal of wood stoves to expedite the elimination of uncertified stoves, and provide financial incentives to low-income residents.

Wood Stove Replacement Program

The Housing Authority of Jackson County administers programs for lower income households that replace wood stoves used as a sole source of home heating. Most are replaced with natural gas furnaces. The Housing Authority receives federal Community Development Block Grant (CDBG) funds through the City of Medford for such "emergency" repairs. These programs replaced 253 wood stoves in Medford since 1989, and 305 wood stoves countywide.

Liaison Activities

Medford is part of the *Interagency Air Quality Team*, consisting of representatives from Ashland, Central Point, Jackson County, ACCESS, Inc., the Housing Authority of Jackson County, Pacific Power, Avista Natural Gas, and the Oregon DEQ. The Jackson County Environmental Health Division conducts training for air quality staff to reduce duplication of services, and to provide a consistent unified approach to monitoring, surveying, and education. Medford's Air Quality Technicians operate out of the Jackson County office, and participate in joint activities. This cooperation indicates the practicality and cost-effectiveness of a regional approach to air quality issues in the Rogue Valley. Survey activities are conducted throughout the AQMA to obtain information concerning excessive wood smoke emissions. Specific areas have been surveyed

every year since 1985. These surveys indicate a decrease in the number of households using wood as a heating source. The increased use of heat sources such as natural gas and electric heat pumps has contributed to the reduction in homes heated by wood stoves.

Wood Burning Curtailment and Enforcement Activities

The Wood Burning Advisory program is used to permit or prohibit smoke emissions in the *Critical PM_{10} Curtailment Area*. It serves to inform the public of the status of PM_{10} levels in the atmosphere relative to federal standards. The Jackson County Environmental Health Division staff establishes the daily advisory by 6:00 a.m. each day from November 1 through February 28. The familiar *green, yellow*, or *red* day status indicators are broadcast on most television and radio stations in the region, are published in local newspapers, and are available by phone. Green indicates that PM_{10} levels are low and good air circulation is predicted. Yellow indicates that PM_{10} levels are rising and poor air circulation is predicted, and red indicates that PM_{10} levels are approaching an unhealthy level and stagnant air conditions are predicted.

On *yellow* and *red* days during the wood burning season, generation of smoke is restricted and enforcement monitoring takes place. Technicians are dispatched to observe smoke emissions. Violators are contacted by mail and targeted for special programs to aid in reducing or eliminating their wood smoke emissions. The winter of 97-98 marked the seventh consecutive winter with no *red* days. Like CO, PM_{10} is considered a wintertime issue. The cold, stagnant air characteristic to the season traps pollution in the Rogue Valley, accumulating to unhealthy levels. While the Medford-Ashland AQMA once regularly violated federal standards for PM_{10} and CO due to excessive wood smoke, the standards have not been exceeded for a number of years (See Figure 4.). A key factor, according to air quality experts, is public cooperation in pollution reduction programs.

Outdoor Burning Restrictions

Outdoor burning is not permitted within the City of Medford, and, in Jackson County, is permitted only when the *predicted afternoon ventilation index* is 400 or greater. From November 1 through February 28, all outdoor burning within the Medford-Ashland AQMA is prohibited. Special allowances have been made for agricultural burning to control diseases and pests. These allowances, mostly for orchard prunings, have been renewed annually as alternate disposal methods for pruned material are investigated. Further restrictions on outdoor burning occur during the fire season, resulting in outdoor burn "windows" in the AQMA outside of cities only in the spring and fall. The City of Medford also administers a fall leaf pick-up program throughout the city to reduce the need for fall burning.

Public Education

Educating the public about ways that individuals can help improve and maintain air quality in the Rogue Valley is one of the most effective means of improving air quality. Public education involves a mix of newspaper, radio, and television announcements and advertising, field and phone contacts, brochure distribution, and community and classroom presentations. The goal of these educational programs is to teach residents that continued compliance with air quality improvement programs is necessary, and that air quality continues to improve because of public cooperation.

Congestion Mitigation and Air Quality Improvement Program

The federal Congestion Mitigation and Air Quality Improvement (CMAQ) Program has provided

~~considerable funding to jurisdictions within the Medford-Ashland AQMA for dust and motor vehicle emission reduction programs. More than $4.7 million was apportioned from the CMAQ program between 1992 and 1997. The City of Medford was allocated funds to pave alleys, install curbs, gutters, sidewalks, and bicycle lanes, and enhance street sweeping. Additional funds have extended the Bear Creek Greenway multi-use path, and aided in the construction of a park-n-ride lot and transit transfer station at the South Gateway Shopping Center for the Rogue Valley Transportation District (RVTD) and a compressed natural gas fueling station in Medford.~~

~~Traffic Signal Timing System~~

~~The City of Medford has implemented a computerized traffic signal control system designed to minimize overall delay for motorists. Inefficient traffic movement produces increased CO emissions from idling automobiles. As population and vehicle use increases, traffic control has become more critical in maintaining standards for CO. Main arterial streets are favored by the system, so that high traffic streets move vehicles more efficiently. Traffic studies are used to engineer changes within the system. The system has the capability of having "real time" traffic monitoring and dynamic traffic controls that change in response to demand in the future. One innovation in use in Medford, designed to minimize waiting times at signals, and, thereby, air emissions from idling vehicles, is the Protective/Permissive Left Turn Indicator. This feature allows motorists to make a *protected* left turn at intersections when the left arrow is green, and a *permissive* left turn when the light is green *and* oncoming traffic permits.~~

NATURAL RESOURCES - AIR QUALITY - CONCLUSIONS

1. Medford's location in the Rogue Valley below substantial mountain ranges (the Cascades, the Siskiyous, and the Coast Range) increases the difficulty of maintaining federal air quality standards. Medford's climate is influenced by atmospheric inversion layers in the fall and winter months which trap air emissions in the valley.

2. The City of Medford has little influence on the air pollution emissions caused by travelers and freight shippers traveling through the planning area on state highways such as Interstate 5.

3. ~~The Medford-Ashland Air Quality Maintenance Area (AQMA) is a "non-attainment area" for carbon monoxide (CO) and the Medford Urban Growth Boundary is a "non-attainment area" for particulate matter (PM_{10}).~~Largely due to improvements in modern vehicle emission control systems, carbon monoxide (CO) level progressively improved in the years since the designation of the Medford-Ashland AQMA, and Medford has not violated the federal CO standard since 1991. As a result, Medford was re-designated an "attainment" area for CO in 2002. Similarly, Medford has been in compliance with federal particulate matter (PM_{10}) standards since 1994, and was re-designated an "attainment" area for PM_{10} in 2006. Maintenance plans for the AQMA have been approved by the EPA to help ensure continued compliance with the federal standards for these two pollutants.

4. While Medford's air quality has improved due to proactive Air Quality Maintenance Area (AQMA) programs and increased public awareness, particularly relating to wood smoke, the potential to revert to previous poor air quality conditions exists. The Rogue Valley's topography, its many motor vehicles, and continued population growth have the potential to further degrade Medford's air quality in the future.

5. Pollutants of concern in the Medford-Ashland AQMA are particulate matter ($PM_{2.5}$), ozone, and air toxics (although the DEQ does not presently have any air toxics monitors in SW Oregon). While ozone levels have declined in Medford since 2007, there was a slight uptick measured in the 2013-2015 timeframe. Medford trends close to the $PM_{2.5}$ standards in both daily and annual average levels. ~~The *State Implementation Plan* (SIP) for PM_{10} for the Medford-Ashland Air Quality Maintenance Area (AQMA) is being revised to meet the *National Ambient Air Quality Standards* (NAAQS), including new, stricter standards for particulate matter (PM_{10} and $PM_{2.5}$).~~

NATURAL RESOURCES - AIR QUALITY
GOALS, POLICIES, AND IMPLEMENTATION MEASURES

Goal 3: To enhance the livability of Medford by achieving and maintaining compliance with National Ambient Air Quality Standards (NAAQS).

Policy 3-A: The City of Medford shall continue to provide leadership in developing, adopting, and implementing regional air quality improvement strategies to ~~achieve~~ maintain compliance with

the National Ambient Air Quality Standards (NAAQS).

Implementation 3-A (1): Continue to participate, along with state and local agencies involved in air quality attainment, in the preparation and implementation of the applicable *Air Quality Management Plans* (AQMP's) and *State Implementation Plans* (SIP's) for the Medford-Ashland Air Quality Maintenance Area (AQMA).

Implementation 3-A (2): Continue to participate, along with Jackson County and other affected agencies, in administering air quality public education and smoke reduction programs.

Implementation 3-A (3): Implement strategies from sources such as the *Medford Transportation System Plan,* the *State Implementation Plans* (SIPs) and the *Oregon Transportation Planning Rule* (TPR) that reduce emissions or improve air quality, such as increasing the use of alternative modes of transportation and use of alternative motor vehicle fuels, such as compressed natural gas and electricity, and propose amendments to the *Medford Land Development Code* for consideration by the City Council where necessary to assure compliance with such plans or rules.

See also the policies of the *Medford Transportation System Plan*, and Policy 9 of the "Urbanization Element."

Policy 3-B: The City of Medford shall continue to require a well-connected circulation system and promote other techniques that foster alternative modes of transportation, such as pedestrian-oriented mixed-use development and a linked bicycle transportation system.

See also Goal 1 of the *Southeast Plan* section of the "General Land Use Plan Element."

Implementation 3-B (1): Promote the use of incentives by Medford's larger employers to induce employees to use alternative modes of transportation or work at home in an effort to reduce motor vehicle emissions.

* * *

DISASTERS AND HAZARDS

This section of the "Environmental Element" discusses potential disasters and hazards in Medford, *including natural* and *human-caused*, and the city's emergency management efforts, and presents the conclusions, goals, policies, and implementation strategies pertinent to these factors.

EMERGENCY MANAGEMENT PLANNING

The City of Medford has an *Emergency ~~Management~~ Operations Plan* (E~~M~~OP) to guide efforts in mitigating, preparing for, responding to, and recovering from major emergencies and disasters. The E~~M~~OP is part of a *Comprehensive Emergency Management Program* that coordinates federal,

state, and local governmental agencies in an operating partnership. The responsibility for maintaining the E~~M~~OP is borne by the city's Emergency Management Coordinator though the Emergency Management Planning Team. The Coordinator is responsible for all emergency planning activities, including periodic reviews of the Plan, planning and conducting disaster training exercises, coordinating mitigation efforts, and assisting in acquisition of state and/or federal assistance for these efforts.

All disaster mitigation and preparedness activities are coordinated by the Emergency Management Planning Team, which consists of the City Manager and various department heads, including the Fire Chief, Police Chief, Public Works Director, Building Safety Official, and the Emergency Management Coordinator. The City of Medford's primary Emergency Command Center (ECC) is located in the City Hall Lausmann Annex at 200 South Ivy Street, with a backup ECC ~~in the Jackson County Building, 10 South Oakdale Street~~located at the County Emergency Operations Center at 400 Pech Road. The city responds to disasters within the city, within Medford Rural Fire Protection District #2, and at other city-owned facilities when the response will benefit the City.

Mitigation and preparedness planning include advance preparations to minimize public risk from potential disasters, to reduce the likelihood of a major emergency or disaster, and to reduce the anticipated damage. Mitigation can reduce loss of life and property damage through land use regulations and construction practices. Identifying the types, magnitude, and probability of hazards to which an area is susceptible over a significant length of time (hazard risk analysis) is necessary, as well as assessing the degree of hazard risks that the jurisdiction finds acceptable. The cost of mitigating certain risks may be more than a community can afford. Risk standards should be formally adopted as public policy by the local legislative body through comprehensive planning, land development ordinances, permit review, and fire/building safety codes.

NATURAL DISASTERS AND HAZARDS

Goal 7 of the *Statewide Planning Goals*, "Areas Subject to Natural Disasters and Hazards," requires land use planning in Oregon to consider known areas of natural disasters and hazards. It requires plans to be based on an inventory of such natural hazard areas. Although one of the State of Oregon's main focuses is on flooding, ~~other~~ there are a number of additional natural hazards that have the potential to disrupt life and commerce in Medford, including earthquakes and wild-land urban interface fires, ~~,~~volcanic eruptions, severe weather, emerging infectious diseases, air quality, and landslides. (Air quality and l~~L~~andslides ~~and soil related problems~~ were discussed previously under "Air Quality" and "Soils.")

The natural hazards identified and summarized in this section are thoroughly inventoried and analyzed in the *2017 Medford Natural Hazards Mitigation Plan* which was adopted by City Council in September 2017, and is hereby incorporated by reference into the Comprehensive Plan. The City adopted its first *Natural Hazards Mitigation Plan* in 2004 and updated it in 2010. The *2017 Medford Natural Hazards Mitigation Plan* has been reviewed and approved by the Oregon Office of Emergency Management (OEM) and the Federal Emergency Management Agency (FEMA). As a result of those approvals the City is eligible to receive pre- and post-disaster mitigation funds from FEMA.

FLOODING

Over the past 50 years, major floods occurred in the Rogue Valley in 1955, 1962, 1964, 1974, and, more recently, in 1997. These floods threatened public health, safety, and welfare by destroying or isolating structures, disrupting transportation systems, polluting water supplies, and destroying basic public facilities, such as sewerage and electric services. Recent incidences of record rainfall and flooding across Oregon have renewed concerns about the potential for flooding in the Medford UGB, and have rekindled interest in preparing for potential floods. To minimize the hazards posed by floods, the City of Medford should continue to implement the recommendations of the *Comprehensive Medford Area Drainage Master Plan* and the *2017 Medford Natural Hazards Mitigation Plan* through revisions to Medford's *Comprehensive Plan* and *Land Development Code,* in addition to implementing state and federal regulations.

Floodplain Mapping

The sale of federal flood insurance in Medford, through the *National Flood Insurance Act of 1968*, was authorized in 1974. The Federal Emergency Management Agency (FEMA) developed a 100-year or *base flood* for use in mapping floodplains as part of the national flood insurance program. Federal law requires the first floor of a new building to be *at* or *above* the 100-year flood level, while Oregon law is more restrictive, requiring the first floor of a new building to be one foot *above* the line. Stricter development restrictions can be imposed by cities and counties, such as zoning restrictions that limit vulnerable land uses in floodplains, and programs developed to inform property owners of the hazards posed by waterways. Specialists in natural hazards planning note that the 100-year designation is only a tool, and does not guarantee that flooding will occur only within this floodplain designation.

Floodplains can be delineated according to topography, vegetation, soils, or the extent of past floods.[7] When defined according to geomorphic features, the floodplain includes the low-lying land along the stream, the outer limits of which may be marked by steep slopes or valley walls. See **Figure 12** for a graphic representation of a floodplain as defined by FEMA. The *regulatory floodway* is the lowest part of the floodplain where most frequent flood flows occur. This area is not eligible for federal flood insurance. The *floodway fringe* is the area that would be lightly inundated by a 100-year flood, and is eligible for flood insurance if flood proofing has been undertaken. Of all the features of a river valley, the floodplain is the most important from a planning standpoint for three reasons. First, excluding the stream channel itself, the floodplain is the lowest part of the stream valley, and consequently, prone to flooding. Second, floodplain soils are often poorly drained because of the high water tables and saturation by flood waters. Third, floodplains are formed by incremental erosion and deposition that accompany the meandering of streams through valleys.

As a prerequisite to obtaining federal flood insurance, the City of Medford was required to identify flood hazard areas, and to control development in floodplains. In Medford, flood hazard areas are located along Bear Creek and most other waterways. Federal Insurance Rate Maps (floodplain

[7] *Landscape Planning: Environmental Applications,* William M. Marsh, 1991.

maps) are available in the Medford ~~Building Safety~~ Planning Department. In 1974, the City Council established a review process to assure that proper construction methods and utility locations were undertaken in flood hazard areas. For example, new and replacement water and sanitary sewer systems are required to be designed to minimize or eliminate the infiltration of flood waters into the systems, and discharge from the systems into flood waters.

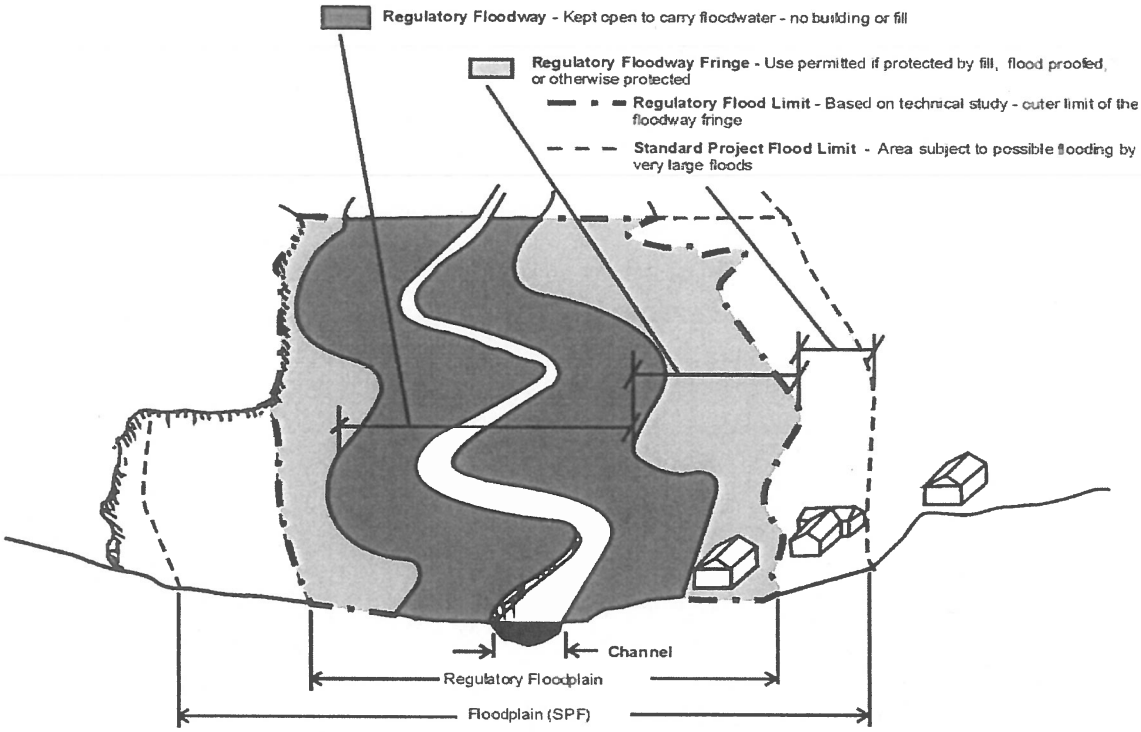


Figure 12
U.S. National Flood Insurance Program
100-Year Floodplain

Source: *Landscape Planning: Environmental Applications*, 2nd Edition, William M. Marsh, 1991.

While floodplain maps are helpful, Oregon's short recorded weather history and changing climatic conditions make flood estimating unpredictable. Additionally, the state's expanding population and fast rate of development continue to alter the landscape and natural waterways.[8] As a result, many floodplain maps are outdated. A FEMA expert noted in a 1997 *Oregonian* article, that many watersheds in Oregon have changed since floodplains were mapped, and, that *"(n)ew houses and pavement in the place of fields and woods mean quicker runoff into streams. 'We're seeing a lot more urban flooding than was occurring in past decades.'"*

Medford is similar to many Northwest communities located in valleys prone to flooding that were formerly used for agriculture. As the FEMA expert noted, *"Many streams in rural areas weren't seen as priorities when maps were being drawn and weren't included in the studies. Now*

[8]Ibid.

communities have sprouted on former pastures. In addition to areas that need to be restudied, there are many areas that we have not yet studied at all. So just because you don't live in an area that we say is subject to a 100-year flood, it may mean that we haven't gotten around to studying it."[9] The State of Oregon has requested that FEMA place a high priority on updating Oregon's floodplain maps.

Flood Damage Reduction

The City of Medford is one of the few Oregon communities to take part in the Community Rating System (CRS) program, which is intended to aid in reducing flood losses, to facilitate accurate insurance ratings, and to promote awareness of flood insurance. The program provides flood insurance premium discounts as an incentive for cities to develop extra flood protection measures beyond what the national program requires. Communities can qualify for up to a 45% discount. ~~In 1999, Medford qualified for a 5% discount in premiums.~~ The discount is based on a point system. A high number of additional points can be earned through such activities as collecting and maintain flood data, protecting open space, stormwater management, higher regulatory requirements, and acquisition/relocation or retrofitting of flood prone properties or structures. As of 2017 Medford has a Class 6 rating under the CRS program. This rating provides discounts of 20% on flood insurance to properties within the FEMA-identified Special Flood Hazard Area (SFHA), and 10% outside the SFHA.

The *Medford Municipal Code* section entitled "Flood Damage Prevention Regulations and Flood Insurance Maps" states that to accomplish its purposes it includes methods and provisions to: ~~*It is the purpose of these sections to minimize public and private losses due to flood conditions in specific areas by methods and provisions designed for:*~~

(1) ~~*(1)*~~ *Require development that is vulnerable to floods, including structures and facilities necessary for the general health, safety and welfare of citizens, to be protected against flood damage at the time of initial construction;*

(2) Restrict or prohibit uses which are dangerous to health, safety and property due to water or erosion hazards, or which increase flood heights, velocities, or erosion;
Control filling, grading, dredging and other development which may increase flood damage or erosion; ~~*Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;*~~

(3) Prevent or regulate the construction of flood barriers that will unnaturally divert flood waters or that may increase flood hazards to other lands;

(4) Preserve and restore natural floodplains, stream channels, and natural protective barriers which carry and store floodwaters, and;

(5) Coordinate with and supplement provisions of State of Oregon Specialty Codes enforced by the State of Oregon Building Codes Division.

~~*(1)*~~

~~(2) Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;~~

[9] Ibid.

~~(3) Controlling the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;~~
~~(4) Controlling filling, grading, dredging, and other development which may increase flood damage; and~~
~~(5) Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or may increase flood hazards in other areas.~~

While Medford's infrastructure handled the most recent (1997) flood well, there was damage in some areas along Bear Creek and Larson Creek, emphasizing the continuing need to update and refine the city's floodplain regulations. Development and redevelopment should be highly scrutinized when located in floodplains. The ~~proposed~~ riparian corridor and wetland building setback requirement will aid in reducing future flood damages to structures and improvements. Existing and proposed requirements for on-site detention of stormwater will aid in regulating storm water flows during peak events.

Some of the recommendations of the Oregon Office of Emergency Management *Interagency Mitigation Team Report* made in response to the 1997 floods in Oregon include the following:

- Strengthen the public facility planning review process to encourage consideration of stormwater system limitations and coordinate plans with a regional perspective, including upstream and downstream communities. Systems often become inadequate because of growth beyond anticipated levels (i.e., increased amount of impervious surface increases runoff). This growth often occurs without subsequent increases to stormwater capacity or recognition of system limitations.
- Water storage through various means, such as creation of wetlands, retention areas, detention basins, and dams can assist in flood control. Encourage flood control projects and development of local flood mitigation plans. These plans should incorporate regional concerns and should consider the watershed as a whole. Encourage the establishment of drainage management plans.
- Where appropriate, allow rivers to reclaim floodplain areas, allowing waterways room to naturally meander and expand. This can be accomplished using conservation easements, land acquisition, riparian trust, and creating wetlands and retention/detention areas, especially in headwater areas.

EARTHQUAKES

While historically, California has been perceived as the most earthquake-prone state in the west, awareness of seismic risk in Oregon has increased significantly since the 1980s, and ~~recently~~ seismologists and geo-scientists have recognized that ~~Oregon~~the state, as well as the entire Pacific Northwest, may be subject to earthquakes of substantial magnitude. Oregon had not experienced a substantial earthquake for almost a century until 1993, when the state suffered three significant quakes: the first near Salem, in Scotts Mills (magnitude 5.6 on the Richter scale), and two earthquakes later in Klamath Falls (magnitudes 5.9 and 6.0) felt in Medford. Researchers in geo-science have also become more aware of the potential for moderate earthquakes in Oregon, and, during the last decade, have noted the likelihood of an earthquake of great magnitude striking

offshore.

Four types of ~~E~~earthquakes ~~that occur in Oregon~~affect Medford and the surrounding region: (a) shallow ~~are typically~~ crustal events, (b) deep intra-plate events, (c) the offshore Cascadia Subduction Zone (CSZ) Fault, and (d) earthquakes associated with renewed volcanic activity.~~or great subduction earthquakes.~~ Medford's risk from earthquakes is related to its location between two active fault areas as well as its regional importance as a transportation, freight distribution, communications, and service hub. To the east is the fault zone in the Klamath Falls area, and to the west is the CSZ along the coast, which is the chief earthquake hazard for Southwest Oregon. The region is particularly vulnerable due to the large area susceptible to earthquake-induced landslide, liquefaction, and ground shaking.

~~*Crustal* earthquakes are most common, and occur along relatively shallow faults, normally within 10 miles of the earth's surface. *Intraplate* earthquakes occur at greater depths, approximately 20 to 40 miles beneath the surface. *Great subduction* earthquakes occur along an offshore fault that parallels the Oregon and Washington coasts.[10]~~

The 1993 Salem and Klamath Falls earthquakes were crustal earthquakes, which occur along short, shallow faults that are commonly visible at the earth's surface. Historically, these earthquakes have ~~rarely exceeded magnitude 6.0~~been in the Richter scale 3.0 to 5.0 range, but the historic record is too short to provide a true representation of the probable threats of crustal quakes. ~~Many geo-scientists maintain that, while rare, faults exist in Oregon that could produce earthquakes as large as magnitude 6.5 to 7.0.[11]~~ Crustal earthquakes are relatively common in the Portland area and the northern Willamette Valley, off the southern coast of Oregon, in northeastern Oregon, and in scattered areas throughout southeastern Oregon. In areas east of the Cascades, the majority of the earthquakes originate in crustal faults.

Intraplate earthquakes occur within the remains of the ocean floor that have subducted beneath North America. ~~It is believed that this type of earthquake could occur anywhere beneath the Coast Range or the western Willamette Valley with a magnitude as large as 7.0 to 7.5.[12]~~ Ground shaking from such earthquakes would be very strong near the epicenter and strong ground shaking would be felt throughout Medford. ~~In 1949, and later in 1965, intra plate earthquakes severely rocked Washington's Puget Sound region.~~

Great subduction earthquakes occur worldwide in subduction zones, where continent-sized pieces of the earth's crust are shoved deep into the earth, and are consistently the most powerful type of earthquake recorded, often registering magnitude 8.0 or 9.0. The Cascadia Subduction Zone (CSZ), a ~~750~~620- mile fault located off the West Coast, from British Columbia to Northern California, has not experienced any large earthquakes during the short 200-year recorded history of earthquakes. ~~However, a variety of studies over the past decade indicate that these earthquakes~~

~~[10] *Earthquakes Hazard Maps for Oregon, 1996,* Oregon Department of Geology and Mineral Industries, Donald Hull, State Geologist and I. P. Madin and M.A. Mabey.~~

~~[11] Ibid.~~

~~[12] Ibid.~~

~~occurred repeatedly in the past, every 350 to 500 years.[13] According to available evidence, the last major subduction zone earthquake occurred off the Oregon coast approximately 300 years ago. According to seismologists, should the entire subduction zone rupture, a magnitude 9.0 earthquake would result, similar to a 1960 Chilean subduction zone earthquake that resulted in nearly 5,000 deaths~~According to 2015 data from Oregon Department of Land Conservation and Development (DLCD), there were 18 magnitude 8.8-9.1 megathrust earthquakes in the last 10,000 years that affected the entire subduction zone. The return period for the largest earthquakes is 530 years, and the probability of the next such event occurring in the next 50 years ranges from 7 to 12%. An additional 10 to 20 smaller, magnitude 8.3-8.5 earthquakes affected only the southern half of Oregon and northern California. The average return period for these is about 240 years, and the probability of a small or large subduction earthquake occurring in the next 50 years is 37 to 43%. ~~. **Figure 13** indicates earthquakes 5.0 or greater on the Richter Scale felt during Oregon's brief recorded history.~~

~~Western Oregon is the most likely region of the state to be severely affected by substantial earthquakes in the future, particularly near the southern coastal town of Brookings. State geologists maintain that *"Brookings and the entire coast are the most likely to have peak ground acceleration because of the subduction zone."*[14] The Cascadia Subduction Zone houses the oceanic Juan de Fuca Plate, which plunges under the continental North American Plate approximately 60 to 150 miles offshore.[15] The North American and Juan de Fuca plates are in constant motion, and, if the plates lock up as they move past each other, the stored energy released could result in an earthquake of magnitude 8.0 or 9.0.[16]~~

Because the Cascadia Subduction Zone could produce a very large earthquake affecting nearly all of western Oregon, land use planning and development must incorporate principles of earthquake preparedness and up-to-date seismic construction standards. A subduction earthquake would significantly damage residences, educational buildings, and government, industrial and commercial buildings in Jackson County. In Medford, the unreinforced masonry buildings in the downtown core and other areas would be especially vulnerable.

~~Medford was rated by the Oregon Department of Geology and Mineral Industries at approximately 26-28 on a scale of potential damage from earthquakes, with zero being the lowest possible score and 115 being the highest. Moving westward the potential for damage increases dramatically. Grants Pass, only 29 miles northwest of Medford, received a rating of 36, and Brookings, the highest at 85.~~

~~[13]Ibid.~~

~~[14]Ibid.~~

~~[15]"Experts Deliver Earthshaking News", *The Oregonian*, Richard Hill, April 23, 1996.~~

~~[16]"Quakes: Mapping the Hazards", *The Oregonian*, Richard L. Hill, November 14, 1996.~~

Figure 13
Earthquakes Centered or Felt in Oregon
Magnitude 5.0 or Greater on the Richter Scale

Sep. 20, 1993	An earthquake of magnitude 6.0 centered about 10 miles northwest of Klamath Falls caused light damage to buildings.
Sep. 20, 1993	An earthquake of magnitude 5.9 centered 15 miles northwest of Klamath Falls closed some highways and bridges.
Mar. 25, 1993	An earthquake of magnitude 5.6 centered near Woodburn rocked most of the state, and caused damage to bridges and the State Capitol Building in Salem.
Feb. 13, 1981	An earthquake of magnitude 5.5 centered near Mount St. Helens shook the Portland area.
May 30, 1968	An earthquake of magnitude 5.1 hit the Adel-Warner Lakes area near Lakeview in south central Oregon.
Apr. 29, 1965	An earthquake of magnitude 6.5 centered between Seattle and Tacoma, Washington was felt in the Portland area.
Oct. 1, 1964	An earthquake of magnitude 5.3 hit Portland's Sauvie Island in the Columbia River.
Nov. 5, 1962	An earthquake of magnitude 5.5 centered in Vancouver, Washington, was the largest quake then recorded in the immediate vicinity of Portland.
Dec. 16, 1953	An earthquake of magnitude 5.6 hit the Portland area.
Apr. 13, 1949	An earthquake of magnitude 7.1 centered between Olympia and Tacoma, Washington caused damage in Portland.
Jul. 16, 1936	An earthquake of magnitude 6.1 was centered in the Milton-Freewater area.
May 13, 1916	An earthquake of an estimated magnitude of 5.7 was centered in Richland, Washington.
Mar. 7, 1893	An earthquake of an estimated magnitude of 5.7 was centered in Umatilla.
Feb. 4, 1892	An earthquake of an estimated magnitude of 5.6 hit the Portland area.
Oct. 12, 1897	An earthquake of an estimated magnitude of 6.7 shook the Gresham area.
Nov. 23, 1873	An earthquake of an estimated magnitude of 6.3 was centered in the Crescent City, California area.

Source: DOGAMI

Since 1993, when the Seismic Zone rating of Oregon was revised from Zone 2 to Zone 3, new buildings in Oregon have been required to meet more stringent seismic construction standards; however, local jurisdictions can designate seismic standards for existing structures. State and local government buildings and facilities are required to be inspected and meet higher standards. In 1995, the Oregon Legislature created a task force to examine and develop recommendations concerning the threat of earthquakes to structures. The task force recommendations address unreinforced masonry buildings, where the greatest amount of upgrading is required to meet current standards. Downtown Medford, like the downtowns of many Oregon cities, is especially prone to earthquake damage, due to the large number of these structures.

WILDLAND-URBAN INTERFACE -FIRES

Nationally, more and more homes are being constructed in or adjacent to wildland areas. A desire for a rural or suburban living environment on the fringe of urban areas has increased the risks in what is termed the ~~urban/~~wildland-urban interface. The interface is the area where residential development comes into contact with areas of natural vegetation that can contribute to rapid fire spread and additional fuel loading. Although Medford has few of these types of areas, the hazard will increase as the City grows farther into the eastern foothills. Some of the fire protection problems that can occur in ~~urban/~~wildland-urban interface areas include use of combustible exterior construction materials, inadequate access for fire apparatus, lack of fire protection water, lack of residential sprinkler systems, inadequate fuel breaks around structures, driveways that are not clearly addressed, and lack of knowledge by property owners regarding how to act when a fire threatens.

Areas within the Medford UGB that could be susceptible to wildland fires include the far eastern section of the community on the southern and western slopes of Roxy Ann Butte, and generally in the area east of North Phoenix Road wherever steep slopes and thick natural vegetation exist. The City of Medford, Jackson County, and the Oregon Department of Forestry respond in these areas according to the location of the fire and mutual aid agreements.

Wildland fires often require special equipment, such as four-wheel drive vehicles, to reach inaccessible areas that are typical of wildland areas. The City has specialized equipment designed specifically for wildland terrain, including four and six-wheel drive vehicles; and employs a combination of standard firefighting equipment with forces of fire fighters on the ground to fight wildland fires effectively. Jackson County has identified areas outside UGB[2]s where the interface exists, prepared a program to inform the public of the special conditions that may threaten public safety and property, and adopted interface fire protection principles into enforceable codes.

VOLCANIC ERUPTIONS

In Oregon, awareness of the potential for volcanic eruptions greatly increased with the 1980 eruption of Mount St. Helens in Washington State which killed 57 people. The eastern boundary of Jackson County coincides with the crest of the Cascade Mountains, a volcanic range that has a number of still active volcanoes that stretch from Northern California to British Columbia. While questions remain regarding when and to what extent volcanic activity in the Cascades will occur, the *2015 Oregon Natural Hazards Mitigation Plan* states that Jackson County is at some risk from volcano-associated hazards, however remote. According to the Oregon Department of Geology and Mineral Industries, Crater Lake and Mount Shasta are the two biggest volcanic hazards known for Medford, both of which are composite, active volcanoes relatively near the city; however, Mt. McLoughlin, Three Sisters, Newberry Volcano, and Mt. Lassen could also impact Medford if they were to erupt.

While there are several potential hazards associated with volcanic eruptions, the one deemed most likely to affect Medford is that of ashfall. Ashfall occurs when explosive eruptions blast rock fragments into the air. Such blasts may include solid and molten rock fragments called tephra. The largest rock fragments generally fall within two miles of the eruption event, and smaller ash fragments less than 0.1 inches typically rise into the area forming a huge eruption

column. In very large eruptions, ashfalls may total many feet in depth near the vent and extend for hundreds or even thousands of miles downwind. Modest production of ashfall would pose chiefly non-life-threatening hazards to nearby communities, including Medford.

Hazards associated with ashfall include:

- Reduced sunlight and visibility;
- Respiratory problems for at-risk populations such as the elderly, young children, and persons with pre-existing respiratory conditions;
- Impacts on public water supplies drawn from surface waters;
- Electric power outages from ash-induced short circuits in distribution lines and substations;
- Disruptions of air traffic;
- Clogging of filters, abrasion and corrosion, and other damages to heating, ventilation, and air-conditioning systems;
- Collapse of roof and structures due to the weight of wet ash;
- Clean-up and ash removal from the transportation network.

SEVERE WEATHER

Severe weather is the most frequently occurring natural hazard in Medford. Severe weather includes winter storm events such as heavy rain, wind, snow and ice; other severe weather events are thunderstorms, hail, lightning strikes, tornadoes, and drought/heat waves. In Medford, high winds and periods of extreme cold and heat are common. Less common incidents include snow and ice storms generated in the Siskiyou Mountains which create hazardous driving conditions and may lead to power outages. Typically, storms are short-term in nature, lasting one to two days, and can be managed with local emergency response resources.

Most common from October through April, snowstorms and windstorms can disrupt the region's utilities, telecommunications and roadway systems. Damage from wind storms is typically related to the hazard of falling trees and limbs, and the consequent downing of utility infrastructure and power outages. Fallen limbs and uprooted trees can also block roadways, disrupting the transportation network. Late summer and early fall wind storms, occurring during the dry season, often increase wildfire risks, and heavy rains followed by strong winds often result in the falling of shallow-rooted trees. Jackson County also has extended hot and dry weather conditions during the summer and early fall months, and sequential years of below normal rainfall over winter months can result in severe drought conditions as seen in 1939, 1976-1981, 1987-1994, 2001, and 2013-2015.

It is important to note that severe weather events are often the result of events that affect large geographic areas in Oregon and the Pacific Northwest. As such, it is difficult to make regional severe weather probability assessments. While severe weather events have been more frequent in winter months, climate change is resulting in probabilities becoming a moving target. While history provides insight on past severe weather patterns, in reality, all persons and critical facilities are at risk from severe weather impacts, especially those that result in power outages.

EMERGING INFECTIOUS DISEASES

Medford is home to the largest, most concentrated population in Region 4 of Oregon's NHMP Natural Hazard Regions. As a regional employment, recreational, residential, retail and health care hub, Medford draws many non-residents on a daily basis into the area, multiplying the opportunities for further disease exposure and transmission among both visitors and residents. Recognizing this expanse of exposure is important; it is possible that a disease related issue could impact a large portion of the region's population.

Disease is a sickness, illness, or loss of health, and terms such as disease outbreaks, epidemics, and pandemics are often used to describe situations where multiple cases of infection are identified and the amount of disease in a community rises above the expected level. The following definitions are from The Centers for Disease Control and Prevention (CDC):

- **Epidemic** refers to an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area.
- **Outbreak** carries the same definition of epidemic, but is often used for a more limited geographic area.
- **Cluster** refers to an aggregation of cases grouped in place and time that are suspected to be greater than the number expected, even though the expected number may not be known.
- **Pandemic** refers, to an epidemic that has spread over several countries or continents, usually affecting a large number of people.

Diseases are identified, researched, and managed as much as possible by public health agencies. In Medford, the agency that provides surveillance, investigates reportable disease, infections or conditions, and carries out appropriate control measures is Jackson County Public Health. Oregon Health Authority may provide assistance in these investigations.

Emerging infectious diseases have been identified in the top five hazard vulnerabilities within our healthcare systems, and overall it is probable a person will have one or more during their lifetime. The diseases identified in the *2017 Medford Natural Hazards Mitigation Plan* are not the only diseases that exist or could potentially impact Medford, and the vulnerabilities and impacts to people, property, and the environment vary widely. People with access and functional needs (e.g. the elderly, the very young and medically fragile persons) are more susceptible to impacts, as are critical facilities such as hospitals, airports, and fire and police forces. Furthermore, water, air, and land can be contaminated by emerging infectious diseases. When this happens in localized or broad scale situations, many people as well as plants and animals can suffer greatly. While the potential impacts are difficult to quantify in dollar amounts, it is clear that widespread illness, disability, and death impacts the economy.

* * *

DISASTERS AND HAZARDS CONCLUSIONS

1. The Medford Urban Growth Boundary contains streams and waterways that have a history of flooding occasionally.

2. The *National Flood Insurance Program* is available in communities that implement comprehensive floodplain regulations to reduce flood damage. As a participant in this

program, Medford adopted regulatory provisions to minimize flood losses through development controls such as building codes and development regulations that place restrictions on new construction or improvements to flood-prone structures.

3. According to seismologists, the likelihood of an earthquake of serious magnitude in the Northwest is high. Medford is at risk for potential earthquake damage because many older buildings have not been built or upgraded to current earthquake standards. Medford's emergency management planning recognizes this possibility.

4. The threat of wildland-urban interface fires within the Medford Urban Growth Boundary ~~is relatively slight, but~~ will increase as development abuts or increases in areas prone to wildland fire dangers, such as steep slopes, dense natural vegetation, etc.

5. The threat of loss of life and/or property damage in areas that may be impacted by wildland-urban interface fires can be reduced through the use of ~~less combustible~~ ignition-resistant construction methods/materials, adequate fire response apparatus, availability of fire protection water, adequate fuel breaks surrounding structures, appropriate road widths to accommodate fire fighting vehicles, and response and evacuation plans that are understood by the residents of these areas.

6. The eastern boundary of Jackson County coincides with the crest of the Cascade Mountains, a volcanic range that has a number of still active volcanoes. According to the Oregon Department of Geology and Mineral Industries, Crater Lake and Mount Shasta are the two biggest volcanic hazards known for Medford, both of which are composite, active volcanoes relatively near the city.

7. While there are several potential hazards associated with volcanic eruptions, the one deemed most likely to affect Medford is that of ashfall. Likely hazards associated with ashfall include respiratory problems, impacts on transportation networks, power outages, and damage to building air filtration systems.

8. Severe weather is the most frequently occurring natural hazard in Medford. Typically, storms are short-term in nature, lasting one to two days, and can be managed with local emergency response resources.

9. Snowstorms and windstorms can disrupt the region's utilities, telecommunications and roadway systems. Damage from wind storms is typically related to the hazard of falling trees and limbs, and the consequent downing of utility infrastructure and power outages. Late summer and early fall wind storms, occurring during the dry season, often increase wildfire risks.

10. Climate change is resulting in severe weather event probabilities becoming a moving target. While history provides insight on past patterns, in reality, all persons and critical facilities are at risk from severe weather impacts, especially those that result in power outages.

11. Emerging infectious diseases have been identified in the top five hazard vulnerabilities within our healthcare systems, and overall it is probable a person will have one or more

during their lifetime. People with access and functional needs (e.g. the elderly, the very young and medically fragile persons) are more susceptible to impacts, as are critical facilities such as hospitals, airports, and fire and police forces. Furthermore, water, air, and land can be contaminated by emerging infectious diseases.

12. As a regional employment, recreational, residential, retail and health care hub, Medford draws many non-residents on a daily basis into the area, multiplying the opportunities for further disease exposure and transmission among both visitors and residents.

13. The most common noise sources in Medford are transportation-related, and include automobiles, trucks, motorcycles, railroads, and aircraft. Motor vehicle noise is a pressing concern, because it often occurs in areas sensitive to noise exposure, such as residential areas, and continues to increase with urban growth and increasing numbers of motor vehicles.

~~7.~~

14~~7~~. The City of Medford has adopted noise reduction strategies in the *Land Development Code* to mitigate the harmful effects of noise, including a noise ordinance, which regulates the level of commercial and industrial noise based on the proximity to noise-sensitive properties; bufferyards, which use setbacks, fencing/walls/berms, and vegetation to mitigate adverse impacts between adjacent land use types, and agricultural buffering, in which Medford and Jackson County jointly implement policies to minimize the impacts of urban development on abutting agricultural uses.

~~8~~15. Airports can adversely impact residential and other sensitive development through noise and accident hazards. Future airport expansion plans could create land use conflicts as flights increase.

DISASTERS AND HAZARDS
GOALS, POLICIES, AND IMPLEMENTATION MEASURES

Goal 12: To protect the citizens of Medford from the potential damage caused by hazards such as flooding, earthquakes, ~~noise,~~ wildland-urban interface fires, volcanic eruptions, severe weather, emerging infectious diseases, ~~and~~ noise, and airport hazards.

Policy 12-A: The City of Medford shall assure that hazard mitigation standards are formally adopted as public policy through comprehensive planning, land development ordinances, permit review, and fire/building safety codes.

Implementation 12-A (1): Continue to conduct hazard risk analysis, including identifying the types, magnitude, and probability of hazards which the Medford Urban Growth Boundary is susceptible to over the long term, including assessing the degree of risk that the citizens find acceptable.

Policy 12-B: The City of Medford shall ensure that the potential impacts of flooding are adequately analyzed when considering development projects.

Implementation 12-B (1): Maintain and, when necessary, update the city's requirements for development in floodplains, consistent with federal and state regulations, and the *Uniform Building Code* (UBC).

Implementation 12-B (2): Adhere to the policies outlined in the *Medford Comprehensive Drainage Master Plan* to minimize flood losses through development controls.

Implementation 12-B (3): Encourage the re-mapping of flood-prone areas in Medford using data from the most recent flood(s) of record.

Implementation 12-B (4): Consider flood hazards when installing public improvements such as parks and paths in flood-prone areas. Design these amenities to withstand a certain flood level.

See also the Policies of the *Storm Water Drainage* section of the "Public Facilities Element."

Policy 12-C: The City of Medford shall continue to utilize building and development standards to mitigate the potentially damaging effects of earthquakes. New construction is required to meet the standards of seismic zone 3 of the *Uniform Building Code* (UBC).

Policy 12-D: The City of Medford shall strive to upgrade all city-owned buildings and facilities to meet earthquake standards.

Policy 12-E: The City of Medford shall continue to update and enforce noise attenuation strategies.

Implementation 12-E (1): Periodically review the city's noise ordinances for adequacy.

Policy 12-F: The City of Medford shall strive to minimize the loss of life and property resulting from wildland-urban interface fires within the Urban Growth Boundary.

Implementation 12-F (1): Undertake efforts to educate the public in wildland-urban interface fire safety.

Implementation 12-F (2): Develop and adopt fire safety performance standards for development in those areas identified as being at risk of wildland-urban interface fires.

Policy 12-G: The City of Medford shall designate future residential areas in coordination with the *Rogue Valley International-Medford Airport Master Plan* to minimize conflicts with flight patterns, hazard areas, and airport expansion areas.

* * *

CONCLUSIONS, GOALS, POLICIES, AND IMPLEMENTATION STRATEGIES

City of Medford
411 West Eighth Street
Medford, Oregon 97501
~~plnmed@ci.medford.or.us~~planning@cityofmedford.org

~~Last~~ Revised by
MEDFORD CITY COUNCIL
~~January 7~~XXXXXXXX, 201~~6~~8
Ordinance No. 201~~6~~8-~~08~~

* * *

NATURAL RESOURCES—AIR QUALITY—CONCLUSIONS

1. Medford's location in the Rogue Valley below substantial mountain ranges (the Cascades, the Siskiyous, and the Coast Range) increases the difficulty of maintaining federal air quality standards. Medford's climate is influenced by atmospheric inversion layers in the fall and winter months which trap air emissions in the valley.

2. The City of Medford has little influence on the air pollution emissions caused by travelers and freight shippers traveling through the planning area on state highways such as Interstate 5.

3. Largely due to improvements in modern vehicle emission control systems, carbon monoxide (CO) level progressively improved in the years since the designation of the Medford-Ashland AQMA, and Medford has not violated the federal CO standard since 1991. As a result, Medford was re-designated an "attainment" area for CO in 2002. Similarly, Medford has been in compliance with federal particulate matter (PM_{10}) standards since 1994, and was re-designated an "attainment" area for PM_{10} in 2006. Maintenance plans for the AQMA have been approved by the EPA to help ensure continued compliance with the federal standards for these two pollutants. ~~The Medford-Ashland Air Quality Maintenance Area (AQMA) is a "non-attainment area" for carbon monoxide (CO) and the Medford Urban Growth Boundary is a "non-attainment area" for particulate matter (PM_{10}).~~

4. While Medford's air quality has improved due to proactive Air Quality Maintenance Area (AQMA) programs and increased public awareness, particularly relating to wood smoke, the potential to revert to previous poor air quality conditions exists. The Rogue Valley's topography, its many motor vehicles, and continued population growth have the potential to further degrade Medford's air quality in the future.

5. Pollutants of concern in the Medford-Ashland AQMA are particulate matter ($PM_{2.5}$), ozone, and air toxics (although the DEQ does not presently have any air toxics monitors in SW Oregon). While ozone levels have declined in Medford since 2007, there was a slight uptick measured in the 2013-2015 timeframe. Medford trends close to the $PM_{2.5}$ standards in both daily and annual average levels. ~~The *State Implementation Plan* (SIP) for PM_{10} for the Medford-Ashland Air Quality Maintenance Area (AQMA) is being revised to meet the *National Ambient Air Quality Standards* (NAAQS), including new, stricter standards for particulate matter (PM_{10} and $PM_{2.5}$).~~

NATURAL RESOURCES—AIR QUALITY—GOALS, POLICIES, AND IMPLEMENTATION MEASURES

Goal 3: To enhance the livability of Medford by achieving and maintaining compliance with National Ambient Air Quality Standards (NAAQS).

Policy 3-A: The City of Medford shall continue to provide leadership in developing, adopting, and implementing regional air quality improvement strategies to ~~achieve~~ maintain compliance with the National Ambient Air Quality Standards (NAAQS).

Implementation 3-A(1): Continue to participate, along with state and local agencies involved in air quality attainment, in the preparation and implementation of the applicable Air Quality Management Plans (AQMP's) and State Implementation Plans (SIP's) for the Medford-Ashland Air Quality Maintenance Area (AQMA).

Implementation 3-A(2): Continue to participate, along with Jackson County and other affected agencies, in administering air quality public education and smoke reduction programs.

Implementation 3-A(3): Implement strategies from sources such as the *Medford Transportation System Plan*, the State Implementation Plans (SIPs) and the Oregon Transportation Planning Rule (TPR) that reduce emissions or improve air quality, such as increasing the use of alternative modes of transportation and use of alternative motor vehicle fuels, such as compressed natural gas and electricity, and propose amendments to the *Medford Land Development Code* for consideration by the City Council where necessary to assure compliance with such plans or rules.

See also the policies of the Medford Transportation System Plan, Policy 9 of the "Urbanization Element."

Policy 3-B: The City of Medford shall continue to require a well-connected circulation system and promote other techniques that foster alternative modes of transportation, such as pedestrian oriented mixed-use development and a linked bicycle transportation system.

See also Goal 1 of the Southeast Plan section of the "General Land Use Plan Element."

Implementation 3-B(1): Promote the use of incentives by Medford's larger employers to induce employees to use alternative modes of transportation or work at home in an effort to reduce motor vehicle emissions.

* * *

DISASTERS AND HAZARDS—CONCLUSIONS

1. The Medford Urban Growth Boundary contains streams and waterways that have a history of flooding occasionally.

2. The *National Flood Insurance Program* is available in communities that implement comprehensive floodplain regulations to reduce flood damage. As a participant in this program, Medford adopted regulatory provisions to minimize flood losses through development controls such as building codes and development regulations that place restrictions on new construction or improvements to flood-prone structures.

3. According to seismologists, the likelihood of an earthquake of serious magnitude in the Northwest is high. Medford is at risk for potential earthquake damage because many older buildings have not been built or upgraded to current earthquake standards. Medford's emergency management planning recognizes this possibility.

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DISASTERS AND HAZARDS—GOALS, POLICIES, AND IMPLEMENTATION MEASURES

Goal 12: To protect the citizens of Medford from the potential damage caused by hazards such as flooding, earthquakes, ~~noise, wild~~land-urban interface fires, volcanic eruptions, severe weather, emerging infectious diseases, noise, and airport hazards.

Policy 12-A: The City of Medford shall assure that hazard mitigation standards are formally adopted as public policy through comprehensive planning, land development ordinances, permit review, and fire/building safety codes.

> **Implementation 12-A(1):** Continue to conduct hazard risk analysis, including identifying the types, magnitude, and probability of hazards which the Medford Urban Growth Boundary is susceptible to over the long term, including assessing the degree of risk that the citizens find acceptable.

Policy 12-B: The City of Medford shall ensure that the potential impacts of flooding are adequately analyzed when considering development projects.

> **Implementation 12-B(1):** Maintain and, when necessary, update the City's requirements for development in floodplains, consistent with federal and state regulations, and the Uniform Building Code (UBC).

Implementation 12-B(2): Adhere to the policies outlined in the *Medford Comprehensive Drainage Master Plan* to minimize flood losses through development controls.

Implementation 12-B(3): Encourage the re-mapping of flood-prone areas in Medford using data from the most recent flood(s) of record.

Implementation 12-B(4): Consider flood hazards when installing public improvements such as parks and paths in flood-prone areas. Design these amenities to withstand a certain flood level.

See also the Policies of the Storm Water Drainage section of the "Public Facilities Element."

Policy 12-C: The City of Medford shall continue to utilize building and development standards to mitigate the potentially damaging effects of earthquakes. New construction is required to meet the standards of seismic zone 3 of the *Uniform Building Code* (UBC).

Policy 12-D: The City of Medford shall strive to upgrade all city-owned buildings and facilities to meet earthquake standards.

Policy 12-E: The City of Medford shall continue to update and enforce noise attenuation strategies.

Implementation 12-E(1): Periodically review the City's noise ordinances for adequacy.

Policy 12-F: The City of Medford shall strive to minimize the loss of life and property resulting from wildland-urban interface fires within the Urban Growth Boundary.

Implementation 12-F(1): Undertake efforts to educate the public in wildland-urban interface fire safety.

Implementation 12-F(2): Develop and adopt fire safety performance standards for development in those areas identified as being at risk of wildland-urban interface fires.

Policy 12-G: The City of Medford shall designate future residential areas in coordination with the *Rogue Valley International-Medford Airport Master Plan* to minimize conflicts with flight patterns, hazard areas, and airport expansion areas.

Planning Commission Minutes

From Public Hearing on **September 27, 2018**

The regular meeting of the Planning Commission was called to order at 5:30 PM in the City Hall Council Chambers on the above date with the following members and staff in attendance:

Commissioners Present
Patrick Miranda, Chair
David McFadden, Vice Chair
Joe Foley
Bill Mansfield (arrived at 5:53 p.m.)
Mark McKechnie
Jared Pulver

Staff Present
Kelly Evans, Assistant Planning Director
Katie Zerkel, Senior Assistant City Attorney
Alex Georgevitch, City Engineer
Greg Kleinberg, Fire Marshal
Carla Paladino, Principal Planner
Terri Richards, Recording Secretary
Dustin Severs, Planner III
Steffen Roennfeldt, Planner III
Seth Adams, Planner III

Commissioner Absent
David Culbertson, Excused Absence
E.J. McManus, Excused Absence
Alex Poythress, Excused Absence

10. Roll Call

Commissioner McKechnie asked, has the Planning Commission seen consent calendar item 20.2 before? Vice Chair McFadden replied no.

Commissioner McKechnie requested to pull the item for discussion.

20. Consent Calendar/Written Communications.

20.1 LDS-18-085 / E-18-086 Final Orders of a tentative plat for an 11-lot subdivision on approximately 2.1 acres within the SFR-6 (Single Family Residential – 4 to 6 dwelling units per gross acre) zoning district, located on the east side of Orchard Home Drive at 1945 & 1965 Orchard Home Drive (382W02AA TL200 & 300). The project includes an Exception request to the right-of-way dimensions and reduced sidewalks width (382W02AA TL200 & 300). Applicants: Joshua and Shawna Wallace & Michael and Heather Johnson; Agent: Scott Sinner Consulting, Inc.; Planner: Steffen Roennfeldt.

Motion: The Planning Commission adopted 20.1 of the consent calendar as submitted.

Moved by: Vice Chair McFadden Seconded by: Commissioner McKechnie

Voice Vote: Motion passed, 5-0.

The public hearing was closed.

Motion: The Planning Commission adopts the findings as recommended by staff and directs staff to prepare the Final Order for approval of LDS-18-109 per the staff report dated September 18, 2018, including Exhibits A through Q.

Moved by: Vice Chair McFadden Seconded by: Commissioner McKechnie

Roll Call Vote: Motion passed: 6-0.

50.4 CP-18-063 A Comprehensive Plan Amendment to incorporate the 2017 City of Medford Natural Hazards Mitigation Plan into the Environmental Element of the Comprehensive Plan, and update the Goals, Policies, and Implementation Strategies. Applicant: City of Medford; Planner: Seth Adams.

Seth Adams, Planner III, stated that the Comprehensive Plan Amendment approval criteria can be found in the Medford Land Development Code Section 10.214 and 10.220. The applicable criteria were addressed in the staff report and hard copies are available at the entrance of Council Chambers for those in attendance. Mr. Adams gave a staff report.

The public hearing was opened and there being no testimony the public hearing was closed.

Motion: The Planning Commission based on the findings and conclusions that all of the approval criteria are either satisfied or not applicable, forwards a favorable recommendation for approval of CP-18-063 to the City Council per the staff report dated September 20, 2018, including Exhibits A through G.

Moved by: Vice Chair McFadden Seconded by: Commissioner Foley

Roll Call Vote: Motion passed: 6-0.

60. Reports

60.1 Site Plan and Architectural Commission.

Kelly Evans, Assistant Planning Director, reported that the Site Plan and Architectural Commission met Friday, September 21, 2018. Several months ago they approved a mini storage facility on Vilas. The proposal was several hundred storage containers. The applicant came back with an Exception asking for relief from the paving and buffer yard standards. The Site Plan and Architectural Commission broke it into three separate decisions. They approved two-thirds and denied the last third.

Minutes

From Study Session on **September 10, 2018**

The study session of the Medford Planning Commission was called to order at 12:00 p.m. in the Lausmann Annex Room 151-157 on the above date with the following members and staff in attendance:

Commissioners Present
Patrick Miranda, Chair
David McFadden, Vice Chair
David Culbertson
Bill Mansfield
Mark McKechnie
E. J. McManus
Jared Pulver

Staff Present
Carla Paladino, Principal Planner
Eric Mitton, Deputy City Attorney
Karl MacNair, Transportation Manager
Seth Adams, Planner III

Commissioners Absent
Joe Foley, Excused Absence
Alex Poythress, Unexcused Absence

Guest
Milan Hansen

Subject:

20.1 CP-16-036 Transportation System Plan Update

Karl MacNair, Transportation Manager reported that the presentation is from the City Council study session on August 23, 2018 regarding Transportation System Plan (TSP) project funding.

The beginning fund balance is $30 million that includes:

- Street Improvement Fund: $ 3,029,600
- Street SDC Fund: $11,736,700
- Gas Tax Fund: $15,606,900

The beginning fund balances fluctuate in response to types and funding sources of budgeted projects. The gas tax beginning fund balance is projected to be $11.3 million in the next budget.

Of the $30 million, approximately $16.7 million has encumbrances:

- Street Improvement Fund (obligated for specific projects)
- Contingency (operating contingencies)
- Obligated SDC credits for completed developer projects
- Columbus Avenue Extension
- Delta Waters Road fill-ins

Grant Funding

- City has received $42 million since 2004 (averages $3 million a year)
- State and Federal Grants

Vice Chair McFadden commented that one gains public support by showing Medford is moving forward to solve the traffic problem that people in the community feel exists.

Commissioner McKechnie feels that the HB2017 funds should be a mix. The way he understands the scenarios is that there are two choices. Either raise the utility fees to cover all the maintenance money or use all the gas tax money and do not raise the fees. Scenario #3 is all the gas tax money goes into projects and an equivalent amount is raised in utility fees. Scenario #4 does the opposite. It does not raise the utility fees and all the gas tax money goes into maintenance. He thinks a scenario that would be justified is not do Scenario #4. Do the annual grant funding on $3 million and if it turns out $1.5 million is approved then raise the utility fee just to cover the other $1.5 million. He also noticed on Scenario #3 there were 6 undesignated location projects To Be Determined (TBD). That says they do not know where they are going to spend the money. Scenario #4 toned that down and had definite locations for the money. Utility fees may need to be raised a little but they would not need to be raised to the level staff was discussing with the City Council.

Mr. MacNair stated that the 6 TBD is that there is a difference between the costs of signalization versus a street improvement project. As traffic patterns change sometimes there could be a need for a traffic signal. In the last TSP signalizations in so many locations were To Be Determined. It is a good idea for planning at this level.

Carla Paladino reported that staff is updating the draft document, updating the maps and putting in Scenario #5. City Council directed staff to bring this to the Planning Commission and other committees providing all the scenarios. If the Planning Commission chooses to pick a different scenario as their recommendation, staff will move that forward to the City Council. Staff is proposing to go to Planning Commission hearing October 11, 2018.

Vice Chair McFadden asked, is staff wanting a consensus today or is it going to hearing for a vote on which one of the six scenarios they support? Ms. Paladino reported that on Thursday, October 11, 2018 staff will present the draft with Scenario #5 but the City Council made it very clear that they wanted the Planning Commission to decide if they wanted something different. If they choose Scenario #3 then the Planning Commission would do that as part of the hearing process.

Chair Miranda stated that his direction based on the discussion is Scenario #4 as well. Commissioner McKechnie agreed.

Commissioner Pulver stated that super CAC is going to weigh in at the end of the month. Then staff will take all the information from the different bodies to the City Council. There needs to be feedback at the hearing on October 11, 2018.

20.2 CP-18-063 Natural Hazards Mitigation Plan Comprehensive Plan Amendment
Seth Adams, Planner III, reported that staff is asking the Planning Commission for direction on identifying any necessary changes to the proposal.

The proposed amendment incorporates the 2017 Natural Hazards Mitigation Plan (NHMP) into the Comprehensive Plan.

The proposed hearing schedule is Thursday, September 27, 2018 to the Planning Commission and November 1, 2018 to the City Council.

The Comprehensive Plan Environmental Element currently discusses wild land fires, air quality, flooding, landslides and earthquakes. A lot of this information has not been updated since the 1990's. Last year the City Council approved the 2017 Natural Hazards Mitigation Plan then FEMA subsequently approved it. The Plan is effective through September 12, 2022.

The Natural Hazard Mitigation Plan contains analysis of the previous hazards but now it also includes severe weather, volcanic eruption, emerging infectious diseases. The amendment incorporates (by reference) the Natural Hazards Mitigation Plan into the Environmental Element of the Comprehensive Plan. The amendment includes discussions of severe weather, volcanic eruption and emerging infectious diseases. It reflects the current information in the NHMP and condenses existing text. Finally, it updates the conclusions, goals, policies, and implementation strategies of the Comprehensive Plan.

20.3 CP-16-075 & DCA-18-120 Urbanization Plans

Carla Paladino, Principal Planner reported that the urbanization plan is a requirement that came out of the adoption of the Urban Growth Boundary expansion.

This will be a new land use process. It would adopt specific and adoptable concept plans for the new expansion areas. Help regulate and ensure compliance with the Regional Plan.

The process would be adopted as a major Comprehensive Plan amendment into the Neighborhood Element.

Land Use Actions Needed:

- Major Comprehensive Plan Amendment
  - Neighborhood Element
  - Review and Amendment Section
- Development Code Amendment
  - Articles I and II in Chapter 10

Urbanization Plan – Objective

- Adopt maps that comply with the Regional Plan
- Regional Plan requires:
  - Minimum Density (6.6 du/acre)
  - Mixed-use, Pedestrian Friendly
  - Land Use Mix

Exhibit F

RESOLUTION NO. 2017-105

A RESOLUTION adopting the 2017 Medford Natural Hazards Mitigation Plan.

WHEREAS, natural hazards threaten life, businesses, property, and environmental systems in the City of Medford; and

WHEREAS, an understanding of the nature, extent, and potential impacts of natural hazards is the foundation for developing strategies to reduce or eliminate those impacts; and

WHEREAS, natural hazards mitigation planning is the process through which such understanding and strategies are developed and a process for implementation is established in the City of Medford; and

WHEREAS, it is in the interest of the City of Medford to undertake natural hazards mitigation planning, integration, and implementation together as coordinated and multi-disciplinary planning strengthens communities and better serves us all; and

WHEREAS, the City of Medford previously prepared, implemented, and updated Natural Hazards Mitigation Plans in accordance with the Disaster Mitigation Act of 2000. These plans (approved in 2004 and 2010 respectively) were each approved by the Federal Emergency Management Agency (FEMA) for a period of five years; and

WHEREAS, the City of Medford 2010 Natural Hazards Mitigation Plan established and the 2017 Medford Natural Hazards Mitigation Plan retains "the overarching mission and purpose is to protect people, property, and the environment from the impact of natural disasters;" and

WHEREAS, the 2010 Medford Natural Hazards Mitigation Plan (formerly known as the City of Medford Pre-Disaster Mitigation Plan) is the most recent and expired on October 4, 2015; and

WHEREAS, having a natural hazards mitigation plan developed in accordance with the Disaster Mitigation Act of 2000 and approved by FEMA is a prerequisite for local government eligibility for certain federal pre- and post-disaster mitigations funds; and

WHEREAS, adoption of the updated 2017 Medford Natural Hazards Mitigation Plan is required for FEMA approval of the 2017 Medford Natural Hazards Mitigation Plan and maintained eligibility for certain federal pre- and post-disaster mitigations funds; and

WHEREAS, as a result of coordinated planning, the 2017 Medford Natural Hazards Mitigation Plan will be included in the Jackson County Multi-Jurisdictional Natural Hazards Mitigation Plan; and

WHEREAS, adoption of updated 2017 Medford Natural Hazards Mitigation Plan demonstrates the City of Medford's commitment to reducing or eliminating the potential impacts of

natural hazards and to achieving the Plan's goals; now, therefore,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MEDFORD, OREGON,

Section 1. That the 2017 Medford Natural Hazards Mitigation Plan is hereby adopted.

Section 2. The City Council hereby adopts the recitals above in support of this resolution.

PASSED by the Council and signed by me in authentication of its passage this 7 day of September, 2017.

ATTEST: _____
City Recorder

_____
Mayor

Planning Commission Minutes

From Study Session on **February 27, 2017**

The study session of the Medford Planning Commission was called to order at noon in the Lausmann Annex Room 151-157 on the above date with the following members and staff in attendance:

Commissioners Present
Patrick Miranda, Chair
David McFadden, Vice Chair
Joe Foley
Bill Mansfield
Mark McKechnie
Jared Pulver

Staff Present
Matt Binkley, Planning Director
Kevin McConnell, Deputy City Attorney
Larry Masterman, Emergency Mgt. Coordinator
Carla Paladino, Principal Planner
Chris Olivier, GSI Coordinator
Kyle Kearns, Planner II

Commissioners Absent
David Culbertson, Excused Absence
E. J. McManus, Excused Absence

Guests
Tricia Sears
Jay Harland

Subjects:

20.1 Natural Hazards Mitigation Plan

Carla Paladino, Principal Planner reported that the City is currently updating the Natural Hazards Mitigation Plan. It is a five year plan. Natural Hazards include earthquakes, floods, disease epidemics, severe weather, etc. Staff would like to see the City Council approve the Plan when it is finished this summer. The Environmental Element of the Comprehensive Plan will be updated with the Natural Hazards Mitigation Plan.

Ms. Paladino introduces Larry Masterman, Emergency Management Coordinator. He has been the lead on this project. There is a grant through DLCD. Tricia Sears is a Natural Hazard Planner with the State. She has been helping coordinate the steering committee and the written element of the update. Chris Olivier, GSI Coordinator, with the Planning Department. He took over co-chairing the steering committee with Mr. Masterman after Jim Huber retired last year.

Ms. Sears gave an overview of the process in the role of the State. She is with the Oregon Department of Land Conservation Development (DLCD). DLCD and the City of Medford are collaborating to update the existing Natural Hazard Mitigation Plan. She is responsible for managing the project including providing information, coordinating and writing the entire Plan with the assistance from the steering committee. It is important to DLCD that Medford and other jurisdictions integrate the planning and emergency management aspect of these Natural Hazard Mitigation Plans. Medford is

demonstrating a lot of innovation with this plan because Mr. Masterman and Mr. Olivier are the co-chairs of the Natural Hazard Mitigation Plan committee. The timeline is fast. It started in June of last year and will be completed by June of this year. There is a draft of the Natural Hazard Mitigation Plan out for public review. The plan is to have a revised plan of that in March. The week of April 3-7 is the targeted timeline to turn the Plan into the Oregon Office of the Emergency Management (OEM) and Federal Emergency Management Agency (FEMA). In May or June, they hope to receive an approval pending adoption letter that comes from FEMA and OEM. Then it goes to the City Council to get approval for adoption of the Natural Hazard Mitigation Plan. After that, FEMA sends an approved letter to the OEM and then provided to Medford a letter alerting them of the approval. The Plan is valid for five years.

Medford is following along the Jackson County Natural Hazard Mitigation Plan. They are in the process of updating their Plan. Ultimately, after Medford is approved it will become an annex to the Jackson County Plan.

Having a Natural Hazard Mitigation Plan is required to be able to receive both pre and post disaster funds from the Federal Emergency Management Agency. It is not required to have a Natural Hazard Mitigation Plan but it carries a big part in getting funds from FEMA in case of a disaster.

Mr. Masterman gave an overview and update on what the committee has been doing. Mr. Masterman distributed a list of the 19 members on the steering committee. Several weeks ago the City hosted a FEMA course on local Hazard Mitigation planning. It was a two day course. Twenty-one people were graduated from around the state. There was an open house that was part of the community outreach. FEMA is big on these projects involving a lot of public input.

Several geologists came and gave a tour of the most vulnerable land.

They had three separate panels at the open house. There were approximately thirty-seven people in attendance. The Mail Tribune published the wrong start time. It ran from 4:00 p.m. to 7:00 p.m. with the Mail Tribune publishing start time at 7:00 p.m. The panelists stayed for another hour. Great input from the community.

Chris Olivier, GSI Coordinator, presented fifteen draft maps. A lot of different agencies have provided data for the maps. There is a map for landslide hazard, people with access and functional needs, bridges, schools, dam inundation. There are three dams that could affect the Bear Creek Valley. Immigrant Lake dam will affect the UGB.

The Hazard Analysis Summary is updated from the fall summary. An earthquake is more likely than anything else generate hundreds or even thousands of causalities. The Cascadia Earthquake could be a magnitude of 9 or bigger. Here it might be 7 or 8. It will last four or five minutes. The amount of shaking, damage and disruptions to our systems will be tremendous. We need to plan for that.

Commissioner Mansfield asked, is the Planning Commission going to make a decision for recommendation or is it for useful information? Ms. Paladino reported that after the Plan is adopted by the City Council, staff will amend the Comprehensive Plan incorporating the Natural Hazard Mitigation Plan. The Planning Commission will forward a recommendation to the City Council on that aspect.

Commission Pulver asked, how does the ranking and scoring come into play in terms of it is utilized? Does it impact dollar allocation? Is importance put on certain preventative measures in building or design standards? Mr. Masterman stated that is what these plans are all about. It is steering all those things. Setting priorities for funding and policy regulations.

20.2 Greenway Trails Amendment Initiation

This request came out of the City's Parks and Recreation Department seeking changes. Jay Harland with CSA Planning is on a retainer with the Parks Department to help with the code amendment.

Currently the code does not talk about trail implementation, construction, maintenance, and dedication.

Mr. Harland reported that the City has stated where they would like the trails. Trails are in the City's Comprehensive Plan. Developers have shown them on their plans and it is usually a condition of approval. Moving forward, after the trails are built the Parks Department will maintain them.

Ms. Paladino stated the 2016 Leisure Services Plan has a complete chapter on paths and trials. Nationally, over the past ten years hiking and walking are basically top outdoor recreation activity that people are saying they want to do more of. Locally, it is the same trend. Eighty-one percent of respondents of the community survey indicated a need for City wide trails and improved connectivity. Seventy-four percent identified the need for bicycle facilities. The Plan indicates that residents want enhancements such as lighting, benches, line of site, etc. The Leisure Services Plan will be incorporated into the Comprehensive Plan.

There was a slide presentation of examples of trail segments.

The next steps would be that on March 9, 2017, the Planning Commission would initiate the amendment under the consent calendar. CSA Planning will begin their work. Drafts will be brought forward for review and comment. Hearing process begins.

Commissioner McKechnie stated that the developers have to pay a fee to the Parks Department. Where does that money go? Matt Brinkley, Planning Director, stated that they are SDC fees that get spent for Parks and Recreation facilities.

Medford City Council Study Session

Minutes

August 25, 2016
Medford City Hall, Medford Room
411 West Eighth Street, Medford, Oregon

The Medford City Council Study Session was called to order at 12:00 p.m. in the Medford Room of the Medford City Hall on the above date with the following members and staff present:

Mayor Gary Wheeler; Councilmembers Clay Bearnson, Daniel Bunn, Tim Jackle, Eli Matthews, Kevin Stine

City Manager Pro Tem Alison Chan; Deputy City Manager Bill Hoke, City Attorney Lori Cooper; Deputy City Recorder Winnie Shepard; Water Commission Manager Larry Rains; Planning Director Jim Huber, DLCD Natural Hazards Planner Tricia Sears; Emergency Management Coordinator Larry Masterman

Councilmembers Corcoran, Gordon and Zarosinski were absent.

Water Commission Update on Lead Issues

Water Commission Manager Larry Rains spoke regarding the status of lead issues in Medford's water.

- In May, two lead pigtails were found. A "pigtail" is a service pipe used back in the early 1900's as a flex coupling
- The Commission doesn't have records regarding pigtail locations in Medford; but began looking at every house along the waterlines on the 1946 map, approximately 5,000 meters. Staff reviewed by digging to visually determine if the pipe has a pigtail
- Some locations require a "pothole" to gain access to visually inspect the joint
- So far, 4,760 locations were walked and examined, resulting in 264 possible pothole locations. To date, the Commission has dug 47 of these locations, found 13 lead pigtails, of which 11 have been removed and the other two will be removed shortly
- The goal is to complete inspections by the end of 2016 and to find and eliminate all lead pigtails
- Testing is conducted at the tap after the water has sat for 6 hours; it is not required to test at the pigtail
    - For the first test, the pigtail was disturbed and washed. This caused the lead level to test higher than normal
- It costs approximately $15 to examine each meter; replacement fees are paid from the general maintenance fees. Each pothole costs $1,000. If a pigtail is found, it is another $5,000 to remove
- The QBS corrosion study will cost an estimated $250,000

Natural Hazard Mitigation Plan

Planning Director Jim Huber provided the background of the Natural Hazard Mitigation Plan and noted it will come back before Council for approval. Emergency Management Coordinator Larry Masterman noted the 2017 version of this plan will be the City's "go to resource" for natural hazards. It analyzes the natural hazards in our area and how to handle each of them.

- Required by FEMA to obtain grants for earthquakes, response & recovery funds
- Medford's first plan was created in 2004, was updated in 2010 and sunset last year
- City began working with the DLCD on the new plan about two years ago
- This process is very transparent and is geared to receive public involvement
- Medford, the surrounding cities and the County all have their own plans

Tricia Sears, National Hazards Planner with the Oregon Department of Land Conservation and Development, noted the following:

- Delays in beginning between FEMA and the Oregon Legislature
- The goal is to have this completed by June 2017
- She is responsible for managing the project and writing the plan
- Local jurisdictions should incorporate this plan into their core policies together with land use planning and emergency management
- A website has been created for public to submit comments
- A draft plan is expected in early October, containing the community profile and the risk assessment
- An open house is planned for January of 2017
- Ms. Sears will seek an approval letter from FEMA in May
- The Plan keeps community flood insurance costs lower and assists in obtaining FEMA grants

City Manager Pro Tem Alison Chan explained this plan should help the City receive federal help in the event of an emergency.

The meeting adjourned at 12:32 p.m.

Winnie Shepard
Deputy City Recorder

Planning Commission Minutes

From Study Session on **August 22, 2016**

The study session of the Medford Planning Commission was called to order at noon in the City Hall Medford Room 330 on the above date with the following members and staff in attendance:

Commissioners Present
Patrick Miranda, Chair
David McFadden, Vice Chair
Tim D'Alessandro
David Culbertson
Joe Foley
Bill Mansfield
Mark McKechnie
Jared Pulver

Guest
Tricia Sears, Oregon Department of Land Conservation and Development

Staff Present
Jim Huber, Planning Director
Eric Mitton, Senior Assistant City Attorney
John Adam, Principal Planner
Larry Masterman, City Emergency Management Coordinator
Chris Olivier, GIS Coordinator
Carla Paladino, Planner IV

Subject

1. **National Hazards Mitigation Plan**

Jim Huber, Planning Director stated there are three items on today's agenda. The National Hazards Mitigation Plan, Wetland Regulations and time permitting a discussion on the resolution that City Council adopted regarding transitional housing.

Mr. Huber introduced Tricia Sears, National Hazards Planner with the Oregon Department of Land Conservation and Development (DLCD) and Larry Masterman, City of Medford Emergency Management Coordinator.

This subject is part of the public outreach program. This is a plan that will be adopted by the City Council. In the Comprehensive Plan is the Environmental Element. In the Environmental Element there is a section called Disasters and Hazards. The three areas that overlap are floods, earthquakes and wildfires. The Environmental Element also has a section on noise and airport hazards. The National Hazards Mitigation Plan will continue further such as severe weather, air quality, landslides, volcanic eruptions and disease outbreaks. In the future this section in the Comprehensive Plan may need updating to include some information from the National Hazards Mitigation Plan and may want to adopt it by reference into the Comprehensive Plan. It is not mandatory.

Larry Masterman, City of Medford, Emergency Management Coordinator reported that the National Hazards Mitigation Plans are a relatively recent opportunity from FEMA. It is as a lot of other emergency preparedness mitigation response program driven by funding. The National Hazards Mitigation Plan is a requirement for a number of mitigation grant programs and a condition for some federal reimbursement for emergency response recovery mitigation activities.

Medford did its first mitigation plan in 2004 under federal regulations. An approved plan has to be updated every five years. It was approved again in 2010 and that plan sunset last year. Staff has been talking with DLCD for approximately two years about their partnership and updating the plan. DLCD obtained a grant from FEMA to help Medford and several other jurisdictions in the State updating their plans.

The County has a separate version of the same plan. They will be updating their plan next year and the City will roll into that. The City of Medford will have an annex to that County plan. The City does not have a lot of hazards shared by the rest of the County and vice versa. The City does not have as much flood risks as many parts of the County.

Under the Federal guidance this needs to be an inclusive program with a lot of public input. The steering committee includes members of the public. There are people on the steering committee from the City. The US Army Corps of Engineers operates the Lost Creek Dam. The steering committee also includes the American Red Cross and Eric Dittmer, retired professor from SOU in earth sciences and seismology. He is the "go-to" person on earthquakes and geological issues. There is a nice cross section of participation.

Why do this at all? This will not prevent most disasters. Mitigation is all things one does for and during an event to reduce the impacts, loss of life, damage to property and economic impacts. Where the Planning Commission is concerned it might include changing land use especially when talking about repetitive loss areas that keep getting flooded. The federal funds are not going to continue rebuilding. They want to reduce or eliminate the long term risks and maintain eligibility for both the pre-disaster and post-disaster funding. FEMA will reimburse the City for a residentially declared disaster. They will reimburse 75% of the extraordinary expense costs over time.

One of the discussions regarding the land use was the amount of development that has occurred on slopes of 25% or greater between 2009 to present.

Tricia Sears, Oregon Department of Land Conservation and Development reported that it is important to DLCD element that local jurisdictions are integrating planning aspects through emergency management of the National Hazards Mitigation Plan.

Ms. Sears is responsible for collecting a lot of information and writing the Plan. The goals and mission is to accomplish this by June 30, 2017. The goals are from the 2010 Plan that is being used to update the Plan.

Ms. Sears emphasized that this updated National Hazards Mitigation Plan will keep Medford eligible for the pre and post mitigation funding which is valuable in terms of money provided to the City in times of need. It also helps the flood community rating systems. It keeps the City eligible for the flood plains which is also critical.

The first draft is expected in early October.

Commissioner D'Alessandro commented that he is happy to hear that this is a collaborative effort that Medford and Jackson County will be pooling their resources towards a common goal. In reviewing the list there is a great mix of people and diversity. He does not see public transportation as represented as part of the steering committee. It is his opinion that transportation would be a large part of the solution in a lot of the scenarios. Mr. Huber reported that currently the group is looking at the Transportation Element with the help of the Engineering Department. It would not be a bad idea to put RVTD on the steering committee.

Mr. Huber stated that regarding the schedule they are speaking to the news and City Council on Thursday, August 25, 2016. The community profile and risk assessment portion of the Plan will be done by the end of October. The mitigation strategy and plan maintenance will be completed by January 31 and a draft by the end of March. It is an aggressive timeframe.

2. **Wetland Regulations**

Carla Paladino, Planner IV, reported that in May of 2016, the Planning Commission reviewed changes to the Environmental Element of the Comprehensive Plan regarding wetlands. The report went to the State last November. It was reviewed by the State and sent back to the consultants for changes and updates. It was resubmitted to the State in July of this year. Staff is waiting for the approval of a Local Wetland Inventory for the entire Medford Urban Reserve.

The City Council in March agreed to the locations of the urban growth boundary expansion areas. Last week the City Council approved the findings and ordinance. As part of the requirements for Goal 5, reviewing natural resources, wetlands and historic sites, staff is conducting updates to the Comprehensive Plan and Wetland Regulations.

The existing riparian corridor regulations have been modified to include wetlands. Part of the discussion today is how this works when a development is submitted and the changes are proposed.

- Updated definitions
- Revisions to the purpose statements
- Extensions of riparian corridors along identified creeks

CITY OF MEDFORD
AGENDA ITEM COMMENTARY

www.ci.medford.or.us

Item No: 40.4

DEPARTMENT: Planning
PHONE: (541) 774-2380
STAFF CONTACT: Matt Brinkley, AICP CFM, Director

AGENDA SECTION: Public Hearings
MEETING DATE: November 1, 2018

COUNCIL BILL 2018-126
An ordinance adopting a revised Transportation System Plan (2018-2038) and approving a legislative amendment to the Transportation Element, Public Facilities Element, and the Conclusions, Goals, Policies, and Implementation Strategies of the Medford Comprehensive Plan.

SUMMARY AND BACKGROUND
The City Council is being asked to consider a legislative amendment to adopt a revised Transportation System Plan (TSP) 2018–2038 and amend applicable portions of the Comprehensive Plan including the Transportation Element (the new TSP will replace this element), the Public Facilities Element, and the Goals, Policies, and Implementation Element.

The current plan adopted in 2003 is outdated. Due to anticipated growth within the City limits and in the expanded Urban Growth Boundary, the City requires an updated transportation plan that reflects the City's transportation goals and identifies priority projects to be constructed over the next 20 years.

The City Council held 14 study sessions on the Transportation System Plan from July 2017 through August 2018 to discuss different aspects of the plan and provide direction to staff. The plan has been coordinated with the Joint Transportation Subcommittee/Citizen Advisory Committee (JTS/CAC), Technical Advisory Committee (TAC), Bicycle and Pedestrian Advisory Committee (BPAC), Planning Commission (PC) and the public. (File No. CPA-16-036)

PREVIOUS COUNCIL ACTIONS
On July 6, 2017, Council Bill 2017-71 was approved establishing the composition of the Technical Advisory Committee (TAC) as one of the City Council's advisory groups for the Transportation System Plan (TSP) project.

On August 17, 2017, Council Bill 2017-95 was approved expanding the composition of the Joint Transportation Subcommittee (JTS) serving as the Citizen Advisory Committee (CAC) to include broader representation of community members and organizations.

Study sessions regarding the Transportation System Plan were held on the following dates:

July 6, 2017	January 25, 2018
July 20, 2017	February 22, 2018
August 10, 2017	March 22, 2018
August 17, 2017	March 29, 2018 with Planning Commission
September 14, 2017	May 24, 2018
October 12, 2017	June 28, 2018
November 30, 2017	August 23, 2018

ANALYSIS
The proposed Transportation System Plan 2018–2038 will replace the 2003 plan and is intended to be more flexible and user-friendly than the current version in order to address changes in community needs, priorities, and funding sources over time. The need for a revised plan is in response to several different factors including adoption of the Regional Plan in 2012, the approved expansion of the Urban Growth Boundary by the City in 2016 and subsequent acknowledgement by the State in 2018, and updated modeling that anticipates future population growth.

Volume I of the document is organized into six sections and applicable attachments. The sections provide information about the following topics:

- Introduction
- Visions, Goals, Objectives, and Action items
- Existing Conditions and Future Needs Assessment
- Transportation Funding and Implementation
- Transportation Plans for Auto, Freight, Rail, Transit, Pedestrian, Bicycle, Air and other modes
- Key Code and Policy Amendments

The supporting background data, technical memoranda, and analysis of the plan are found in Volume II of the document.

Some of the highlights of the plan include:

- Amended goals and objectives that will help guide future actions and projects related to the transportation system,
- Maintaining a Level-of-Service standard D for nearly all of the City's intersections with the exception of two that will maintain a Level-of-Service standard E,
- A Pedestrian and Bicycle Level of Traffic Stress analysis that evaluates the comfort level of sidewalks and bicycle facilities within the community,
- Modifications to the cross sections for major and minor arterials which includes a preferred option that separates the bicycle facilities to an off-road location,
- A revised Functional Classification map,
- Lists of new projects separated into Tier 1 (funded) and Tier 2 (unfunded) projects
- Addressing other transportation modes such as transit, freight, and air travel, and
- Establishing a process referred to as legacy streets to evaluate how existing streets are retrofit over time and ensuring the various modes of transportation are constructed to serve all users.

The Planning Commission held a hearing on the Transportation System Plan on October 11, 2018. Public testimony was provided by nine citizens and new exhibits were entered into the record. Concerns were raised by many of the speakers noting that the City's bicycle facilities need to be improved and provided to serve a broader segment of the population. Other citizens spoke in favor of the project. The Planning Commission forwarded a favorable recommendation of the project to the City Council in a vote of 6-1.

Issues of Note and Exhibits

- (Exhibit G) The Siskiyou Velo Bicycle Club provides testimony indicating the City's Transportation System Plan does not meet the Transportation Planning Rule requirements related to bicycle facilities.
- (Exhibit N) The Legal Department has provided a memorandum regarding legal review of the TSP goals and objectives.
- (Exhibit O) CSA Planning submitted e-mail correspondence regarding proposed local street connections proposed in Figure 23 and Table 23 (Projects L11 and L12). These two local street connections are proposed across Jackson County Airport property. The site contains a large wetland that will make it difficult to make these proposed connections. It is requested that these street projects either be removed from the plan or consolidated into one project and re-routed around the wetland location. The plan can be modified to reflect these changes. Council will be asked to consider these modifications.
- (Exhibit P) Planning Department staff addresses Siskiyou Velo's testimony in a separate memorandum.

- Prior to the Planning Commission hearing, staff discussed the project description of the South Stage overcrossing with ODOT staff. Project 537 for the South Stage Road overcrossing has been divided into two projects in the project list. The first is Project 537a which discusses the environmental process and right-of-way acquisition portion of the project and identifies this work to occur in the short term (next five years). The second is Project 537b which is the proposed road construction portion of the project and places this project in the long term category (over the 20 year planning period). Other related road or intersection projects associated with the South Stage project have been adjusted as well. These include projects 609, 610, I-45, and I-73 being placed in the midterm category (5-10 years) and projects 611, 721, I-13, and I-24 being placed in the long-term category.
- In addition, ODOT provided comments via e-mail for the plan to be enhanced related to the alternative measures provisions identified in OAR 660-012-0035(7). The TSP provides an overview of these provisions that the City participates in regionally through the Rogue Valley Metropolitan Planning Organization (pages 29 and 30 of the plan). Staff has enhanced the language tying the goals and objectives and project list to the City's efforts in trying to accomplish the identified regional benchmarks.

FINANCIAL AND/OR RESOURCE CONSIDERATIONS

The plan estimates $88.4 million dollars (Scenario 5) is available in capital revenue for the 20 year planning period. The Planning Commission recommended Scenario 5 during their October 11, 2018, public hearing. As requested during the Council study session on August 23, 2018, all of the proposed funding scenarios are included in the report for further discussion and decision by the City Council. The table summarizes the scenarios below.

Scenario #	HB2017 (State Transportation Revenue – Gas Tax increase)	Annual Grant Funding	20-year Revenue Available for Capital Projects	Difference from Scenario 1
1	Projects	$700,000	$72,440,343	$0
2	Maintenance	$700,000	$35,859,063	($36,581,280)
3	Projects	$3,000,000	$118,440,343	$46,000,000
4	Maintenance	$3,000,000	$81,859,063	$9,418,720
5	Projects	$1,500,000	$88,440,343	$16,000,000
6	Maintenance	$1,500,000	$51,859,063	($20,581,280)

TIMING ISSUES

A new Transportation System Plan is one of the necessary steps required before lands within the newly expanded Urban Growth Boundary can be annexed and developed.

COUNCIL OPTIONS

- Approve the ordinance as presented
- Modify the ordinance as presented
- Deny the ordinance as presented and direct staff regarding further action

STAFF RECOMMENDATION

Staff recommends approval of the ordinance.

SUGGESTED MOTION

I move to approve the ordinance adopting a revised Transportation System Plan 2018–2038 and amending the applicable portions of the Comprehensive Plan including the Transportation Element, the Public Facilities Element, and the Goals, Policies, and Implementation Element.

EXHIBITS

Ordinance
Council Report, including Exhibits A–P

ORDINANCE NO. 2018-126

AN ORDINANCE adopting a revised Transportation System Plan (2018-2038) and approving a legislative amendment to the Transportation Element, Public Facilities Element, and the Conclusions, Goals, Policies, and Implementation Strategies of the *Medford Comprehensive Plan.*

WHEREAS, the City Council has determined that the proposed Transportation System Plan satisfied the applicable criteria as demonstrated by the Findings and Conclusions which are on file in the City of Medford Planning Department and incorporated herein by reference and which are adopted as the findings and conclusions of the City Council; now, therefore,

THE CITY OF MEDFORD ORDAINS AS FOLLOWS:

Section 1. That the Transportation System Plan (2018-2038) is hereby adopted.

Section 2. That the Transportation System Plan (2018-2038), replaces the Transportation Element in its entirety and is hereby adopted as part of the *Medford Comprehensive Plan.*

Section 2. The approval is based upon the Findings and Conclusions of Law included in the Council Report dated October 25, 2018, attached as Exhibit A and incorporated herein.

PASSED by the Council and signed by me in authentication of its passage this _____ day of _____, 2018.

ATTEST: _____ _____
City Recorder Mayor

APPROVED _____, 2018. _____
Mayor

COUNCIL REPORT

for a Type IV legislative decision: Major Comprehensive Plan Amendment

Project	Transportation System Plan	
File no.	CPA-16-036	
To	Mayor and City Council	*for 11/01/2018 hearing*
From	Planning Commission via Carla Angeli Paladino CFM, Principal Planner	
Reviewer	Matt Brinkley CFM AICP, Planning Director	
Date	October 25, 2018	

BACKGROUND

Proposal

A legislative amendment to adopt a revised Transportation System Plan (TSP) for the planning period 2018–2038 and amend applicable portions of the Comprehensive Plan including the Transportation element, Public Facilities element, and the Goals, Policies, and Implementation element (Exhibits A, B, and C). The updated TSP will replace the existing Transportation Element in its entirety.

The Transportation System Plan documents (Volumes I and II), attachments, and appendices can be found at the link below: http://www.ci.medford.or.us/Page.asp?NavID=4168.

History 2010-2018

Work began to update the Transportation System Plan in 2010. The State awarded the City a grant to begin evaluating transportation needs related to the City's proposed Urban Growth Boundary expansion. That same year, Kittelson and Associates (KAI) was hired to work on the project and both a Technical Advisory Committee (TAC) and Citizen Advisory Committee (CAC) were established to review information. Transportation modeling was started, but issues began to arise in 2011 causing a nearly two year delay in the project and requiring the grant funding to be renegotiated. The original TAC and CAC were disbanded and a new Joint Transportation Subcommittee (JTS) was created to serve in the role of the CAC.

EXHIBIT A

By 2015, Kittelson provided an analysis for evaluation of the proposed expansion areas in the Urban Growth Boundary. In 2017, the City hired KAI to write the transportation document. Council re-established a Technical Advisory Committee and expanded the membership of the JTS, known as the Super CAC. Staff outlined and implemented a public outreach campaign for the project and transportation topics of interest were discussed through a series of study sessions and meetings with the City Council, Planning Commission, and advisory committees starting in 2017 through 2018.

The existing transportation plan was adopted in 2003 and is nearing its 20-year planning horizon. Due to anticipated growth within the City limits and in the expanded Urban Growth Boundary, the City requires an updated transportation plan that incorporates new data from the regional model, reflects the City's transportation goals, and identifies priority projects to be constructed over the next planning period.

The Planning Commission and City Council have worked with staff to draft the plan over the past several years and recognize its relevance to aid in the future growth of the community.

Authority

This proposed legislative land use action is a Type IV Major Comprehensive Plan Amendment. The Planning Commission is authorized to recommend, and the City Council to approve, amendments to the Comprehensive Plan under Medford Municipal Code §§10.214 and 10.220.

ANALYSIS

Medford is the largest city in the region and meets the housing, employment, and recreational needs of residents and visitors alike. As such, the City must ensure a transportation system that meets the needs of a variety of users and a growing community. The 2018-2038 Transportation System Plan is needed to address future growth and provide direction on the improvement of the transportation system over the next 20 years.

PLANNING COMMISSION HEARING

The Planning Commission held a hearing on the project on October 11, 2018. Nine citizens spoke regarding the project with many expressing concerns with the City's existing bicycle infrastructure and requesting a more robust system to accommodate users of all ages and abilities. Some of the speakers spoke in favor of the project. Several new exhibits have been added into the record. The Commission recommended the City Council adopt the plan in a 6-1 vote.

The Siskiyou Velo Bicycle Club provided testimony indicating the City's Transportation System Plan does not meet the Transportation Planning Rule requirements related to bicycle facilities (Exhibit G). The Planning Department staff has responded to Siskiyou Velo's concerns in a separate memorandum (Exhibit P).

Prior to the Planning Commission hearing, staff discussed the project description of the South Stage overcrossing with ODOT staff. Project 537 for the South Stage Road overcrossing has been divided into two projects in the project list. The first is Project 537a, which discusses the environmental process and right-of-way acquisition portion of the project and identifies this work to occur in the short term (next five years). The second is Project 537b, which is the proposed road construction portion of the project and places this project in the long-term category (over the 20 year planning period). Other related road or intersection projects associated with the South Stage project have been adjusted as well. These include projects 609, 610, I-45, and I-73 being placed in the midterm category (5-10 years) and projects 611, 721, I-13, and I-24 being placed in the long-term category.

In addition, ODOT provided comments via e-mail for the plan to be enhanced related to the alternative measures provisions identified in OAR 660-012-0035(7). The TSP provides an overview of these provisions that the City participates in regionally through the Rogue Valley Metropolitan Planning Organization (pages 29 and 30 of the plan). Staff has enhanced the language tying the goals and objectives and project list to the City's efforts in trying to accomplish the identified regional benchmarks.

A new exhibit is included in the record that was received after the Planning Commission hearing. CSA Planning submitted e-mail correspondence regarding the local street connections considered in Figure 23 and Table 23 (Projects L11 and L12). These two local street connections are proposed across Jackson County Airport property. The site contains a large wetland that will make it difficult to make these future connections. It is requested that these street projects either be removed from the plan or consolidated into one project and re-routed around the wetland location. The plan can be modified to reflect these changes. Council will be asked to consider these modifications during the hearing (Exhibit O).

The Legal Department has provided a memorandum regarding legal review of the TSP goals and objectives (Exhibit N).

FINDINGS AND CONCLUSIONS

Applicable criteria

For the applicable criteria the Medford Municipal Code §10.218 redirects to the criteria in the "Review and Amendments" chapter of the Comprehensive Plan. The applicable criteria in this action are those for conclusions, goals and policies, and implementation strategies. The criteria are set in *italics* below; findings and conclusions are in roman type.

Comprehensive Plan, Review and Amendments chapter: Amendments [to Conclusions] shall be based on the following:

1. *A change or addition to the text, data, inventories, or graphics which substantially affects the nature of one or more conclusions.*

   Findings

   The updated Transportation System Plan for the plan years 2018-2038 is proposed to replace the existing plan adopted in 2003. The development of the plan over the years is reflective of several different factors including adoption of the Regional Plan in 2012, the approved expansion of the City's Urban Growth Boundary by the City in 2016 (County in 2017) and by the Department of Land Conservation and Development in 2018, and updated modeling that anticipates future population growth. The plan summarizes the projects needed to ensure a transportation system that accommodates all modes such as walking, biking, and driving as well as considerations for freight, air, and transit that also contribute to the overall system.

   The document is intended to be more flexible and user-friendly than the current version in order to respond when community needs, priorities, and funding sources change over time. Some of the new or revised elements of the plan include: updates to the Level-of-Service (LOS) standard; new roadway cross-sections; amended goals, objectives, and actions items; and a revised Functional Classification map.

   The document is divided into two volumes. Volume I is the main document which is organized into six sections and attachments. Within Volume I reside the goals and objectives; existing conditions analysis; project list; funding sources; and the City's plans for auto, freight, bike, pedestrian, transit, and other modes of transportation. Volume II is the appendix to the main document and provides the background data, technical memoranda, and analysis for the plan.

The new plan will replace the old document in its entirety. The applicable sections of the Comprehensive Plan including the Transportation element, Public Facilities element, and Goals, Policies, and Implementation Strategies sections of the plan will also be updated.

Conclusions

Criterion 1: Satisfied. A new Transportation System Plan is needed to reflect changing conditions and future growth within the City limits and Urban Growth Boundary. The plan outlines the City's vision for a transportation system to serve the future needs of the community. It also estimates the funding sources that will help pay for the priority projects identified for the various modes. The new plan will supersede the existing plan and serve the City over the 2018–2038 planning period.

Comprehensive Plan, Review and Amendments chapter: Amendments [to Goals and Policies] shall be based on the following [criteria 1–6]:

1. *A significant change in one or more Conclusion.*

Findings

The various elements (e.g. Public Facilities, Economic, and Housing) of the Comprehensive Plan include summary conclusions related to each particular topic. The existing Conclusions section identified in the Transportation Element contains three conclusions related to Transit Oriented Districts (TOD), and the language is taken directly from the 2003 Transportation System Plan. The updated plan does not include this specific TOD language and is proposed to be replaced with new conclusions based on the revised plan.

Twelve new conclusion statements are proposed that reference various topics covered in the Transportation System Plan. The conclusions include items such as the need for coordination among the City, County, and State in order to meet the transportation needs of the public, modified cross sections (for higher order streets), an updated Functional Classification plan that identifies the existing and proposed higher order street network. The conclusions also discuss the City's Level of Service (LOS) standards, activity centers to meet the goals of the Regional Transportation Plan (RTP) related to alternative measures, and the importance of improving safety and mobility through intersection improvements, installing sidewalk and bicycle facilities, and by complying with the Americans with Disability Act (ADA) requirements. The conclusions also include statements recognizing the importance of transit, as well as air, rail, and pipeline, and Transportation Demand Management, in reducing demand on the system and the use of Transportation System Management in getting the most out of the built environment. The conclusions also mention the priority project list to help accommodate a growing City and ways to address retrofitting existing streets to incorporate missing modes. All the

conclusions provide an overview of the Transportation System Plan and how the plan will meet the needs of the community.

Conclusions

Criterion 1: Satisfied. The Conclusions section has been revised to reflect the major components of the updated 2018-2038 Transportation System Plan.

2. *Information reflecting new or previously undisclosed public need.*

Findings

The City recently received State approval to expand its Urban Growth Boundary. This expansion of approximately 4,000 acres will accommodate additional growth for the next two decades and will require new and upgraded transportation facilities.

The updated plan considers existing conditions throughout the City and future needs within expansion areas. The plan provides a summary table of the estimated revenues, fixed expenditures, and funds available to construct priority ("Tier 1" funded) projects over the planning period.

The original 20-year revenue projections allocated for capital projects totaled $72,440,343 (referred to as the "baseline scenario" or Scenario 1). Staff was asked to provide additional funding scenarios that would offset the need to increase street utility fees that fund road maintenance by using the new State Transportation Revenue House Bill 2017. The Engineering Department drafted five additional revenue scenarios and project lists that alternate the use of HB 2017 funds towards maintenance or projects. In addition, staff varied the annual grant funding assumption of $700,000 in the baseline scenario to $1,500,000 and $3,000,000, respectively, based on a historical average over a 14 year period. The memorandum dated August 2, 2018, provides the complete overview of this topic along with corresponding project lists (Exhibit D). The scenario summary is provided below.

Scenario #	HB2017	Annual Grant Funding	20-year Revenue Available for Capital Projects	Difference from Scenario 1	Exhibits*
1	Projects	$700,000	$72,440,343	$0	1a, 1b
2	Maintenance	$700,000	$35,859,063	($36,581,280)	2a, 2b, 2c
3	Projects	$3,000,000	$118,440,343	$46,000,000	3a, 3b, 3c
4	Maintenance	$3,000,000	$81,859,063	$9,418,720	4a, 4b, 4c
5	Projects	$1,500,000	$88,440,343	$16,000,000	5a, 5b, 5c
6	Maintenance	$1,500,000	$51,859,063	($20,581,280)	6a, 6b, 6c

*Exhibits are attached to Exhibit D

The City Council reviewed and discussed the scenarios at a study session on August 23, 2018. Based on feedback from several members of the Council, Scenario 5 was selected as the preferred alternative to incorporate into the TSP over the baseline Scenario 1. However, recognizing the value in each of the proposed scenarios, Council directed staff to provide the different scenarios to the Planning Commission, Technical Advisory Committee, and Joint Transportation Committee/Citizen Advisory Committee for review and comments and to incorporate the different scenarios into the report for Council consideration during the hearing process.

On September 10, 2018, the Planning Commission was presented the above information and several of the members voiced support for Scenarios 3 or 4, understanding their role to provide a more formal recommendation during the hearing.

On September 26, 2018, the Joint Transportation Committee/Citizen Advisory Committee reviewed the information and there was strong support and a lot of discussion to continue funding street maintenance at the City's current level. Regarding the funding scenarios, six members recommended support of Scenario 5 and four members supported Scenario 4 for consideration.

On September 27, 2018, the Technical Advisory Committee reviewed the information and again there was a strong emphasis placed on allocating funds to ensure maintenance is prioritized. Of the members in attendance, three were supportive of Scenario 6 and one member was supportive of Scenario 5.

On October 11, 2018, the Planning Commission recommended in favor of Scenario 5 during their deliberations.

A major component of the Transportation System Plan is the projected revenues and selection of priority projects to be constructed. The priority projects ensure the City's overall Level-of-Service (LOS) standard "D" is maintained (with the exception of two intersections located at South Pacific Highway/Stewart Avenue and Highland Drive/Barnett Road which could be downgraded to LOS "E") throughout the community and key streets are upgraded and improved to meet the needs of a growing City and regional center.

Conclusions

Criterion 2: Satisfied. The City is projected to grow and develop especially in the new Urban Growth Boundary (UGB) expansion areas. The need to plan for future growth requires the City to select key projects that will strategically aid in maintaining a functioning transportation system that will accommodate all users across the entire community.

A significant change in community attitudes or priorities.

Findings

For nearly two decades, the City worked toward the goal of expanding its Urban Growth Boundary. Several key factors, including adoption of the Regional Plan in 2012, helped to move that goal one step closer to reality. In 2016, the City Council adopted a proposal to expand its UGB and by 2018 the State acknowledged it. Updating the Transportation System Plan and evaluating how the transportation system will be affected by future growth in the expansion areas and throughout the City is a community priority.

Over the past year, the City completed a robust public outreach plan to gain feedback and input on the updated transportation plan. Public input was received through a multi-pronged approach that included open houses, public events, and online surveys that began with feedback about the goals and objectives, included input into project prioritization, and review of the draft document. In addition, staff met regularly with the Joint Transportation Subcommittee/Citizen Advisory Committee (JTS-CAC) and Technical Advisory Committee (TAC); these two committees were heavily invested in providing comments and recommendations into the document.

Furthermore, the City Council took a leadership role in reviewing and modifying the new goals, objectives, and action items that helped set the tone for the plan and the type of transportation system the City is striving to achieve.

Information received as part of the on-line survey indicates that residents of Medford use all available modes of transportation with the top three modes being vehicles, bicycles, and walking. The plan provides for the installation of new and enhanced facilities to serve all three of these modes and others.

Conclusions

Criterion 3: Satisfied. The City successfully completed the expansion of the Urban Growth Boundary amendment in 2018. In order to ensure orderly development and to meet the needs of future growth, a revised transportation plan must be adopted. The document outlines these new factors and provides guidance into how the system will be improved and expanded upon over the next twenty years.

3. *Demonstrable inconsistency with another Plan provision.*

Findings

Transportation is a Category "A" facility in the Comprehensive Plan. Category "A" facilities are key physical facilities necessary for urban development. The topic is

identified in several of the Comprehensive Plan elements including the Environment, Housing, Public Facilities, and Transportation elements. Generally, transportation is linked in some way to these other elements. For example, in the Environment element transportation issues relate to ways to reduce greenhouse gas emissions or noise factors.

Minor changes are being sought within the Public Facilities element to update the text. The updated Transportation System Plan will replace the existing text in the Transportation element in its entirety. Provisions found within the existing Transportation element that are still applicable, such as adopted circulation maps or reference to the Rogue Valley International Airport's adopted master plan, have been carried forward into the updated plan. Any conflicts found within the various elements have been amended or completely replaced to resolve any inconsistencies within the Comprehensive Plan.

Conclusions

Criterion 4: Satisfied. The topic of transportation is identified throughout the various elements of the Comprehensive Plan. Changes to text or replacement of an entire element are proposed in order to maintain consistency within the Comprehensive Plan document.

4. *Statutory changes affecting the Plan.*

Findings

Transportation planning is one of the 19 Statewide Planning Goals and is specifically addressed in the Oregon Administrative Rules found in 660-012-0000 through 660-012-0070 (also known as the Transportation Planning Rule "TPR") and within applicable Oregon Revised Statutes. These provisions outline how local jurisdictions and Metropolitan Planning Organizations (MPOs) coordinate land use and transportation systems to increase transportation options. The City of Medford is located within the Rogue Valley Metropolitan Planning Organization (RVMPO) and can be affected by changes in state rules.

The State created an advisory committee to evaluate amendments to the Transportation Planning Rule governing metropolitan areas. Engineering staff has been a participant on the State's Rulemaking Advisory Committee which started in 2016. The original work looked at updating greenhouse gas reduction targets adopted in 2017 and then moved onto clarifying procedures in the TPR. On September 11th, a letter from the Department of Land Conservation and Development was provided to the committee members stating the rulemaking would be placed on hold until after the 2019 legislative session, due to confusion on the substance of the rule changes.

The existing administrative rules that govern transportation planning are still in effect and will be evaluated against the City's updated Transportation System Plan to show compliance. Prior to the City Council hearing, City's Legal staff will provide a memorandum indicating their review of the updated TSP against the TPR regulations.

Conclusions

Criterion 5: Satisfied. The City's plan must adhere to applicable federal and state regulations related to transportation planning. There are no administrative rule changes related to the Transportation Planning Rule that affect the City's updated Transportation System Plan. The City's plan will show compliance with the existing applicable rules.

5. *All applicable Statewide Planning Goals.*

The City is proposing to update the Comprehensive Plan and adopt a new Transportation System Plan (TSP). This action will effectively amend the City's state-acknowledged Comprehensive Plan. The findings below explain that the updated TSP is found to be consistent with the relevant Statewide Land Use Planning Goals.

Goal 1—Citizen Involvement

Goal 1 requires the development of a citizen involvement program that is widespread, allows two-way communication, provides for citizen involvement through all planning phases, and is understandable, responsive, and funded.

Findings

The review of the TSP update was guided by the appointment of the Joint Transportation Subcommittee as the Citizen Advisory Committee in 2011. This nine-member committee was later expanded in 2017 to a 25-member committee referred to as the Joint Transportation Subcommittee-Citizen Advisory Committee (JTS-CAC) or Super Citizen Advisory Committee. Representatives from surrounding jurisdictions, the County, State, school district and other agencies made up the 11-member Technical Advisory Committee who helped guide the technical aspects of the plan. Both the JTS-CAC and TAC were responsible for reviewing and providing feedback on all major topics related to the plan such as prioritization of projects. The original JTS group was responsible for drafting the original set of goals, objectives, and action items, and had been meeting for several years. The expanded JTS-CAC met eight times over the course of the project starting in 2017. The TAC met seven times between 2017 and 2018.

All meetings were open to the public and provided an opportunity for citizens to offer comments and share ideas including a presentation from the Siskiyou Velo organization related to the National Association of City Transportation Officials

(NACTO) guidebook released in 2017 related to Designing for All Ages and Abilities bicycle facilities.

As noted in Criterion 3 above, the City also sought feedback from its citizens through a diverse outreach campaign that included six open houses. Staff attended four public events, and conducted two on-line forums, including a community survey that produced over 1,000 responses.

In addition, the Planning Commission and City Council met during regular study sessions to discuss the progress of the plan and provide direction. Altogether, 20 study sessions were held between these review bodies.

A minimum of two public hearings will be held to discuss this proposal providing additional opportunity for input by residents and agencies. The Planning Commission will provide a recommendation for the City Council's consideration.

A social media campaign has provided a means for those in support of the "all ages and abilities" bicycle facilities guidebook produced by NACTO to provide comments. The City has received over 100 e-mails from residents within Medford and throughout the region voicing their support for an enhanced bicycle network (See Exhibit F for names and comments from citizens). A memorandum dated May 14, 2018, from the Bicycle and Pedestrian Advisory Committee also indicates support for the Goals and Objectives to show a review of the NACTO document when the City considers the installation of bicycle facilities (See Exhibit E). The action item that reflects this language is found in 12-d of the TSP Goals and Objectives.

Conclusions

Goal 1: Satisfied. The development of the plan has included a strong citizen involvement component that included input from the JTS-CAC, TAC, Bicycle and Pedestrian Advisory Committee (BPAC), Planning Commission, City Council and citizens. The hearing process also provides additional opportunities for citizen involvement.

Goal 2—Land-use Planning

Goal 2 requires that a land use planning process and policy framework be established as a basis for all decisions and actions relating to the use of land. All local governments and state agencies involved in the land use action must coordinate with each other. City, county, state and federal agency and special districts plans and actions related to land use must be consistent with the comprehensive plans of cities and counties and regional plans adopted under Oregon Revised Statues (ORS) Chapter 268.

Findings

The transportation network in Medford is a diverse system that is owned, managed, and/or operated by a number of jurisdictions, entities, and agencies. The relevant

state, regional, county, and local plans, projects, and studies were reviewed and evaluated to guide the development of the TSP (Volume II, Appendix A for Summary of Documents Reviewed). The City coordinated development of this plan with a number of stakeholders including the Mayor and City Council, the Project Management Team, and the Technical Advisory Committee (TAC). The membership of the TAC included broad representation from the agencies listed below.

- Oregon Department of Transportation (ODOT)
- Jackson County Roads & Greenway; Planning
- City of Central Point
- City of Phoenix
- Department of Land Conservation and Development
- Rogue Valley Metropolitan Planning Organization
- Rogue Valley Transit District
- Freight
- Medford School District 549c

Conclusions

Goal 2: Satisfied. The City has effectively coordinated the development of the TSP document with the applicable state, regional, and local partners who were represented on the Technical Advisory Committee.

Goal 3—Agricultural Lands does not apply in this case.
Goal 4—Forest Lands does not apply in this case.
Goal 5 – Natural Resources, Scenic & Historic Areas, and Open Spaces does not apply in this case.
Goal 6 – Air, Water, and Land Resources Quality does not apply in this case.

Goal 7—Areas Subject to Natural Hazards

Goal 7 requires local governments to adopt comprehensive plans to reduce risk to people and property from natural hazards.

Findings

The community relies on a safe and functioning transportation system. In the event a natural hazard causes disruption to the system it is important for the City to plan for how it will handle and rebound from such impacts. Under the Economic Development goal in the document is an objective and action item that aims to evaluate vulnerabilities to the transportation system in relationship to natural disaster such as an earthquake. It calls for the City to develop a mitigation strategy using the City's recently adopted Natural Hazards Mitigation Plan to study impacts to major corridors.

Conclusions

Goal 7: Satisfied. The City has an updated Natural Hazards Mitigation Plan (NHMP) that identifies the significant hazards that could disrupt the community. The TSP recognizes the importance of the transportation system and identifies an action item in the Goals and Objectives section (Objective 6, Action Item: 6-a) to assess the resiliency of the system in the event of a natural disaster, specifically a Cascadia event.

Goal 8—Recreation Needs

Goal 8 seeks to satisfy the recreational needs of the citizens of the state and visitors, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.

Findings

The TSP incorporates the shared-use path network identified in the City's Leisure Services Plan. The development and connection of such paths provide for additional recreational opportunities as well as the possibility of transportation connections throughout the community.

Conclusions

Goal 8: Satisfied. The desire to create additional recreational opportunities for the residents and visitors of Medford is re-iterated in the transportation plan through the identification of shared-use paths within the network.

Goal 9—Economic Development

Goal 9 requires local comprehensive plans and policies contribute to a stable and healthy economy in all regions of the state.

Findings

Within the identified Goals and Objectives found in Section 2 of the TSP document, Economic Development is identified as Goal 2. This goal seeks to enhance economic development and vitality within the City and throughout the Region. The noted objectives include: supporting existing and planned land uses, efficiently moving freight, increasing resiliency related to a natural disaster, and supporting tourism and neighborhoods.

The Tier I project list includes a number of key projects distributed throughout the community to support new development, particularly near new Urban Growth Boundary expansion areas and other areas for redevelopment. The Foothill/North Phoenix/South Stage Road corridor is an important City project identified within the plan that supports the City's economic goals but also has regional significance for the City of Phoenix, Jackson County, and ODOT. Four Urban Upgrade projects and a

new roadway project showing the extension of South Stage over Interstate-5 are identified in Tables 5 and 7 of the document. Improvements to intersections particularly in the north and east side of Medford have been identified in Table 8. In many cases, new traffic signals (or roundabouts) are needed at these identified intersections to help maintain the City's Level-of-Service standard and ensure development impacts are mitigated and development is able to proceed supported by needed infrastructure. The TSP also identifies five ODOT intersections that are not projected to meet ODOT's mobility target which will require further study as part of the Interchange Area Management Plan (IAMP) or alternative mobility target study. Improvements and/or alternative mobility targets at these intersections will be critical to allow Medford's economy to continue to develop.

ODOT is currently working on an (IAMP) at the East Vilas Road and Oregon 62 Bypass location. A Technical Advisory Committee for the project reviewed the initial 19 scenarios in July 2018 and recommended the top four performing alternatives be further analyzed. The committee is awaiting adoption of the City's TSP to ensure proposed projects are consistent with Medford's Tier 2 project list. The full list of Oregon 62 Bypass projects under ODOT's jurisdictions are identified in Table 9 of the document. The completion of the Highway 62 Bypass and the transfer of the current Highway 62 to the City will provide additional economic development opportunities for redevelopment along this corridor.

Conclusions

Goal 9: Satisfied. The transportation system plan is aligned with the City's goals for economic development.

Goal 10—Housing

Goal 10 requires local jurisdictions to provide for the housing needs of its citizens and provide for the appropriate type, location and phasing of public facilities and services sufficient to support housing development in areas developed or undergoing development or redevelopment.

Findings

In June, the State acknowledged the City's proposal to expand its Urban Growth Boundary to accommodate future growth. The amount and mix of land planned to be developed and the type of land uses have a direct impact on the how the transportation system will be used in the future. The travel demand model provides base year 2006 and forecast year 2038 traffic volume projections that reflect anticipated land use changes and planned transportation improvements within the study area. It also assumes regional growth and build-out of the City's expansion areas (Volume II, Appendix L – Operations Analysis Memorandum).

As noted in Goal 9 above, the identified Tier I projects will provide system improvements to support new housing development within the City and expansion areas. All of the proposed Urban Upgrade projects include new sidewalk and bicycle facilities that also support development in residential locations.

Conclusions

Goal 10: Satisfied. The development of the TSP was based on modeling future growth to accommodate all land uses including housing. The projects outlined support residential development within the City and Urban Growth Boundary.

Goal 11—Public Facilities and Services

Goal 11 requires cities and counties to plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development. The goal requires that urban and rural development be "guided and supported by types and levels of urban and rural public facilities and services appropriate for, but limited to, the needs and requirements of the urban, urbanizable and rural areas to be served."

Findings

Transportation facilities are identified as Category 'A' facilities in the Comprehensive Plan. Medford's transportation system includes roadways, bicycle facilities, and sidewalks needed to accommodate urban development.

Section 2 of the TSP (Exhibit A) describes existing conditions and future needs within the system; Section 5 identifies projects. The projects are categorized into different project types and have been identified to improve the system and help meet future needs. The City has identified priority projects (Tier 1) to pursue over the planning period that will help facilitate growth. It is recognized however that priorities over time may change and other projects may need to be pursued.

The City is responsible for planning for adequate public facilities to serve the City and the new expansion areas. The adoption of a new transportation system based on this projected growth is necessary to meet the City's obligations to provide and plan for urban infrastructure.

Conclusions

Goal 11: Satisfied. The updated transportation plan outlines the types of infrastructure projects and improvements needed to provide for a growing City.

Goal 12—Transportation

Goal 12 requires cities, counties, metropolitan planning organizations, and ODOT to provide and encourage a "safe, convenient and economic transportation system. Goal 12 is implemented through OAR 660, Division 12, also known as the Transportation Planning Rule ('TPR"). The TPR contains numerous requirements governing transportation planning and project development.

Findings

The proposed Transportation System Plan (TSP) for the City is comprised of two Volumes. Volume 1 is separated into 6 different sections. The *Introduction* and *Goals and Objectives* help provide the framework for the document and outline what the City is trying to accomplish with the plan over the next planning period. The *Goals and Objectives* address topics such as Safety and Public Health, Economic Development, Livability, Connectivity, Financing, and Environment. Section 3 provides the *Existing Conditions and Future Needs Assessment* of the transportation system. Current facilities for all transportation modes were evaluated to identify any deficiencies, and an analysis was conducted to estimate the conditions in the future year 2038 based on future growth and land uses. Applicable transportation and land use projects were incorporated into the analysis to estimate future conditions, identify future issues and potential mitigations. Discussions with the Citizen Advisory Committee, Technical Advisory Committee, Planning Commission, City Council, and the public were held throughout the planning process to assess these conditions and identify priority projects. The technical analysis is provided in Volume II of the document. Key findings for each transportation mode are outlined in the TSP.

The purpose of Goal 12 is to promote coordination of land use and transportation planning. The updated TSP will replace the 2003 plan and will be adopted as the new Transportation Element of the City's Comprehensive Plan. The adoption of these changes is a legislative amendment recommended by the Planning Commission and adopted by the City Council through ordinance. The City will follow up with any relevant Development Code Amendments to ensure consistency between the TSP and development requirements. Section 6 of the TSP outlines key code and policy amendments to be drafted and evaluated.

Oregon Transportation Plan (OTP)

The Oregon Transportation Plan (OTP) is the state's long-range, multimodal transportation plan. The OTP is the overarching policy document for a series of modal and topic plans that together form the state transportation system plan. A local TSP must be consistent with applicable OTP goals and policies. The following demonstrates how the Draft TSP complies with State transportation policy:

Policy 1.1 Development of an Integrated Multimodal System
It is the policy of the State of Oregon to plan and develop a balanced, integrated transportation system with modal choices for the movement of people and goods.

Response

As the region's major urban center, Medford provides a diverse range of modal choices to serve its residents. Section 5 of the TSP addresses the various modes including vehicles, air, freight, transit, bicycles, and pedestrians. The updated plan includes a new cross section for arterial streets that separates the bicycle facilities from the roadway. The creation of new arterial streets and urban upgrades will include this enhancement to help provide safer facilities for those traveling by bicycle while improving roadway conditions for motorists by reducing potential conflicts between motor vehicles, cyclists, and pedestrians.

The plan recognizes the City's responsibility to coordinate with the Metropolitan Planning Organization, other jurisdictions, and agencies to help improve the transportation system within the City and as the system connects throughout the region. Projects are proposed throughout the City to enhance all modes.

Policy 1.2 Equity, Efficiency and Travel Choices
It is the policy of the State of Oregon to promote a transportation system with multiple travel choices that are easy to use, reliable, cost-effective and accessible to all potential users, including the transportation disadvantaged.

Response

Section 5 of the plan identifies the range of cross sections starting with the higher order arterial and collectors and ending with the residential streets. The Functional Classification plan has been updated to identify new higher order streets within the expansion areas and included a review of all existing higher order streets to determine any needed modifications. The City recognizes its built environment has limitations but has set established goals and policies to help aid in providing transportation choices for all its users. For existing higher order streets that may contain missing facilities along existing development, a policy has been created to evaluate how improvements are made to the roadway. For example, streets missing sidewalks will be required to install sidewalk but the planter strip may be reduced in order to work within existing right-of-way constraints. Similarly, for streets missing bicycle facilities, the City will seek alternate routes via other parallel and lower order streets, evaluate a possible lane reconfiguration to add the facilities, or identify specific streets that will require a widened sidewalk to serve as a multi-use path.

All new roadways and urban upgrades will provide facilities for all modes of travel. The City has set aside funding annually for both the installation of sidewalks near neighborhood schools and the infill of bicycle gaps throughout the system. In Section 5, Tables 14 through 19 identify projects for sidewalks, shared-use paths, and bicycle facilities representing over a 100 different projects. Two of the identified actions items within the Goals and Objectives that are supported by the CAC, TAC, Bicycle and Pedestrian Advisory Committee (BPAC), and the public include review of the All Ages and Abilities Bicycle Facilities guidebook produced by NACTO when new bicycle facilities are being considered on the City's roadways. In addition, the City plans to look more closely at bicycle and pedestrian facilities through the development of a separate plan that focuses on these modes.

The City partners with Rogue Valley Transit District (RVTD) who is the provider of transit service throughout the City and region. Figure 22 identifies the major transit routes and stops located within the City. The City's goal to improve connectivity of the system recognizes the importance of coordinating with RVTD to enhance services including links to the airports, downtown, and neighborhoods. RVTD is also in the process of updating its master plan and the City will coordinate any necessary changes to its TSP in the future.

Policy 2.1 - Capacity and Operational Efficiency
It is the policy of the State of Oregon to manage the transportation system to improve its capacity and operational efficiency for the long term benefit of people and goods movement.

Policy 2.2 – Management of Assets
It is the policy of the State of Oregon to manage transportation assets to extend their life and reduce maintenance costs.

Response

The City's updated TSP (Section 3) addresses the existing conditions and future needs of the transportation infrastructure that is critical to the long term benefit of people and the movement of goods. The City has identified needed projects in Section 5 to support the transportation system through the year 2038. These projects include upgrades to signalized intersections to help ensure the City's Level-of-Service standards are met. Such projects are important as development occurs to ensure compliance with the standards and participate in the needed upgrade of these facilities over time.

Polices and regulations that help implement the plan are designed to preserve and maintain the transportation system. This is accomplished by the routine scheduling and overlay of major roadways to ensure their use and function over time. In addition, the City has strategies to improve local access and mobility through access management as discussed in Section 5. The City strives to continue to enforce

spacing standards in accordance with the roadway's jurisdiction and functional classification, require consolidation of driveways over time and as development opportunities present themselves, and provide other transportation improvements such as turn lanes when deemed appropriate. The City relies on the Oregon Highway Plan when roadways are under the jurisdiction of ODOT.

Policy 3.1 – An Integrated and Efficient Freight System

It is the policy of the State of Oregon to promote an integrated, efficient and reliable freight system involving air, barges, pipelines, rail, ships and trucks to provide Oregon a competitive advantage by moving goods faster and more reliably to regional, national and international markets.

Policy 3.3 – Downtowns and Economic Development

It is the policy of the State of Oregon to provide transportation improvements to support downtowns and to coordinate transportation and economic development strategies.

Response

Goal 2 of the TSP is Economic Development. It identifies the City's goals to coordinate efforts to improve the effectiveness and safety of the movement of freight. It also supports the efforts of the Rogue Valley International Airport and its master plan. The strengthening of the City's downtown and surrounding neighborhoods are also an important objective of the plan and the coordination of the transportation system and adjacent land uses.

The freight routes in the City are shown in Figure 3, Section 3 along with Jackson County, ODOT's, and the National Highway System's freight routes and connections. The City's roadway design standards help ensure the roadways are built to support freight traffic. Table 20 of the plan identifies the freight improvement needs and street projects identified in the Rogue Valley Metropolitan Planning Organization Freight Study.

Policy 4.1 - Environmentally Responsible Transportation System

It is the policy of the State of Oregon to provide a transportation system that is environmentally responsible and encourages conservation and protection of natural resources.

Response

The ability to provide residents and visitors with transportation options (the ability to easily and safely walk, bike or use transit) helps provide the greatest benefits for reducing the use of vehicles and helping to reduce environmental impacts by reducing energy consumption and improving air quality.

The transportation plan identifies projects to improve and expand the sidewalk network and installation of bicycle facilities or shared-use paths throughout the community. One major project identified is the completion of the Larson Creek Greenway corridor in southeast Medford. This part of the City is anticipated to grow and this greenway corridor will provide new opportunities for residents to choose alternative modes of transportation.

RVTD provides nine transit routes to serve all four wards of the community. After RVTD's master plan is updated, the City will support implementation of this plan as much as possible.

The City will continue to coordinate land use and transportation planning by evaluating neighborhood plans (Liberty Park, downtown) or transit oriented districts (TOD). These plans help integrate residential and employment land uses and provide opportunities to shorten and reduce the number of trips by supporting the use of other transportation options.

Policy 5.1 – Safety
It is the policy of the State of Oregon to continually improve the safety and security of all modes and transportation facilities for system users including operators, passengers, pedestrians, recipients of goods and services, and property owners.

Response

Safety is addressed in Section 5 of the transportation plan with technical data provided in Volume II, Appendix B (Safety & Technical Memorandum). Table 13 identifies the top 20 safety locations, the overlap with other indicators as shown in ODOT's Statewide Priority Index System (SPIS) and All Roads Transportation Safety (ARTS) lists, and their correspondence to identified projects in the plan.

The safety memorandum explains the safety analysis conducted for the City and groups the topic into two sections: crash trends overview and network screening. The crash trends overview section provides a summary of the data used for the analysis and general trends seen throughout the City. The network screening process evaluated all the roads and intersections within the City. Crash data was obtained from ODOT for the years between 2011 and 2015.

The TSP also provides an analysis of the transportation facilities using the Bicycle and Pedestrian Levels of Stress methodologies. Figure 13 identifies the types of improvements needed to create low stress bicycle connections. Figure 14 shows existing pedestrian facilities, Figure 15 shows the existing levels of pedestrian stress experienced on pedestrian facilities. Annual funding is identified in the project list to provide for sidewalk and bicycle improvements throughout the City. Other projects

identified such as urban upgrades will accommodate all modes of travel and help improve safety along the City's streets and these improvements are considered in Section 5 under the Legacy Streets topic.

Policy 7.1 – A Coordinated Transportation System

It is the policy of the State of Oregon to work collaboratively with other jurisdictions and agencies with the objective of removing barriers so the transportation system can function as one system.

Response

The City has coordinated this plan with adjacent jurisdictions including the City of Phoenix and City of Central Point, Jackson County, the Rogue Valley Metropolitan Planning Organization, and ODOT. These agencies were represented on the Technical Advisory Committee as outlined under Goal 2 above.

Policy 7.3 – Public Involvement and Consultation

It is the policy of the State of Oregon to involve Oregonians to the fullest practical extent in transportation planning and implementation in order to deliver a transportation system that meets the diverse needs of the state.

Policy 7.4 – Environmental Justice

It is the policy of the State of Oregon to provide all Oregonians, regardless of race, culture or income, equal access to transportation decision-making so all Oregonians may fairly share in benefits and burdens and enjoy the same degree of protection from disproportionate adverse impacts.

Response

The plan included a robust public involvement process that is summarized in the introduction of the document in Section 1 and as detailed under the Goal 1 Statewide Planning Goals findings noted above. The City provided information via its webpage (MedfordTSP.com) and conducted two on-line forums that included a community survey. Additional public feedback will be provided during the public hearing process.

Oregon Highway Plan

The 1999 Oregon Highway Plan (OHP) establishes policies and investment strategies for Oregon's state highway system over a 20-year period and refines the goals and policies found in the OTP. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local

road, bicycle, pedestrian, transit, rail, and air systems. Medford's updated TSP meets the State policies as follows:

Policy 1A: State Highway Classification System
It is the policy of the State of Oregon to develop and apply the state highway classification system to guide ODOT priorities for system investment and management.

Policy 1C: State Highway Freight System
This policy balances the need for movement of goods with other uses of the highway system, and to recognize the important of maintaining efficient through movement on major truck freight routes.

Response

The City has a number of state facilities within its boundaries including Interstate 5 (I-5), Crater Lake Highway (Statewide Highway), Highway 99 and Rossanley Drive (District Highways), and the new OR 62 Bypass categorized as a Principal Arterial Other. The Functional Classification of these roadways establishes their primary function and their access management regulations. The City's driveway and traffic spacing standards vary from those of ODOT. Discussion regarding access management is found in Section 5 of the plan. The City coordinates with ODOT on access spacing standards based on OAR 734-051-3050 and the Oregon Highway Plan.

Policy 1B: Land Use and Transportation
This policy recognizes the role of both State and local governments related to the state highway system.

Response

As outlined in Goals 1 and 2 of this report, and OTP Policy 7.1 above, the development of the TSP has been a collaboration between the City, ODOT, and other stakeholders. The plan recognizes the relationship between integrating land use and transportation facilities especially near designated activity centers and TODs. The City is a participant in the Rogue Valley Metropolitan Planning Organization and is helping to achieve the alternative measures outlined in the Regional Transportation Plan (RTP). The concentration of land use and transportation improvements near activity centers will help in achieving the RTP requirements.

Policy 1F: Highway Mobility Policy
This policy seeks to maintain acceptable and reliable levels of mobility on the state highway system, consistent with the expectations for each facility type, location and functional objectives.

Response

The plan summarizes the existing and projected (2038) traffic conditions analysis for streets and intersections in Section 3 and in detail in Volume II, Operations Analysis memorandum. Figure 4 shows the existing intersection Level-of-Service (LOS) and Figure 5 shows the future baseline intersection Level-of-Service. Intersections not projected to meet the City's or ODOT's mobility targets were evaluated to identify potential improvements such as modifications to signal timing or signal phasing, adding turn lanes or through lanes, or installing a signal. There are five identified ODOT intersections that need further evaluation as part of the Interchange Area Management Plans (IAMPs) or alternative mobility targets. The City is participating in the IAMP process and will cooperate with ODOT to implement plans that are consistent with highway mobility standards.

Policy 1G: Major Improvements and Policy 2B: Off-System Improvements

This policy seeks to maintain highway performance and improve safety by improving system efficiency and management before adding capacity. ODOT works in partnership with local governments to address highway performance and safety needs.

It is the State policy to provide state financial assistance to local jurisdictions to develop, enhance, and maintain improvements on local transportation systems when they are a cost-effective way to improve the operation of the state highway system such as through local jurisdictions adopting land use, access management and other policies to assure the continued benefit of the off-system improvement to the state highway system.

Response

The TSP outlines needed projects to accommodate future growth in the following categories: additional vehicle capacity, new roadway connections, pedestrian and bicycle travel, and safety. The projects are identified in Section 5 of the plan and includes a commitment to improve the Foothill/North Phoenix/South Stage corridor. In the same section, access management standards are addressed for access, spacing, driveway access, and access consolidation. These identified strategies in the plan are intending to help preserve the transportation system investments while promoting safety and limiting congestion.

Policy 1H: Bypasses and Policy 2C: Interjurisdictional Transfers

It is State policy to build bypasses to provide safe, efficient passage for through travelers and commerce, and to effectively serve state and regional traffic trips.

It is State policy to consider, in cooperation with local jurisdictions, interjurisdictional transfers to lead to increased efficiencies in the operation and maintenance of a particular roadway segment or corridor.

Response

The construction of Phase 1 of the OR 62 Bypass project is underway in Medford. The project will result in a new four-lane access controlled expressway from Interstate 5 to OR 62 north of White City. The current phase starts at OR 62 east of Bullock Road and Poplar Drive and extends north on the west side of OR 62 to Corey Road. An IAMP is also under review for the Vilas Road and OR 62 Bypass.

The Bypass is expected to reduce traffic volumes on the old Highway 62 providing opportunities to review access management, streetscape enhancements, pedestrian crossing treatments, multi-modal improvements, and transit needs. The City of Medford will eventually take jurisdiction of segments of the old Highway 62.

Policy 2F: Traffic Safety

It is State policy to continually improve safety for all users of the highway system.

Response

See response under OTP Policy 5.1.

Policy 3A: Classification and Spacing Standards

It is State policy to manage the location, spacing and type of road and street intersections and approach roads on state highways to assure safe and efficient operation of state highways.

Response

Access management is covered in Section 5 of the plan and outlines the City's and ODOT's spacing standards for accesses, driveways, and traffic signals. These standards are coordinated through regulations found in Chapter 10 of the Medford Municipal Code.

Policy 4A: Efficiency of Freight Movement

It is State policy to maintain and improve the efficiency of freight movement on the state highway system and access to intermodal connections. The State shall seek to balance the needs of long distance and through freight movements with local transportation needs on highway facilities in both urban areas and rural communities.

Response

The freight routes shown in Figure 3 identify those for the City, County, ODOT, and the National Highway System. Several of the City's Tier 1 projects (Figure 19) that also include intersection projects are proposed on designated freight routes including the Foothill/North Phoenix corridor, Table Rock Road, and W. McAndrews Road.

Policy 4B: Alternative Passenger Modes

It is State policy to advance and support alternative passenger transportation systems where travel demand, land use, and other factors indicate the potential for successful and effective development of alternative passenger modes.

Response

Section 5 of the updated TSP includes a Pedestrian plan that outlines sidewalk, bicycle, and shared-use path projects to help address gaps in the system and ensure a better connected network to serve all users. A new cross section that is the preferred alternative when new roads are built provides for the separation of bicycle facilities off of the roadway. Separated facilities better serve the needs of all ages and abilities. Sidewalk infill has been prioritized near neighborhood schools with annual funding proposed at $250,000.

Rogue Valley Transit District provides nine fixed-routes throughout the City that provides options for the traveling public. The City will support RVTD and the implementation of their updated master plan as much as possible.

The plan outlines different strategies through Transportation System Management and Transportation Demand Management to maximize the existing system by trying to incentivize different forms of travel through carpooling or encouraging mixed-use developments.

Other Modal Plans

The State has a number of modal and topic plans that together form the State TSP. In addition to the OHP, which is the modal plan for the State's roadways, the following govern aspects of statewide planning for the transportation system: Oregon Transportation Safety Action Plan; Oregon Bicycle and Pedestrian Plan/ Bicycle and Pedestrian Design Guide; Oregon Public Transportation Plan; Oregon Freight Plan; Oregon State Rail Plan; and Oregon Aviation Plan.

Response

Section 5 of the Transportation System Plan outlines the modal plans that are including in the document. These plans include: Street Plan, Safety Plan, Transit Plan, Freight/Rail/Intermodal Plan, and Water, Air, and Pipeline Plans. All of these plans were developed to be consistent with State modal plans and ensure the City's plan meets relevant State policies and requirements.

OAR 660 Division 12 Transportation Planning Rule (TPR)

The purpose of the Transportation Planning Rule (TPR) is "to implement Statewide Planning Goal 12 (Transportation) and promote the development of safe, convenient and economic transportation systems that are designed to reduce reliance on the automobile so that the air pollution, traffic and other livability problems faced by urban areas in other parts of the country might be avoided." A major purpose of the TPR is to promote more careful coordination of land use and transportation planning, to ensure that planned land uses are supported by and consistent with planned transportation facilities and improvements.

OAR 660 Division 12 Transportation Planning Rule (TPR)

The TPR contain policies for preparing and implementing a transportation system plan.

Response

660-012 Administrative Rule Section Number(s)	Administrative Rule Provision	City's Response based on updated TSP
-0015	Preparation and Coordination of Transportation System Plans	The City has coordinated the TSP update with affected State, local governments, the school district, the RVMPO, and other affected agencies through the Technical Advisory Committee and Citizen Advisory Committee
-0016	Coordination with Federally-Required Regional Transportation Plans in Metropolitan Areas	The City has coordinated with the RVMPO regarding the plan and will provide needed updates to the Regional Transportation Plan once adopted. The City recognizes its commitment to participate in striving to achieve the alternative measures identified in the Regional Transportation Plan.
-0020	Elements of Transportation System Plans	The plan has studied existing and future conditions to meet the transportation needs of Medford in 2038. The Functional Classification Plan has been updated to show new higher order streets within the Urban Growth Boundary expansion areas and make updates as necessary to existing streets. The plan includes the extension of streets to make better connections. The plan addresses all modes of travel including roads, pedestrians, bicycles, shared-use paths, air, freight, rail, transit and pipeline.

-0025	Complying with the Goals in Preparing Transportation System Plans; Refinement Plans	The adoption of a new TSP is a legislative decision. The information within this report addresses the applicable criteria associated with a Major Comprehensive Plan amendment and compliance with the Statewide Planning Goals, the Oregon Transportation Plan, Oregon Highway Plan, other Modal Plans, and the applicable administrative rules.
-0030	Determination of Transportation Needs	The plan is based on adopted population and employment forecasts for Medford. The planning period for the TSP is from 2018-2038. The plan includes improvements to enhance the multi-modal system and provide transportation options for all users. The City will assist in reducing reliance on the automobile by coordinating future land use and transportation facilities and by participating in the alternative measures outlined in the Regional Transportation Plan.
-0035	Evaluation and Selection of Transportation System Alternatives	See -0030 above; The plan includes projects to assist in expanding the system and providing transportation alternatives for its residents.
-0040	Transportation Financing Program	The plan includes an estimate of anticipated revenues over the planning period. Projects are prioritized into Tier 1 (funded) and Tier 2 (unfunded) projects. The Tier 1 projects are categorized in two, five-year timeframes and a ten-year timeframe. An estimated cost is provided for each of the identified City projects.
-0045	Implementation of the Transportation System Plan	Code amendments related to implementation of the TSP are found in Section 6 of the document and will follow adoption of the plan.
-0050	Transportation Project Development	The plan includes ODOT projects. The Regional Transportation Plan will be updated after adoption of the plan.

Conclusions

Goal 12: Satisfied. As outlined above, the City's TSP is found to be in compliance with the Oregon Transportation Plan, Oregon Highway Plan, Other Modal Plans, and the applicable administrative rules that govern Goal 12. Code amendments that assist with implementing the TSP are outlined in Section 6 of the document and will follow upon adoption of the plan.

Goal 13—Energy Conservation
Goal 13 seeks to conserve energy

Findings

As noted in other goals above, there is a strong connection between existing and future land uses and transportation facilities. Creating land use patterns and connected transportation systems provides more efficient use of land and helps to reduce energy consumption by providing for shorter commutes, more direct routes or the use of alternative modes of travel.

Development within the expansion areas must show compliance with the performance measures of the Regional Plan. These measures require minimum residential densities, transportation connections, and integrated development patterns to serve the residents. Provisions such as these help achieve greater energy efficiency throughout the community.

Section 5 of the document also discusses Transportation Demand Management and Transportation System Management strategies that address ways to try and shift travel habits and find ways to improve the system without increasing travel lanes or building new roads. These identified strategies also lead to more energy conservation.

Conclusions

Goal 13: Satisfied. The transportation plan identifies areas such as activity centers that provide opportunities for more mixed-use, concentrated development patterns that help create more efficiencies. The new expansion areas and increased transportation connections will also conserve energy.

Goal 14—Urbanization
Goal 14 requires the orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities.

Findings

The update to the Transportation System Plan is directly related to the City's expansion of its Urban Growth Boundary and to provide for the transition from rural lands to urban lands. Provisions outlined in the Regional Plan help to ensure these new lands are served by adequate public facilities and developed in a manner that makes efficient use of land. An evaluation of the transportation impacts and needs to serve these new areas is necessary and appropriate in order to ensure a smooth transition of these lands. The City spent several years modeling transportation impacts taking into consideration the future development of rural lands to urban lands.

Conclusions

Goal 14: Satisfied. Provisions are in place to ensure coordination between transportation facilities and the transition of lands from rural to urban uses.

Goals 15–19 do not apply to this part of the State.

Comprehensive Plan, Review and Amendments chapter: Amendments [to Implementation Strategies] shall be based on the following [criteria 1–6]:

1. *A significant change in one or more Goal or Policy.*

Findings

The updated plan includes a new set of goals, objectives, and action items to provide guidance on how to implement the transportation plan for a growing community. The plan begins with a vision statement to maintain and improve the transportation system to serve all people. The plan identifies six overall goals, 21 objectives, and 82 action items to help guide staff and the community to continue building and improving the City's transportation system. The main themes of the goals, objectives, and action items cover the following topics: Safety and Public Health, Economic Development, Livability, Connectivity, Financing, and Environment.

The new Transportation System Plan will guide changes to the City's infrastructure and operations over the 20-year planning period. The goals, objectives, and action identify and summarize the vision of the plan and provide ways to implement it. Staff will be responsible for updating the Planning Commission and City Council regularly on the progress towards the goals and objectives.

Conclusions

Criterion 1: Satisfied. The plan outlines the City's new goals, objectives, and action items needed to implement the transportation plan. This element of the plan was developed based on input from the Joint Transportation Subcommittee/Citizen

Advisory Committee, the Planning Commission, public input, and then refined by the members of the City Council. The provisions assist in meeting the City's vision related to transportation.

2. *Availability of new and better strategies such as may result from technological or economic changes.*

Findings

The development of the City's transportation system is highly dynamic. The maintenance, improvement, and construction of transportation infrastructure is a collaborative effort among City, County, State, and Federal agencies as well as private and public entities. The plan anticipates new population growth over the planning period. Serving current and future residents and visitors will require new and enhanced transportation facilities. The City has identified its financial ability to construct priority projects over the next two decades and recognizes other forms of funding and assistance will be needed through grants, financial support from other jurisdictions and agencies, and public-private partnerships to help build out the system over time.

Advancements in transportation are occurring rapidly through the use of more fuel efficient vehicles, traffic signal technology, and the research and testing of autonomous vehicles. The city is the major urban center in the region and will grow and change over time as new development occurs. The plan takes into consideration these factors and will serve the community as conditions change in the transportation landscape.

Conclusions

Criterion 2: Satisfied. The plan is a blue print to help ensure the transportation system for the City is maintained and improved over time. There is an overabundance of projects that the City cannot fully fund, but through prioritization and seeking out other sources of funding and opportunities, the transportation system will be enhanced to effectively serve its residents.

3. *Demonstrable ineffectiveness of present strategy(s).*

Findings

The Transportation System Plan was adopted in 2003. The City has grown and changed over the past 15 years and is preparing to serve approximately 20,000 more people in the next two decades. In order to plan for this growth, the transportation needs of the community need to be evaluated and planned for. There is no finding that the present strategy is ineffective, but growing demands of existing facilities

require routine evaluation and, where necessary, improvement, expansion, or augmentation.

Conclusions

Criterion 3: Satisfied. The existing transportation plan was effectively used over the last 15 years to serve the community. Future growth necessitates an update to the plan to enhance the transportation system and prioritize needed projects.

4. *Statutory changes affecting the Plan.*

Findings

This same criterion has been addressed in Criterion 5 above. No statutory changes are found to effect the new transportation plan.

Conclusions

Criterion 4: Satisfied. Detailed responses are provided in Criterion 5 above. The proposal complies with existing administrative rules that govern such plans.

5. *Demonstrable budgetary constraints in association with at least one of the above criteria.*

Findings

The City has estimated its projected revenues and expenditures for the next 20 years. The plan shows there is approximately $88.4 million dollars available for capital projects. See Criterion 2 above (*Information reflecting new or previously undisclosed public need)* for more details on the proposed funding.

Based on estimated revenues, the City has prioritized projects into Tier 1 and Tier 2 lists. Tier 1 projects are those with funding allocated to them, while Tier 2 projects are unfunded. The needed projects are categorized into different project types including:

- Urban Upgrades
- Roadway Widening
- New Roadways
- Intersection Improvements
- Sidewalk
- Shared Use Paths, and
- Neighborhood Bikeways and Bicycle Facilities

The estimated capital revenues have been allocated to projects in all the categories above. The projects selected will help maintain the City's Level-of-Service standard "D" (with two intersections at Level-of-Service "E") at specified intersections and set

aside funds towards the Foothill/North Phoenix/South Stage corridor. The selected projects provide a diverse mix of opportunities to upgrade existing streets, complete trail segments along Larson Creek, and extend new roadways.

The selected projects will be reviewed through the biennial budget process and assigned through a five-year capital improvement plan. Depending on priorities, community needs, and grant funding, projects can be shifted to different timeframes for completion.

Conclusions

Criterion 5: Satisfied. The City has more projects than can reasonably be funded over the planning period. Therefore, all applicable projects have been prioritized into Tier 1 and Tier 2 lists with funding allocated to Tier 1 projects. The transportation needs of the community may change over time, but identified projects have been selected to maintain city standards and improve transportation facilities to serve the residents of the City.

6. *All applicable Statewide Planning Goals.*

Findings

The Statewide Planning Goals identified as relevant to the Transportation System Plan have been addressed in detail in Criterion 6 above.

Conclusions

Criterion 6: Satisfied. The updated Transportation System Plan is compliant with the applicable Statewide Planning Goals.

RECOMMENDED ACTION

The Planning Commission recommends adopting the proposed amendments based on the analyses, findings, and conclusions in the Council Report dated October 25, 2018, including Exhibits A through P.

EXHIBITS

A Transportation System Plan (replaces the existing Transportation Element)
B Public Facilities Element
C Conclusions, Goals, and Policies Element
D City Council Memorandum dated August 2, 2018 with attachments
E Memorandum dated May 14, 2018 from the Bicycle and Pedestrian Advisory Committee (BPAC)
F Citizen e-mails supporting All Ages and Abilities Bicycle Facilities (consolidated)

G E-mail from Gary Shaff received 10/9/2018 that includes written testimony from Siskiyou Velo bike club and a copy of Designing for All Ages and Abilities Guidance for bicycle facilities
H E-mail from Dan Thorndike received October 10, 2018
I E-mail from Gary Shaff including testimony labeled 233 Days Until 2019 Fire Season, a report titled A Global High Shift Cycling Scenario, and Transport Reviews
J Testimony submitted by Evan MacKenzie
K Pamphlet titled Make Medford Safe for Biking by All Ages and Abilities
L Planning Commission hearing minutes of October 11, 2018 (excerpt)
M Planning staff power point presentation to Planning Commission
N Memorandum from the Legal Department
O E-mail and attachments from Raul Woerner regarding local street connectivity
P Memorandum from the Planning Department responding to Siskiyou Velo's written testimony in Exhibit G

CITY COUNCIL AGENDA: NOVEMBER 1, 2018

EXHIBIT A

Comprehensive Plan
Transportation System Plan Element

The Transportation System Plan Element is being replaced by the updated 2018–2038 Transportation System Plan.

The 2018–2038 Transportation System Plan contains the following documents:

Volume I (Main Document)
Attachment A: Bicycle and Pedestrian Toolkit
Attachment B: North Medford Circulation Plan
Attachment C: SW Medford Circulation Plan
Attachment D: SE Medford Circulation Plan

Volume II (Appendix)
Appendix A – Plans and Policies Review
Appendix B – Medford Safety Memorandum with attachments
Appendix C – Base Year Volumes
Appendix D – Base Year Conditions Synchro Outputs
Appendix E – RVMPO Travel Demand Model Outputs_final
Appendix F – Future Volume Post-Post Processing Worksheet
Appendix G – 2038 Future Baseline Conditions Figures and Synchro Outputs
Appendix H – 2038 Future Mitigated Conditions Figures and Synchro Outputs
Appendix J – TPR Checklist
Appendix K – Functional Class _2018-01-17
Appendix L – Operations Analysis

The above documents can be found under Important Documents on the webpage at the following link:
http://www.ci.medford.or.us/Page.asp?NavID=4168

EXHIBIT B

Comprehensive Plan
Public Facilities Element Excerpt

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1. I. INTRODUCTION

The fundamental purpose of the Public Facilities Element is to establish and maintain a general but timely view of where, when, and how public facilities and services will be provided to support planned urban growth within Medford's Urban Growth Boundary. Each year, decisions are made to commit considerable funds for acquisition, construction, expansion, and repair of public facility systems. One important role of this *Comprehensive Plan* element is to describe the principles and criteria underlying these decisions and to integrate them with the overall land use planning process.

Public facilities elements are required by state law (ORS 1197.175 and OAR 660-011) for all cities with a population greater than 2,500. The Public Facilities Element implements Statewide Planning Goal 11, which is intended to assure that cities plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban development. This element was written in accordance with Oregon Administrative Rules (OAR) 660-011 (Public Facilities Planning).

1.1. *Public Facilities Categories*

Public facilities and services are divided into two categories.

Category "A" includes:

- Water Service
- Sanitary Sewer and Treatment
- Storm Drainage
- Transportation Facilities~~*~~

~~*Transportation will be temporarily covered in this element until adoption of the new Transportation Element when Medford's Transportation System Plan (TSP) is completed.~~

These are the key minimum physical facilities necessary for urban development and are those for which specific documentation is required by state rule.

Category "B" include:

- Fire Protection
- Law Enforcement
- Parks and Recreation
- Solid Waste Management
- Schools
- Health Services

Category "B" public facilities and services enhance and protect development within the city and are provided in response to development that occurs. Because of this they will generally be discussed in less intensive detail than Category "A" facilities. The division of public facilities into these two categories is useful when determining facility adequacy prior to development. Creation of these two categories complies with OAR 660-011. This document identifies Category "A" facilities and the improvements to city infrastructure and services that are necessary to support land uses allowed by the *Comprehensive Plan*. Because this plan element also describes potential funding mechanisms, the plan is essential to long range financial planning of capital facilities, and provides general guidance for the cost and location of future facilities.

EXHIBIT C

Comprehensive Plan
Conclusions, Goals, Policies Element Excerpt
Deleted text is ~~struck-through~~; Added text is underlined

TRANSPORTATION SYSTEM PLAN ELEMENT

Adopted 11/20/03 by Ord. 2003-299; Amd 12/16/04 by Ord. 2004-258; Amd 10/1/08 by Ord. 2008-206

TRANSPORTATION – CONCLUSIONS

- Medford has an extensive roadway network improved, operated, and maintained by the State, County, and City. Coordination among these entities is vital to ensure the roads meet the needs of the public through the new planning period (2018-2038).

- The Functional Classification plan identifies the existing and proposed higher order street network needed to ensure the efficient movement of local and regional traffic within and through its boundaries.

- The City maintains a Level-of-Service (LOS) "D" standard for signalized intersections through the planning period and a LOS "E" standard for two intersections located near the South Medford Interchange. In addition, the City recognizes ODOT's mobility standards (calculated as a volume-to-capacity ratio) within the community and the requirement to meet or modify these standards through alternative standards.

- Activity Centers and Transit Oriented Districts are mixed land use destinations that support multi-modal transportation and help the City and region try to achieve the benchmarks identified in the regional transportation plan related to alternative measures.

- The City recognizes its responsibility to improve safety and mobility for the traveling public through intersection improvements, installing sidewalk and bicycle facilities, and compliance with Americans with Disability Act (ADA) standards and requirements.

- The Rogue Valley Transit District (RVTD) is the primary operator of public transportation service in Medford and the County. The citizens of Medford benefit from the fixed routes that bisect the City.

- Medford's transportation system encompasses more than roadways and relies upon other methods of transport including air, rail, freight, and pipeline to serve its residents and

visitors.

- Funding is limited to meet the transportation needs for the entire community, but the City has identified a list of priority projects to maintain and grow the system over time. The plan is flexible to allow for projects to be modified as needed.

- The City has adopted a range of cross sections for the arterial and collector streets which includes an option for separated off-street bicycle facilities.

- It is difficult to retrofit existing street facilities. The City outlines a system to address such "legacy streets" in order to upgrade existing streets over time and ensure the various modes of transportation are constructed.

- The use of Transportation Demand Management and Transportation System Management strategies provide ways to improve the efficiency and operations of the City's transportation system.

- The implementation of the Transportation System Plan will be coordinated through code amendments and other adopted plans, refinement of neighborhood and Transit Oriented Development plans, and Urbanization Plans.

~~**TRANSIT ORIENTED DISTRICT—CONCLUSIONS**~~

- ~~Each TOD area has unique opportunities and issues and designing a one-size fits all TOD overlay is not likely to be effective.~~

- ~~The Southeast TOD could focus on housing to attract buyers interested in a different sort of housing market.~~

- ~~The Central City TOD already contains the type of development that the other TOD areas are trying to achieve and the strategy for this TOD area should focus on the strength of the existing development while creating new housing opportunities to draw more people to the area.~~

OVERALL TRANSPORTATION SYSTEM—GOALS, ~~POLICIES~~OBJECTIVES, AND ~~IMPLEMENTATION MEASURES~~ACTION ITEMS

~~***GOAL 1: To provide a multi-modal transportation system for the Medford planning area that supports the safe, efficient, and accessible movement of all people and goods, and recognizes the area's role as the financial, medical, tourism, and business hub of Southern Oregon and Northern California.***~~

~~**Policy 1-A:** The City of Medford shall manage projected travel demand consistent with community, land use, environmental, economic and livability goals.~~

Implementation 1-A(1): Utilize the projections in the *Regional Transportation Plan* (RTP) regarding projected travel demand over the 20-year planning period in managing the transportation system.

Implementation 1-A(2): Utilize the *Medford Comprehensive Plan*, including the land use plan covering the 20-year planning period, in managing transportation system.

Implementation 1-A(3): Design and improve arterial streets so that the minimum overall performance during peak travel periods meets Level of Service "D."

Implementation 1-A(4): Consider revisions to the City's concurrency ordinance to manage development-related traffic impacts consistent with other community goals.

Policy 1-B: The City of Medford shall use the *Transportation System Plan* as the legal basis and policy foundation for decisions involving transportation issues.

Implementation 1-B(1): Utilize the *Medford Transportation System Plan* to identify the measures and programs to be undertaken to increase mobility for all travel modes, including implementing standards and ordinances, and design standards and construction specifications for capital construction projects that are consistent with the Plan.

Implementation 1-B(2): Update the *Medford Transportation System Plan* as necessary to remain consistent with regional and statewide plans and laws.

Implementation 1-B(3): Coordinate transportation planning and construction with appropriate agencies.

Implementation 1-B(4): Adopt the *Regional Transportation Plan* (RTP) by reference in the *Medford Comprehensive Plan* to the extent that this Plan is consistent with the *Medford Transportation System Plan*. Where inconsistencies exist, the City shall work cooperatively with the Rogue Valley Metropolitan Planning Organization (RVMPO) to resolve differences.

Implementation 1-B(5): Require *Comprehensive Plan*, *Land Development Code*, and Zoning Map amendments to contain findings that show how the action is in conformity with the adopted tenets of the *Medford Transportation System Plan*.

Implementation 1-B(6): Include projects and programs adopted in the *Medford Transportation System Plan* that are of regional or statewide significance, or that require the use of state or federal funding, within the Regional Transportation Improvement Program and State Transportation Improvement Program.

OVERALL TRANSPORTATION SYSTEM – FUNDING – GOALS,

~~POLICIES, AND IMPLEMENTATION MEASURES~~

~~**Policy 1-C:** The City of Medford's top priority for the use of transportation funds shall be to address the maintenance, operational, and safety needs of the transportation system.~~

> ~~**Implementation 1-C(1):** Utilize a street utility fee as the primary funding source for street system operations and maintenance activities and utilize state highway fuel tax funds to meet the financial requirements of the street operations and maintenance program.~~
>
> ~~**Implementation 1-C(2):** Participate in cooperative agreements with state and local jurisdictions for maintenance and operations activities, based on equitable determinations of responsibility and benefit.~~
>
> ~~**Implementation 1-C(3):** Pursue federal, state, and private grants to augment operations and construction.~~

~~**Policy 1-D:** The City of Medford's second priority for the use of transportation funds shall be to maximize efficient use of the existing transportation system through use of Transportation System Management (TSM) and Transportation Demand Management (TDM) measures prior to expending transportation funds on capacity improvements.~~

> ~~**Implementation 1-D(1):** Utilize transportation demand management measures as the first choice for accommodating travel demand and relieving congestion in a travel corridor, before street widening projects are undertaken.~~

~~**Policy 1-E:** The City of Medford's third priority for the use of transportation funds shall be to fund capital improvements that add capacity to the transportation system. These improvements shall be prioritized based on availability of funds, reducing reliance on the automobile, improving safety, relieving congestion, responding to growth, and system-wide benefits.~~

> ~~**Implementation 1-E(1):** Give priority to funding projects that most increase capacity and relieve congestion, such as intersection improvements as opposed to general street widening, consistent with the adopted level of service (LOS) standards.~~
>
> ~~**Implementation 1-E(2):** Require new development to mitigate its impacts on the transportation system through on-site system improvements consistent with the TSP required as conditions of approval. Also require off-site improvements consistent with the TSP when they can be found to be proportional to the impacts on the transportation system ("Dolan finding").~~
>
> ~~**Implementation 1-E(3):** Collect transportation system development charges (SDC's), as defined by *Oregon Revised Statutes* and local ordinances, to mitigate impacts of new development on area-wide transportation facilities in the Medford planning area.~~
>
> ~~**Implementation 1-E(4):** Utilize the projects and needs identified in the *Medford Transportation System Plan* as the basis for selecting and prioritizing transportation~~

~~improvement projects in the Capital Improvement Program and into regional and state transportation improvement programs, consistent with the adopted goals and policies of the *Medford Comprehensive Plan.*~~

~~**Implementation 1-E(5):** Seek federal funding for capital improvements through participation in the Rogue Valley Metropolitan Planning Organization (RVMPO) or other designated distribution process as provided in federal transportation legislation.~~

~~**Implementation 1-E(6):** Utilize the sale of bonds as a means to finance capital improvements to the transportation system. Select such projects through authorization by the City Council or a vote of the citizens of the City.~~

~~**Implementation 1-E(7):** Investigate establishing a trust fund account for acquisition of property for future right-of-way opportunities~~

~~STREET SYSTEM – GOALS, POLICIES, AND IMPLEMENTATION MEASURES~~

~~***GOAL 2: To provide a comprehensive street system that serves the mobility and multi-modal transportation needs of the Medford planning area.***~~

~~STREET SYSTEM – CLASSIFICATION – GOALS, POLICIES, AND IMPLEMENTATION MEASURES~~

~~**Policy 2-A:** The City of Medford shall classify streets so as to provide an optimal balance between mobility and accessibility for all transportation modes consistent with street function.~~

~~**Implementation 2-A(1):** Utilize the Medford Street Functional Classification Plan Map of the *Medford Transportation System Plan* to identify land for public rights-of-way and to give advance notice to property owners and citizens regarding future expansions of the street system.~~

~~**Implementation 2-A(2):** Provide a grid network of higher order (i.e., Arterial and Collector) streets that link the central core and major industrial areas with major highways and that connect with each other and the lower order street system.~~

~~**Implementation 2-A(3):** Provide a grid network of interconnected lower order (local) streets that disperses traffic and supplies connections to higher order streets, employment centers, and neighborhood activity centers, and provides appropriate emergency access.~~

~~**Implementation 2-A(4):** Develop and adopt conceptual Neighborhood Circulation Plans as stand alone plans or as part of neighborhood or area plans to be implemented as development of these areas occurs. Such Plans shall indicate the function of proposed streets and design standards needed to minimize disruption of existing neighborhoods while assuring adequate access commensurate with the intensity of planned new development and redevelopment. Such plans shall also identify key neighborhood~~

destinations and an interconnected system of bicycle and pedestrian facilities to serve these destinations, as well as to connect with areas outside of the neighborhood.

Implementation 2-A(5): Develop a system of Collector and local residential streets that have adequate capacity to accommodate planned land uses, but preserve the quiet, privacy, and safety of neighborhood living by staying within their capacity.

Policy 2-B: When classifying streets, the City of Medford shall consider impacts to neighborhood livability. Prior to upgrading a street classification in a residential area to a higher order classification, the City shall consider alternatives that would preserve the livability of the affected residential neighborhood, and, if reclassification proceeds, shall consider mitigation measures.

Implementation 2-B(1): Apply the following measures to mitigate noise, aesthetic, and safety impacts when streets that are adjacent to or bisect residential areas are reclassified and constructed to Collector or Arterial street standards: (a) Connect affected residential areas to other areas of the community with safe and efficient bicycle and pedestrian improvements; and (b) Consider mitigation measures to physically buffer the affected residential areas from traffic noise. These may include installation of major landscape/streetscape components such as landscaped buffers, walls or fencing, tree plantings, and the creation of open spaces.

STREET SYSTEM – DESIGN – GOALS, POLICIES, AND IMPLEMENTATION MEASURES

Policy 2-C: The City of Medford shall design the street system to safely and efficiently accommodate multiple travel modes within public rights-of-way.

Implementation 2-C(1): Apply the street design standard that most safely and efficiently provides multi-modal capacity respective to the functional classification of the street, mitigating noise, energy consumption, neighborhood disruption, economic losses, and other social, environmental, or institutional disruptions. Use of adopted neighborhood plans should determine the specific look and character of each neighborhood and its street system.

Implementation 2-C(2): Limit Major Arterial streets to a total cross section width of no more than five travel lanes, except at intersections. Accommodate travel demand that would otherwise require a width of more than five lanes through increased system connectivity, transit service, use of transportation demand management (TDM) strategies, and other alternative modes of transportation.

Implementation 2-C(3): Require pedestrian/bicycle access ways when there is not a direct street connection, to pass through long blocks, or to connect cul-de-sac streets with nearby streets, or to connect to nearby bicycle paths, etc. to create more direct non-motorized access where appropriate.

Implementation 2-C(4): Involve affected citizens in an advisory role in transportation project design.

Implementation 2-C(5): Design the transportation system with consideration of the needs of persons with disabilities by meeting the requirements in the Americans with Disabilities Act (ADA).

Implementation 2-C(6): Assure that the design and operation of the transportation system allows for the safe and rapid movement of fire, medical, and police vehicles.

Implementation 2-C(7): Require new development and redevelopment projects, as appropriate, to connect to and extend local streets to planned future streets, to neighborhood activity centers, such as parks, schools, and retail centers, to transit routes, and to access adjoining undeveloped or underdeveloped property.

Implementation 2-C(8): Require new development and redevelopment projects to include accessibility for all travel modes and coordinate with existing and planned developments.

Implementation 2-C(9): Limit cul-de-sac streets, minimum access streets, and other "dead end" development to situations where access cannot otherwise be made by a connected street pattern due to topography or other constraints.

Implementation 2-C(10): Adopt maximum block length standards for local streets to assure good circulation.

Implementation 2-C(11): Incorporate into the *Medford Land Development Code* standards to govern the spacing of street intersections, signal installation, driveway access, and sight distance.

Policy 2-D: The City of Medford shall balance the needed street function for all travel modes with adjacent land uses through the use of context-sensitive street and streetscape design techniques.

Implementation 2-D(1): Identify unique street design treatments, such as boulevards or "main" streets, through the development and use of special area plans, neighborhood plans, or neighborhood circulation plans adopted in the *Medford Comprehensive Plan*.

Implementation 2-D(2): Utilize design techniques for local streets, such as reduced widths and lengths, curb extensions, and other traffic calming measures, to lower vehicular speeds, provide a human scale environment, facilitate pedestrian crossing, and minimize adverse impacts on the character and livability of neighborhoods and business districts, while still allowing for emergency vehicle access.

Implementation 2-D(3): When designing new or reconstructed streets, make adjustments as necessary to avoid valuable topographical features, natural resources, historic properties, schools, cemeteries, significant cultural features, etc. that affect the livability of the community and the surrounding neighborhood.

Policy 2-E: The City of Medford shall design to enhance livability by assuring that aesthetics and landscaping are a part of Medford's transportation system.

Implementation 2-E(1): Incorporate aesthetic streetscape features into public rights-of-way, such as street trees, shrubs, and grasses; planting strips and raised medians; street furniture, planters, special lighting, public art, and paving materials which include architectural details.

Policy 2-F: The City of Medford shall bring Arterial and Collector streets up to full design standards where appropriate, and facilitate improving existing local streets to urban design standards where appropriate.

Implementation 2-F(1): Balance the needs of pedestrians, bicyclists, and motor vehicles when reconstructing streets that cannot meet full functional classification standards.

STREET SYSTEM – TRANSPORTATION DEMAND MANAGEMENT – GOALS, POLICIES, AND IMPLEMENTATION MEASURES

Policy 2-G: The City of Medford shall undertake efforts to reduce per capita vehicle miles traveled (VMT) and single-occupancy vehicle (SOV) demand through transportation demand management (TDM) strategies.

Implementation 2-G(1): Promote the use of alternative commute options to reduce motor vehicle travel generated by employment sites and schools by serving as an institutional model for the community through participation in the Transportation Management Association (TMA), providing incentives for City of Medford employees to utilize transportation demand management (TDM) strategies, and actively participating in local, state, and national TDM activities, such as Car Free Day. (Examples of TDM strategies include free or subsidized bus passes, trip reduction planning, compressed work weeks, telecommuting options, flexible work schedules, ride matching for car/van pools, customer and employee parking management, guaranteed rides home in emergencies, indoor bicycle storage, shower/locker facilities, etc.)

Implementation 2-G(2): Encourage employers to design and implement trip reduction plans, including strategies that encourage use of alternative transportation modes, discourage commuting in single occupancy vehicles, and promote telecommuting and the use of work hours that do not contribute to peak-hour congestion. Encourage private sector employers to take advantage of tax incentive programs for transportation demand management efforts. Encourage the formation of employer transportation management associations that allow the pooling of resources in implementing trip reduction plans, such as guaranteed emergency ride home and vanpool programs.

Implementation 2-G(3): Support and assist the efforts of the Rogue Valley Transportation District in maintaining a regional transportation demand management (TDM) program, which includes such components as a rideshare matching program, carpool/vanpool

~~matching, park-and-ride lots, and information regarding transit service, bicycle routes, telecommuting, etc.~~

~~**Implementation 2-G(4):** Participate in public outreach to raise awareness about the use of transportation demand management (TDM) strategies, such as periodic newsletters for decision-makers, employers, schools, organizations, and individuals; information handouts at appropriate public events; advertising and public service announcements; school outreach; services for employers; and recognition for TDM efforts. Actively market to groups having the greatest potential for reducing single occupancy vehicle trips, such as large employment sites and commuting students.~~

~~**Implementation 2-G(5):** Encourage school districts to promote and utilize walking, bicycling, and school busing whenever possible to reduce motor vehicle trips needed to transport students to and from classes and events.~~

~~STREET SYSTEM – TRANSPORTATION SYSTEM MANAGEMENT AND SAFETY – GOALS, POLICIES, AND IMPLEMENTATION MEASURES~~

~~**Policy 2-H:** The City of Medford shall manage and maintain the transportation system in an efficient, clean, and safe manner.~~

~~**Implementation 2-H(1):** Require Traffic Impact Analyses (TIAs), as appropriate, in conjunction with development applications to assess impacts on the existing and planned transportation system, and require transportation system improvements that are identified through the TIA or by other *Medford Municipal Code* requirements as a condition of approval of development permits and land use actions.~~

~~**Implementation 2-H(2):** Utilize access management, including access location and spacing, to increase the capacity and safety of the transportation system. Incorporate access management techniques, such as raised medians, access management plans, driveway consolidation, driveway relocation, and closure of driveway access, into Arterial and Collector street design and development applications.~~

~~**Implementation 2-H(3):** Continue to modernize the traffic signal system and improve its efficiency by ultimately connecting all signals to the centralized traffic control center. Employ traffic signal timing plans that maximize efficiency during different time periods. Provide a program to identify locations for new/modified signals.~~

~~**Implementation 2-H(4):** Utilize Intelligent Transportation Systems (ITS) such as real-time traffic monitoring cameras and management projects, that provide motorist information and incident response/clearance programs, to alleviate traffic congestion.~~

~~**Implementation 2-H(5):** Provide adequate funding to preventatively maintain and manage public paved surfaces, sidewalks, bikeways, bridges, traffic control devices, street lighting, etc., at the lowest life-cycle cost.~~

Implementation 2-H(6): Provide a street cleaning program that uses best management practices (BMPs) to reduce impacts on air and water quality from street debris.

Policy 2-I: The City of Medford shall promote transportation safety.

Implementation 2-I(1): Maintain an inventory of traffic control devices (i.e., traffic signals, signs, striping, and markings).

Implementation 2-I(2): Require maintenance of sight distance areas adjacent to intersections and driveways, to keep clear of fencing, landscaping, foliage, etc. that could obstruct the view of motorists, bicyclists, and pedestrians.

Implementation 2-I(3): Actively enforce motor vehicle codes related to transportation safety.

Implementation 2-I(4): Promote traffic safety education and awareness, emphasizing the responsibilities required of motor vehicle drivers, in order to reduce the per capita number of motor vehicle accidents.

STREET SYSTEM – PARKING MANAGEMENT – GOALS, POLICIES, AND IMPLEMENTATION MEASURES

Policy 2-J: The City of Medford shall prohibit on-street parking on Arterial and Major Collector streets in order to maximize the capacity of the transportation system except in the Downtown Parking District, in adopted Transit Oriented Districts (TODs), or where permitted through the development and use of special plans adopted in the *Medford Comprehensive Plan*.

Implementation 2-J(1): Remove existing on-street parking in preference to widening Arterial and Collector streets to gain additional travel lanes, bicycle lanes, and sidewalks, except where on-street parking has been determined to be essential through special plans adopted in the *Medford Comprehensive Plan*.

Implementation 2-J(2): Expand the Downtown Parking District boundaries to be consistent with the Central Business District (C-B) overlay zone boundaries and manage as a financially self-supportive operation.

Policy 2-K: The City of Medford shall manage on-street parking in the Downtown and in other adopted Transit Oriented Districts (TODs) to assist in slowing traffic, facilitating pedestrian movement, and efficiently supporting local businesses and residences consistent with the land use and mobility goals for each street.

Implementation 2-K(1): If necessary to preserve the supply of on-street parking in residential areas for use by residents, restrict the overflow parking of nearby employment centers, entertainment venues, schools, or other institutions through use of a residential parking permit program.

Implementation 2-K(2): In areas where demand exists, provide on-street carpool and vanpool parking spaces and/or loading zones having preferential location/timing over general purpose on-street parking spaces, giving consideration to locations where on-street parking is needed to support an existing business district.

Policy 2-L: The City of Medford shall require an appropriate supply and design of off-street parking facilities to promote economic vitality, neighborhood livability, efficient use of urban space, reduced reliance on single occupancy motor vehicles, and to make certain areas, such as Transit Oriented Districts (TODs), more pedestrian friendly.

Implementation 2-L(1): Require a minimum and maximum number of off-street parking spaces based on the typical daily needs of the specific land use type. (A parking space maximum standard assures that unnecessary consumption of land area is avoided.) Designate areas of the City where no off-street parking would be required.

Implementation 2-L(2): Set prices for City-owned public parking facilities to a level that discourages employees from using single occupancy vehicles to commute to work, and that reflects the relative demand for parking and the cost of constructing, maintaining, and operating such facilities. Offer free or discounted prices for carpool parking in public parking facilities.

Implementation 2-L(3): For off-street parking lots over three (3) acres in size, require street-like features along major driveways and safe pedestrian access facilities between the street, locations within the lot, and buildings.

Policy 2-M: The City of Medford shall undertake efforts to contribute to a reduction in the regional per capita parking supply to promote the use of alternatives to the single occupancy motor vehicle.

Implementation 2-M(1): Every five years, estimate the parking supply in areas designated for commercial, industrial, and institutional uses by the *Medford Comprehensive Plan* in order to monitor progress toward meeting the goal of reducing parking supply per capita by ten percent over the 20-year planning period.

Implementation 2-M(2): Allow non-residential development to satisfy off-street parking requirements through preparation and implementation of a trip reduction plan to increase the use of alternative modes of transportation by employees and customers.

Implementation 2-M(3): Assure that major facilities with a high parking demand meet the demand through a combination of shared, leased, and new off-street parking facilities, access by transit, and encourage designs that reduce parking need.

Implementation 2-M(4): Encourage employers to charge for employee parking.

PUBLIC TRANSPORTATION SYSTEM – GOALS, POLICIES, AND

~~IMPLEMENTATION MEASURES~~

~~***GOAL 3: To facilitate the increased use of public transportation in the Medford planning area, as the adequacy of transit service is a measure of the quality of life in a community.***~~

~~**Policy 3-A:** The City of Medford shall undertake efforts to increase the percentage of total daily trips taken in the Medford planning area by transit, consistent with the target benchmarks in the "Alternative Measures" of the 2001-2023 *Rogue Valley Regional Transportation Plan* (RTP).~~

~~**Policy 3-B:** The City of Medford shall support the provision of convenient and accessible transit service to, from, and within the Medford planning area, especially to higher density residential areas, employment centers, and major commercial areas.~~

~~**Implementation 3-B(1):** Support efforts to implement funding strategies that provide adequate, long-term, and stable revenue sources for the transit system, including fares that balance the need for passenger revenues with the goal of maximizing ridership.~~

~~**Implementation 3-B(2):** Support efforts by the Rogue Valley Transportation District to develop and implement a transit system that effectively combines components of radial, neighborhood, and circumferential services, with a minimum of required transfers, to best serve the citizens of and visitors to Medford.~~

~~**Implementation 3-B(3):** Support efforts by the Rogue Valley Transportation District to increase transit service, including increasing the frequency of service (shorter headways), extending the hours of operation, expanding weekend service, and providing express transit service during peak travel periods.~~

~~**Implementation 3-B(4):** Assure that land use planning activities promote transit service viability and accessibility, including locating mixed residential-commercial, multiple-family residential, and employment land uses on or near (within ¼ mile walking distance) transit corridors.~~

~~**Implementation 3-B(5):** Provide transit-supportive street system, streetscape, land division, and site design and operation requirements that promote efficient bus operations and pedestrian connectivity, convenience, and safety.~~

~~**Implementation 3-B(6):** In conjunction with the Rogue Valley Transportation District, establish designs for and implement effective and safe transit stops on Arterial and Collector streets.~~

~~**Implementation 3-B(7):** Work with the Rogue Valley Transportation District to ensure that transit transfer stations and park-and-ride facilities are accessible by pedestrian, bicycle, transit, and motor vehicle travel modes, including provisions for secured bicycle parking, passenger loading, and taxi service, and encourage transit service to intercity passenger bus and aviation terminals.~~

Implementation 3-B(8): Work with employers to increase commuter transit ridership through employer-based incentives, such as subsidized transit passes.

Policy 3-C: The City of Medford shall undertake efforts to increase the percentage of dwelling units in the Medford planning area located within one-quarter mile walking distance of transit routes, consistent with the target benchmarks in the "Alternative Measures" of the 2001-2023 *Rogue Valley Regional Transportation Plan* (RTP).

Policy 3-D: The City of Medford shall link intercity passenger transportation facilities in central Medford to adequate pedestrian facilities, and strive to link all intercity passenger transportation facilities to transit, taxi, and/or shuttle services. The City shall encourage continued operations and future expansion of intercity bus service to and from Medford.

Policy 3-E: The City of Medford shall encourage efforts to make intercity passenger rail service available to the Medford planning area.

BICYCLE SYSTEM – GOALS, POLICIES, AND IMPLEMENTATION MEASURES

GOAL 4: To facilitate the increased use of bicycle transportation in the Medford planning area, as bicycle facilities are a measure of the quality of life in a community.

Policy 4-A: The City of Medford shall undertake efforts to increase the percentage of total daily trips taken by bicycling in Medford consistent with the target benchmarks in the "Alternative Measures" of the 2001-2023 *Rogue Valley Regional Transportation Plan* (RTP).

Implementation 4-A(1): Develop a network of bicycle facilities linking Downtown, other Transit-Oriented Districts (TODs), residential neighborhoods, commercial/employment centers, schools, parks and greenways, community centers, civic and recreational facilities, and transit centers.

Implementation 4-A(2): Design streets and other public improvement projects to facilitate bicycling by providing bicycle-friendly paving, lane width, traffic control, storm drainage grates, striping, signage, lighting, etc.

Implementation 4-A(3): Review all development plans for bicycle system continuity and expansion of the system.

Implementation 4-A(4): Work with the Oregon Department of Transportation to improve bicycling conditions on state highways within the Medford planning area.

Implementation 4-A(5): Provide interconnected off-street multi-use paths along stream and waterway corridors, such as Bear Creek and Larson Creek, and in other suitable locations where multiple street or driveway crossings are unlikely and where such facilities can be constructed without causing significant environmental degradation.

Implementation 4-A(6): Regularly review *Medford Land Development Code* provisions to assure that bicycle facility standards for development projects are adequate to achieve the goals and policies of the *Medford Comprehensive Plan*, including the *Transportation System Plan*.

Implementation 4-A(7): Consider development of on-street "bicycle boulevard" treatments using local streets to enhance the connectivity of this system

Policy 4-B: The City of Medford shall undertake efforts to increase the percentage of Arterial and Collector street miles in Medford having bicycle facilities, consistent with the targeted benchmarks in the "Alternative Measures" of the *Rogue Valley Regional Transportation Plan* (RTP).

Implementation 4-B(1): Assure that bicycle facility improvements are a factor in Medford's annual capital improvement programming and budgeting, using the *Medford Transportation System Plan* as the basis to determine priorities.

Implementation 4-B(2): Utilize all opportunities to add bike lanes on Collector and Arterial streets, such as during reconstruction and re-striping projects. Give priority to bicycle traffic over on-street parking on Collector and Arterial streets designated in the *Transportation System Plan* as, or otherwise determined to be, important bicycling routes. Alternatives should be considered where on-street parking is determined to be essential to the success of adjacent businesses in a pedestrian-friendly environment, such as in Downtown, other TODS, activity centers, etc.

Policy 4-C: The City of Medford shall encourage bicycling as an alternative mode of transportation as well as a recreational activity.

Implementation 4-C(1): Form a bicycle advisory and planning committee to support the City's bicycle transportation goals and advise the City on issues related to bicycles.

Implementation 4-C(2): Continue to coordinate with local and regional bicycling proponents, such as the Jackson County Bicycle Advisory Committee and the Bear Creek Greenway Committee.

Implementation 4-C(3): Regularly maintain bicycle facilities and take actions to improve crossings of railroad tracks, creeks, major streets, etc.

Implementation 4-C(4): Perform accurate record keeping of bicycle volume and accident counts.

Implementation 4-C(5): Whenever feasible, provide public bicycle storage facilities at critical locations within the Downtown and at other activity centers.

Implementation 4-C(6): Install "Share the Road" signage on those Collector and Arterial streets that do not yet have bike lanes.

Implementation 4-C(7): Assure that City of Medford employees, particularly Police Department staff, have adequate training regarding bicycle safety and enforcement issues. Continue and enhance the "Cops on Bikes" program.

Implementation 4-C(8): Initiate a "Share the Road" or similar public information campaign, coordinated with agencies such as the Rogue Valley Transportation District, the Rogue Valley Council of Governments, Jackson County, local bicycling organizations, and nearby municipalities, etc.

Implementation 4-C(9): Support the Rogue Valley Transportation District efforts to facilitate transportation demand management (TDM) strategies that integrate bicycling and transit, such as "bikes on buses", bicycle storage facilities at transit stations and stops, etc.

Implementation 4-C(10): Encourage and support efforts by Medford schools or other community organizations to develop and use a bicycle safety curriculum for students.

PEDESTRIAN SYSTEM – GOALS, POLICIES, AND IMPLEMENTATION MEASURES

GOAL 5: To facilitate the increased use of pedestrian transportation in the Medford planning area.

Policy 5-A: The City of Medford shall develop a connected, comprehensive system of pedestrian facilities that provides accessibility for pedestrians of all ages, focusing on activity centers such as Downtown, other Transit Oriented Districts (TODs), commercial centers, schools, parks/greenways, community centers, civic and recreational facilities, and transit centers.

Implementation 5-A(1): Require development and street construction/renovation projects to include sidewalks and walkways.

Implementation 5-A(2): Design street intersections, particularly Arterial and Collector street intersections, with convenient, safe, and accessible pedestrian crossing facilities.

Implementation 5-A(3): Require development within activity centers, business districts, and Transit Oriented Districts (TODs) to focus on and encourage pedestrian travel, and require sidewalks, accessways, and walkways to complement access to transit stations/stops and multi-use paths.

Implementation 5-A(4): Utilize an interconnecting network of multi-use paths and trails to compliment and connect to the sidewalk system, using linear corridors such as creeks, canals, utility easements, railroad rights-of-way, etc.

Policy 5-B: The City of Medford's first priority for pedestrian system improvements shall be access to schools; the second priority shall be access to transit stops.

Implementation 5-B(1): Complete the pedestrian facility network based on the priorities established in the *Transportation System Plan*, with emphasis on gaps in the system.

Policy 5-C: The City of Medford shall undertake efforts to increase the percentage of total daily trips taken by walking in Medford consistent with the targeted benchmarks in the "Alternative Measures" of the 2001-2023 *Rogue Valley Regional Transportation Plan* (RTP).

Implementation 5-C(1): Encourage walking for both travel and recreation, emphasizing the health, economic, and environmental benefits for the individual and community.

Implementation 5-C(2): Prepare for consideration by the City Council ordinances that require pedestrian-friendly development design that encourages walking.

Policy 5-D: The City of Medford shall undertake efforts to increase the percentage of Collector and Arterial street miles in Medford's adopted Transit Oriented District (TODs) having sidewalks, consistent with the targeted benchmarks in the "Alternative Measures" of the *2001-2023 Rogue Valley Regional Transportation Plan* (RTP).

Policy 5-E: The City of Medford shall promote pedestrian safety and awareness.

Implementation 5-E(1): Develop crosswalk marking and traffic calming policies that address pedestrian safety in appropriate locations, including signalized intersections, controlled intersections near schools, activity centers, Transit Oriented Districts (TODs), and other locations of high pedestrian volumes.

Implementation 5-E(2): Establish standards for maintenance of pedestrian facilities, accessways and paths, including the removal of hazards and obstacles, and maintenance of benches, landscaping, etc.

Implementation 5-E(3): Comply with the requirements of the Americans with Disabilities Act (ADA) regarding the location and design of sidewalks, walkways, and multi-use paths, and discourage the placement of obstructions within sidewalks.

Implementation 5-E(4): Increase enforcement of pedestrian safety laws and regulations, focusing attention on areas of high pedestrian volumes and in activity centers and Transit Oriented Districts (TODs).

Implementation 5-E(5): Encourage schools, safety organizations, and law enforcement agencies to provide information/instruction regarding pedestrian safety, focusing on accident prevention and education of roadway users regarding their responsibilities when driving, bicycling, and walking.

Implementation 5-E(6): Work toward completion of street lighting systems on all Arterial and Collector streets, and facilitate the formation of neighborhood street lighting districts to provide appropriate street lighting on local streets.

~~AIR TRANSPORTATION SYSTEM – GOALS, POLICIES, AND IMPLEMENTATION MEASURES~~

~~***GOAL 6: To facilitate the provision of efficient, safe, and competitive movement of people and goods to and from the Rogue Valley International-Medford Airport, recognizing the value of the Rogue Valley International-Medford Airport as a regional resource.***~~

~~**Policy 6-A:** The City of Medford shall encourage and support the operation, maintenance, and expansion of facilities and services provided at or near the Rogue Valley International – Medford Airport that accommodate domestic and international passenger air travel services, air cargo, charter flight operations, and airport shuttle service, while balancing adverse community impacts.~~

~~**Implementation 6-A(1):** Encourage the Jackson County Airport Authority to coordinate implementation of the *Rogue Valley International-Medford Airport Master Plan*, and any updates, with the City.~~

~~**Implementation 6-A(2):** Provide for transportation improvements that increase vehicular, pedestrian, bicycle, and public transportation connections to the Rogue Valley International-Medford Airport, and encourage direct transit service to the airport passenger terminal when warranted.~~

~~**Implementation 6-A(3):** Prepare for consideration by the City Council, amendments to the *Medford Comprehensive Plan* that provide for the types and levels of public facilities and services needed to support development located at or planned for the airport, including transportation facilities and services, as required by OAR 660-013 "Airport Planning". Consider the airport environs as a priority area for providing urban levels of public facilities and services.~~

~~**Implementation 6-A(4):** Prepare for consideration by the City Council, amendments to the *Medford Comprehensive Plan* that include the maps and information required by OAR 660-013 "Airport Planning". If the airport sponsor does not provide the economic and use forecast information required by the OAR, the City may limit the airport boundary to areas currently devoted to the airport uses described in the OAR.~~

~~**Implementation 6-A(5):** Prepare for consideration by the City Council ordinances to carry out the requirements of OAR 660-013 "Airport Planning", which require an Airport Safety Overlay Zone to promote aviation safety, if the currently adopted Airport Approach (A-A) and Airport Radar (A-R) Overlay Zoning Districts are not in compliance.~~

~~**Implementation 6-A(6):** Prepare for consideration by the City Council ordinances to carry out the requirements of OAR 660-013 "Airport Planning" regarding airport compatibility, consistent with applicable statewide planning requirements.~~

~~**Implementation 6-A(7):** Regularly review the *Medford Comprehensive Plan* and *Land Development Code* provisions to assure adequate mitigation of aviation impacts, and to assure that land uses near the Rogue Valley International-Medford Airport are compatible~~

with and support airport operations, and minimize noise and safety conflicts and community impacts.

FREIGHT MOVEMENT – GOALS, POLICIES, AND IMPLEMENTATION MEASURES

GOAL 7: To facilitate the provision of a multi-modal transport system for the efficient, safe, and competitive movement of goods and services to, from, and within the Medford planning area.

Policy 7-A: The City of Medford shall promote accessibility to transport modes that fulfill the needs of freight shippers.

Implementation 7-A(1): Develop and adequately sign a street system that provides direct and efficient access to and between industrial and commercial centers, regional intermodal freight facilities, and statewide transport corridors.

Implementation 7-A(2): Utilize street design standards that meet the weight and dimensional needs of trucks for streets that serve industrial and commercial areas and those designated as "truck routes".

Implementation 7-A(3): Encourage the development of railroad freight services to industrial and commercial areas.

Implementation 7-A(4): Encourage the development of air freight services at the Rogue Valley International-Medford Airport.

Implementation 7-A(5): Encourage the development of intermodal freight transfer facilities.

Implementation 7-A(6): Review results of Rogue Valley Metropolitan Planning Organization (RVMPO) "Freight Study" and incorporate these into the *Medford Transportation System Plan* as appropriate.

Policy 7-B: The City of Medford shall strive to balance the needs of moving freight with community livability.

Implementation 7-B(1): Work to increase freight transport safety awareness, and promote commercial vehicle safety programs provided by public or private agencies and organizations.

Implementation 7-B(2): Work with public agencies and private freight service providers to reduce the number and severity of commercial transport-related accidents.

Implementation 7-B(3): Encourage responsible agencies to develop and enforce regulations assuring the safe transport of hazardous materials through the Medford

planning area, and prepare to respond to emergencies involving the transport of hazardous materials.

Implementation 7-B(4): Employ physical and/or legal measures to reduce through commercial vehicle traffic on residential streets.

Implementation 7-B(5): Work with railroads and appropriate state agencies to minimize the blockage of public streets at railroad crossings to facilitate traffic movement, especially emergency service vehicles.

Implementation 7-B(6): Consistent with the *Oregon Rail Plan*, establish City policy that seeks to avoid or minimize the number of future railroad at-grade crossings when new streets are planned; avoids creating intersections of major streets and railroads where possible, locates new parallel streets at least 500 feet from railroads to allow for industrial development between the tracks and the roadway, and plans community development with sensitivity to rail noise and other potential conflicts.

Implementation 7-B(7): Coordinate on-going maintenance and repair of streets at existing at-grade rail crossings with applicable owner/operator of railroad track.

Policy 7-C: The City of Medford shall promote accessibility to, protection of, and the appropriate location of regional pipeline systems.

TRANSPORTATION AND LAND USE – GOALS, POLICIES, AND IMPLEMENTATION MEASURES

GOAL 8: To maximize the efficiency of Medford's transportation system through effective land use planning.

Policy 8-A: The City of Medford shall facilitate development or redevelopment on sites located where best supported by the overall transportation system that reduces motor vehicle dependency by promoting walking, bicycling and transit use. This includes altering land use patterns through changes to type, density, and design.

Implementation 8-A(1): Through revisions to the *Medford Comprehensive Plan* and *Land Development Code*, provide opportunities for increasing residential and employment density in locations that support increased use of alternative travel modes, such as along transit corridors.

Implementation 8-A(2): Maintain and continue enforcement of the *Medford Land Development Code* provisions which require new development to accommodate multi-modal trips by providing bicycle racks, connecting sidewalks, building entrances near the street, and transit facilities.

Policy 8-B: The City of Medford shall undertake efforts to increase the percentage of dwelling units and employment located in Medford's adopted Transit Oriented Districts (TODs), consistent

~~with the targeted benchmarks in the "Alternative Measures" of the *2001-2023 Rogue Valley Regional Transportation Plan* (RTP).~~

~~**Implementation 8-B(1):** Through revisions to the *Medford Comprehensive Plan* and *Land Development Code*, pursue changes to planned land uses to concentrate employment, commercial, and high density residential land uses in Transit Oriented Districts (TODs).~~

~~**Implementation 8-B(2):** Complete and adopt a land use/transportation plan, design guidelines, street and streetscape standards and implementing ordinances for the Southeast Medford TOD, the West Medford TOD and the Delta Waters TOD, and mixed-use areas.~~

~~**Implementation 8-B(3):** Review and revise the *Medford Land Development Code* to define "mixed-use development" for purposes of tracking this type of development. In the interim, the definition of mixed-use development contained in the *Oregon Transportation Planning Rule* (TPR) will be used.~~

~~**Implementation 8-B(4):** Establish a mechanism like that discussed in Appendix I of the *Medford Transportation System Plan* entitled "Development Tracking" for the purpose of tracking mixed-use development within the City consistent with the requirements of "Alternative Measures" 5 and 6 of the *2001-2023 Rogue Valley Regional Transportation Plan* (RTP).~~

GOAL 1 – SAFETY AND PUBLIC HEALTH

The transportation system will improve safety for users of all modes of transportation and be a public resource that supports public health in the community.

Objective 1: Transportation improvement projects and transportation management decisions shall be evaluated to reduce risk to the travelling public, and improvement projects and management decisions shall strive to enhance safety for the travelling public.

Action Items:

1-a: Look for opportunities to improve the system to reduce traffic fatalities and serious injuries.

1-b: Identify and install physical measures and improvements needed to eliminate safety hazards along high-crash corridors and at high-crash intersections, including a focus on improvements to protect more vulnerable users, such as children and those with disabilities.

1-c: Identify high-traffic bicycle routes for more frequent street sweeping to remove debris that puts bicyclists at risk of crashes.

1-d: Design bike facilities that preferably separate bicycle traffic from vehicular traffic on Major Arterials by providing separate bike path systems such as off road shared-use paths or by diverting bicycle traffic onto parallel roads with adequate on road facilities when feasible.

1-e: Develop traffic-calming design standards and an implementation program for reconstruction projects within existing residential neighborhoods and new roads within proposed residential neighborhoods that accommodate safe freight movements within neighborhood and community commercial locations.

1-f: Collect and maintain safety data to identify risks, as well as, to guide policy and evidence-based decision making. Data shall be used to make policy choices and to direct resources to enhance safety opportunities that will be the most beneficial.

1-g: Assess and identify deficient rail crossings for vehicles, pedestrians, and bicycles.

Objective 2: Continue to remove impediments to mobility for vulnerable citizens such as those with disabilities, children, and older adults.

Action Items:

2-a: Continue to ensure all new transportation facilities, and improvements comply with the Americans with Disabilities Act (ADA) of 1990, and implement necessary policies and procedures from the ADA project action plan.

2-b: Coordinate with local hospitals, schools, social service providers and similar organizations to identify the transportation needs of the groups they serve and identify opportunities to improve mobility for the providers' constituents.

2-c: Take regular action to ensure the safety of heavily used pedestrian crossings.

2-d: Identify key locations that represent opportunities for low-stress routes for bicycle travel throughout the City.

Objective 3: Promote active transportation as a means of improving public health.

Action Items:

3-a : Participate in, collaborate with, and promote active transportation programs and outreach like RVTD's Go by Bike Week, the Drive Less Challenge, Safe Routes to Schools Program(s), Rogue Valley Bike Share, or similar programs .

3-b: Coordinate and implement a bicycle diversion program. (Such programs allow a person issued a bicycle citation to attend a bicycle safety class instead of appearing in court or paying a fine).

3-c: Develop an action plan for implementation of the Citywide Path and Trail Network outlined in the City's Leisure Services Plan.

GOAL 2 – ECONOMIC DEVELOPMENT

The transportation system shall enhance economic development and vitality within the City and throughout the Region.

Objective 4: Provide transportation facilities that support existing and planned land uses, consistent with the City's Comprehensive Plan.

Action Items:

4-a: Evaluate and modify, as deemed appropriate the City's policy on transportation facility concurrency.

4-b: Ensure development throughout the city and within the 2016 Urban Growth Boundary expansion areas are consistent with the Functional Classification plan and other planned transportation improvements.

4-c: Implement adopted neighborhood plans including the Bear Creek Master Plan.

Objective 5: Maintain and improve the efficiency of the movement of freight and goods by ground, rail, air, pipeline, and transmission infrastructure.

Action Items:

5-a : Assess land use conflicts affecting freight service providers and develop best practices that prioritize safe, efficient, and reliable freight connections while reducing neighborhood impacts.

5-b: Review and consider revisions to the existing truck route designations within the City of Medford and implement street design standards that meet the weight and dimensional needs of trucks for streets that serve industrial and commercial areas and those designated as "truck routes."

5-c: Strive to balance the needs of moving freight with community livability.

5-d: Advocate for and support designation of State and Federal priority freight routes within the City of Medford.

Objective 6: Increase resilience of the local freight and logistics network to natural disaster.

Action Items:

6-a: Using the City's Natural Hazards Mitigation Plan and other resources, assess the local freight routes for vulnerabilities to natural disaster, in particular a Cascadia Event, and

develop and implement a mitigation strategy by 2022. Example locations include but are not limited to Foothill Road, North Phoenix, and South Stage Road

Objective 7: Identify and improve transportation facilities that support the Region's tourism industry

Action Items:

7-a: Support the efforts of the Rogue Valley International-Medford Airport and the airport's associated master plan.

7-b: Strategically implement the Citywide Path and Trail Network found in the Leisure Services Plan to support recreational tourism in the City and region.

Objective 8: Support initiatives to redevelop Downtown, Liberty Park, and other existing neighborhoods through transportation infrastructure investments.

Action Items:

8-a: Evaluate the feasibility of expanding the Downtown Parking District.

8-b: Implement transportation infrastructure improvement projects recommended by the Downtown, Liberty Park, and other neighborhood plans including the Bear Creek Master Plan. Coordinate the TSP with neighborhood planning efforts to ensure consistency between neighborhood plans and the TSP.

GOAL 3 – LIVABILITY

Design and construct transportation facilities to enhance the livability of the City's neighborhoods and business centers.

Objective 9: The City will balance transportation system objectives to improve mobility against objectives to avoid disruption of existing neighborhoods and nonresidential districts, and minimize impacts to individual properties.

Action Items:

9-a: Limit Major Arterial streets to a total cross-section width of no more than five travel lanes, except at intersections. Accommodate travel demand that would otherwise require a width of more than five lanes through increased system connectivity, transit service, use of transportation demand management (TDM) strategies, and other alternative modes of transportation.

9-b: Prior to upgrading a street classification in residential and mixed-use areas to a higher order classification, the City will consider the impacts to neighborhood livability. Alternatives that allow existing neighborhoods to remain intact will be considered. If

reclassification is necessary, mitigation measures and/or street-design alternatives will be considered.

9-c: Incorporate context-sensitive street and streetscape design techniques in order to balance the needed street function for all users and modes with the needs of the surrounding built environment. The selected design solution should take into consideration whether the street is new or an existing "legacy" street.

9-d: Implement transportation demand management strategies, when appropriate, to mitigate congestion prior to roadway expansion.

Objective 10: Increase the number of walkable, bikeable, mixed-use, transit oriented and transit supportive neighborhoods while promoting connectivity to existing neighborhoods.

Action Items:

10-a : Re-assess and consider implementation of the West Main Transit Oriented Development (TOD) plan as a neighborhood plan or corridor plan and consider developing other such plans for downtown and other neighborhoods.

10-b: Re-evaluate the maximum and minimum block length perimeter standards to ensure direct street routes and connectivity and reduce travel distances to all users.

10-c: Research and consider options for development standards and incentives to promote mixed-use and transit oriented development.

10-d: Consider designating Medford's multimodal mixed-use areas (MMAs) and prioritize pedestrian, bicycle, and transit investments within targeted employment and residential areas that foster mixed-use development. Consider adopting incentives to increase the number of dwelling units within a quarter-mile of transit routes.

10-e: Ensure implementation of the Southeast Medford Area Plan with regard to greenways, land use, paths, trails, roadways, and other transportation related facilities.

GOAL 4 – CONNECTIVITY

Achieve connectivity appropriate for planned land uses in the area for all modes which is well connected to the regional system.

Objective 11: The City of Medford will strive to develop and maintain a well-connected transportation system for all modes and users.

Action Items:

11-a: Work with private and public sector partners including but not limited to the Metropolitan Planning Organization (MPO), Rogue Valley Area Commission on Transportation (RVACT), and Jackson County to complete the major street network as

shown on the Functional Classification Map, prioritizing completion of the City's "Arterial Ring", major arterials, and regionally significant transportation projects like the South Stage Overcrossing/Extension.

11-b: Implement street design standards for all new development that provide facilities for all modes of transportation, including walking and bicycling, and that promote safe driving.

11-c: Implement street design standards for existing facilities that allow for flexibility and application of alternative street designs where construction of facilities to the City's adopted design standard for new development would not be economically or physically feasible due to existing neighborhood and development constraints.

11-d: Create an intersection control evaluation process and criteria that includes a preliminary determination for the use of a round-about and includes a detailed evaluation where a round-about is a potentially appropriate solution. Traffic control changes at intersections, such as installation of traffic signals or modern roundabouts, should at a minimum include safety, life-cycle costs and minimization of total delay as criteria when alternatives are considered.

11-e: Identify future opportunities to increase the number of direct north-south connections east of I-5 in order to reduce congestion along parallel routes and at intersections.

11-f: Implement wayfinding programs (through Transportation Options Planning) using conventional signage and emerging technologies to assist travelers in efficiently reaching destinations including downtown, historic districts, retail and dining destinations, shared-use paths and other recreational destinations; and ensure consistent signage with other City efforts.

11-g: Implement roadway designs on existing and new higher order streets that encourage reasonably direct and safe bicycle and pedestrian travel. In regard to the installation of bicycle infrastructure, the City should identify lower order street network connections first, off road/separated shared-use path locations second, and the typical cross section last when planning the bicycle network.

11-h: Establish a policy that ensures intervening streets not yet built between existing and new development are constructed and compensated with the adjacent development or prioritized and built by the City.

11-i: Consider standards that allow the construction of off street improvements (such as urban trails, greenways, etc.) or consideration of a fee in-lieu as a condition of approval for land use actions in areas where these facilities are planned to serve as a transportation connection.

Objective 12: Improve access (on or off roadway) for people to walk and bike to public places especially schools, parks, employment centers, commercial areas, and other public facilities.

Action Items:

12-a: Coordinate with local and regional partners to develop trails, shared-use paths and other active transportation facilities that better connect the City's neighborhoods, schools, parks, and various activity centers.

12-b: Improve pedestrian and bicycle connectivity to current and proposed major shared-use paths, such as the Bear Creek Greenway; this may include land acquisition and dedication from private and public land owners to implement trail connections where needed.

12-c: Identify gaps such as missing bike facilities and sidewalks and systematically upgrade the network to correct deficiencies. Sidewalk infill should be the highest priority for non-auto related project funding, with a minimum of a 2:1 ratio of pedestrian to bicycle facility expenditures.

12-d: Review the National Association of City Transportation Officials Designing for All Ages and Abilities Bicycle Facilities guidelines (December 2017) when considering the installation of bicycle facilities.

12-e: Develop and adopt a separate bicycle and pedestrian plan for the City that focuses on these facilities as an adjunct to the Transportation System Plan.

Objective 13: Improve vehicle, pedestrian, and bicycle network connections with current and planned public transportation routes and improve public transportation service.

Action Items:

13-a: Identify and prioritize sidewalk infill projects within a quarter-mile radius of current and planned transit routes and/or stops.

13-b: On arterials and collectors, coordinate public transportation facility design and development with RVTD that considers the design of stop locations and facilities, transit pull-outs and other similar features.

13-c: Work with RVTD to provide locations for transfer centers outside of downtown Medford consistent with RVTD's long range plan.

13-d: When applicable, work with RVTD to assess the feasibility of developing park-and-ride facilities in strategic locations around the City.

13-e: Work with RVTD to improve public transportation connections between the airport and population centers, such as downtown and neighborhoods.

13-f: Participate in RVTD system planning efforts and amend the TSP as necessary in order to recognize the most current RVTD master plan.

GOAL 5 – FINANCING

Optimize funding resources so that transportation investments are fiscally sound and economically sustainable.

Objective 14: Systematically and regularly plan and predict the need for the acquisition of needed public right-of-way in order to implement the adopted Functional Classification Map.

Action Items:

14-a: Ensure future development includes building and extending local streets to enhance street connectivity within neighborhoods and to the higher order street network.

Objective 15: When opportunities arise, the City will deploy new technologies that safely increase the efficiency of existing street facilities to reduce the need for roadway expansion.

Action Items:

15-a: Continue to implement Intelligent Transportation Systems (ITS) to maximize capacity in key corridors.

15-b: Coordinate with RVTD to identify potential Transit Signal Priority corridors and implement Transit Signal Priority corridors when appropriate.

15-c: Develop policies as new forms of transportation demand are emerging that anticipate the impact of changing demands. Examples of such areas of policy development are autonomous vehicles, Transportation Network Companies, and other similar emerging technologies on the transportation system.

15-d: Improve sampling and analysis methods to estimate trips made by walking, biking, and driving. Investigate and apply emerging technologies that enable accurate, cost-effective assessment of various types of transportation activity and phenomena including traffic congestion, infrastructure conditions, etc.

Objective 16: Amendments to the land development code and municipal code to implement the TSP shall be targeted for completion within 24 months of TSP acknowledgement.

Action Items:

16-a: Modify land use review procedures to allow street cross-section standards to be applied in a flexible manner based on identified criteria or standards. Examples of flexibility may include: adopting multiple street cross-section alternatives for a single functional classification; establishing ranges of improvement widths for specific elements;

allowing the elimination or reduction of aesthetic elements where constraints make it appropriate.

16-b: Review landscape requirements within the Land Development Code to allow flexibility with the amount and type of landscaping and ground cover installed while still ensuring beautification and storm water benefits along the roadways.

16-c: Incorporate the legacy street standards into the Land Development Code in order to address future development requirements along these roadways and outline who has the authority to approve deviations.

Objective 17: Partner with local jurisdictions, state and federal agencies, and private sector partners to maximize the City's return on transportation investments whenever possible.

Action Items:

17-a: Continue to work with ODOT, Jackson County, RVTD, and neighboring cities to fund roads, pedestrian, and bicycle facility improvements along State and regional highways/roadways and major transit routes.

17-b: Partner with schools to identify impediments to walking to school and implement Safe Routes to School solutions.

17-c: Continue active membership in the Rogue Valley Metropolitan Planning Organization (RVMPO) and associated planning efforts, and routinely participate in updating the MPO Transportation Improvement Program (TIP) to ensure that the City transportation projects are leveraged with the region's discretionary and special funding opportunities.

17-d: Collaborate with private developers through public-private-partnerships to fund public transportation infrastructure that supports proposed development.

17-e: Recognize the importance of shifting project priorities to capture transportation funding opportunities such as Statewide Transportation Improvement Program (STIP) funding and other such sources.

Objective 18: Support the development of stable and flexible transportation financing that provides adequate funding sources for Medford's transportation system while supporting the TSP's economic development goal.

Action Items:

18-a: Collect transportation system development charges (SDC's), as defined by Oregon Revised Statutes and local ordinances, to mitigate impacts of new development on Medford's Transportation System.

18-b: Assess the effectiveness of current funding sources and identify new funding sources during preparation of biennial budgets including the use of tax increment financing and interjurisdictional agreements. Update policies and regulations to accommodate changes as needed.

GOAL 6 – ENVIRONMENT

Reduce environmental impacts from transportation

Objective 19: Reduce environmental impacts of the transportation infrastructure.

Action Items:

19-a: Consider alternative transportation facility design standards that reduce impervious surfaces and favor management of storm water runoff using Low Impact Development (LID) techniques.

19-b: Determine the feasibility of incorporating renewable energy technologies into publicly owned transportation facilities to offset cost and impacts.

19-c: Incorporate riparian and stream restoration into shared-use path and trail development projects as opportunities present themselves.

Objective 20: Adopt policies designed to reduce per capita Vehicle Miles Traveled (VMT), reliance on Single-Occupant Vehicle (SOV) trips, and roadway congestion.

Action Items:

20-a: Develop parking strategies that encourage non-auto travel to mixed-use neighborhoods, downtown and other major travel destinations.

20-b: Assess off-street parking standards to reduce minimum off-street parking requirements within Activity Centers (as identified in Chapter 5.5 of the Regional Transportation Plan) and other multimodal mixed-use areas.

20-c: Partner with employers and others to implement travel demand management strategies that encourage modes of travelling to work other than SOV trips, including carpooling; employer-supported public transportation passes; incentives for bicycle and pedestrian commuting; telecommuting and other alternatives.

20-d: Identify, in conjunction with RVTD, areas where transit route expansion could be added to alleviate congestion, SOV, and VMT.

20-e: Modify development standards to incentivize large employment and residential developments to implement alternative transportation programs that reduce SOV trips (such as free or subsidized transit passes for employees or alternative work schedules).

Objective 21: Reduce emissions of atmospheric pollutants including greenhouse gas emissions and particulate matter.

Action Items:

21-a: Analyze the feasibility of converting or replacing publicly owned vehicles (at time of scheduled fleet vehicle replacement) to those using renewable, low emitting, and/or non-emitting technologies (such as electric plug in hybrid, Compressed Natural Gas (CNG), or Renewable Natural Gas (RNG) fuels).

21-b: Evaluate incentives for developer-provided neighborhood Electric Vehicle charging stations.

21-c: Continue to develop tree canopy along higher-order streets.

21-d: Promote active transportation through development of new pedestrian and bicycle facilities and associated education/incentive campaigns and programs

City of Medford

Planning Department

Working with the community to shape a vibrant and exceptional city

MEMORANDUM

Subject	Transportation System Plan – Draft document
File no.	CP-16-036
To	Mayor and City Council
From	Karl MacNair, P.E. Transportation Manager & Carla Angeli Paladino CFM, Principal Planner
Date	August 2, 2018 *for 08/09/2018 Study Session*

COUNCIL DIRECTION

Project List

- What funding scenario do you want included in the TSP?

Document Draft

- What comments or questions do you have on the draft?
- What additions or changes would you like to see incorporated?

PRESENTATION OUTLINE

Introduction and Presentation – Karl MacNair and Carla Angeli Paladino
Discussion and Direction - Mayor and City Council

OVERVIEW

Since 2010, the City has been working on updating the Transportation System Plan. The current plan was adopted in 2003. The City has grown since that time and a new plan is needed. A revised and adopted transportation plan is necessary in order to accommodate growth within the City limits as well as for development to occur within the approved Urban Growth Boundary expansion areas.

Since July 2017, staff, City Council, the advisory committees, and the public have been involved in shaping the elements of the plan. Staff and the City Council have met regularly since August 2017, to review, discuss, and provide feedback on the following topics related to the document.

- Public Participation and Outreach
- Vision, Goals, Objectives, and Action items
- Level of Service and Concurrency
- Transportation Planning Rule
- Design Guidelines and Implementation
- South Stage Overcrossing project
- Project Prioritization

The Planning Commission and advisory committees have been kept informed about these topics also. The advisory committees including the Planning Commission will be presented the draft TSP in late August.

A copy of the draft TSP was provided to Council on May 24, 2018. A brief overview of the different elements of the plan was presented during the study session. In June, a subcommittee of the Council met to discuss the Goals and Objectives of the plan and make changes. The proposed changes have been incorporated into the draft document for the Council's review and comment. The legacy street table that was inserted into the Goals and Objectives section has been reformatted and moved to Section 5 under the Legacy Street information. A new action item related to adopting legacy street standards into the Land Development Code has been added to the Goals and Objectives (Action 16-c). Codifying the changes related to the legacy street standards is also included in the list of Key Code and Policy Amendments addressed in Section 6 of the plan.

PROJECT FUNDING

Historical Grant Funding

Staff has been asked to report on the amount of funds that have been received from grants to help leverage local funds over the years. Staff was able to determine that a total of approximately $42 million in grants have been received for street projects since 2004. A listing of the grants and their amounts is attached as **Exhibit 7**.

$42 million over 14 years averages to $3 million per year. However, grant funding is typically allocated through a competitive process and is only available for a specific purpose. Some of the grants received over the years have been for projects not identified in the last TSP such as paving alleys, improving railroad crossings, and bridge replacements. For this reason, staff included a conservative assumption of $700,000 per year for the TSP 20-year Revenue Estimate. The impacts to the project list of assuming either $3 million or $1.5 million annually were studied and are discussed under the various scenarios.

Beginning Fund Balance

Included in the $30,000,000 beginning fund is the Street SDC Fund ($11,736,700), Gas Tax ($15,606,900) and the Street Improvement Fund ($3,029,600) and excludes the Street Utility Fund, which is for maintenance. These total $30,373,200, which is the actual beginning fund balance for fiscal year 2018. Note that ending fund balances fluctuate in response to the types and funding sources of projects in the budget. For example, the gas tax beginning fund balance is

projected to be $11.3M in the next budget. Beginning fund balances are also effected by grant awards. In the past few years, we have received substantial grant funds. Grants have to be spent quickly or be returned, so other projects may be deferred to focus on these requirements.

At the time the revenue estimate was initially put together, we were still using a projected balance so staff rounded to $30,000,000. The Street SDC Fund is for collector and arterial street improvements (construction). The Gas Tax can be spent on construction, maintenance, and operations.

Currently, the following projects are obligated in the beginning fund balance and total approximately $16.7 million:

- Columbus Ave Extension
- Delta Waters Road fill-ins
- Obligated SDC Credits for completed developer projects
- Contingency

STREET IMPROVEMENT FUND

HB2017 and Street Utility Fee Increases

Staff has been asked to answer questions about the projected revenue estimate and project funding as it relates to the Street Utility Fee increases. The projected revenue increase from the state as from HB2017 can be used to offset the proposed Street Utility Fee increases over the next three years. By the third year, the anticipated amount generated by the Street Utility Fee increases is essentially equal to the anticipated revenue from HB2017. If HB2017 is used to fund maintenance in lieu of Street Utility Fee increases, then $36,581,000 is removed from the projected revenue estimate. Impacts to the project list are discussed below under the various scenarios.

Street Maintenance Costs

Part of what is driving the maintenance cost increases are the requirements to replace ADA ramps which are triggered by pavement maintenance activities. This requirement has led to funds being reduced for general street maintenance and are highlighted in the following paragraph.

2011 Pavement Management Analysis Report by Infrastructure Management Services, Tempe, AZ. "Steady State – identifies the annual budget to maintain the Pavement Condition Index at 75. For Medford the Steady State budget is $2.5M/yr."

For 2015-2017 Budget:
Contract pavement maintenance was budgeted at $3M
City forces did approximately $1M of pavement maintenance in these two years

For fiscal year 2016 which started July 1, 2015:
2016 pavement maintenance required budget adjusted for inflation = $2.8M
2016 pavement maintenance spent= $1.98M
2016 ADA ramps = $639K

For fiscal year 2017 which started July 1, 2016:
2017 pavement maintenance required budget adjusted for inflation = $2.9M
2017 pavement maintenance spent = $696K
2017 ADA ramps = $696K

Note: Without ADA ramp expense pavement maintenance would equal 70% of steady state recommendation.

Project Funding Scenarios
Six project funding scenarios have been developed to show the Council how different decisions impact the proposed project list. These are explained in detail below. None of the scenarios include a projection of escalation for revenue or expenditures. This is a simplification that staff made because the estimated costs of projects are not being escalated. We do not know when the projects will be constructed. There is escalation applied to the cost of maintenance to account for the fact that gas tax revenue is expected to be flat or decrease as people buy more fuel-efficient or alternate fuel cars.

Scenario 1 is the scenario council has previously seen, assuming all the HB2017 revenue is available for projects and including a conservative estimate of grant funding ($700,000 annually). **Exhibit 1a** is the Projected Revenue Estimate and **Exhibit 1b** is the associated TSP Tier 1 Project List.

Scenario 2 assumes HB2017 revenue is spent on maintenance and includes a conservative estimate of grant funding ($700,000 annually), reducing projected revenue by $36,581,000. **Exhibit 2a** is the Projected Revenue Estimate, **Exhibit 2b** is the associated TSP Tier 1 Project List, and **Exhibit 2c** is the list of projects that were moved from Tier 1 to Tier 2 to create the new project list. Fourteen (14) projects were moved to Tier 2 and the funding for the three programmatic projects was reduced.

The remaining Tier 1 projects, shown on **Exhibit 2b**, include the two remaining 17-Project List projects, all projects needed to maintain Level-of-Service targets (LOS D and E), the $15,000,000 allocated to Foothill / N Phoenix / S Stage Rd corridor, already budgeted Spring and Springbrook intersection improvements, replacement of the signal at 12th and Riverside, and the programmatic projects for sidewalk infill, bicycle network gaps, and signal controller upgrades at a reduced funding level.

Scenario 3 assumes HB2017 revenue is spent on projects and includes the historical annual average of grant funding ($3,000,000 annually), increasing projected revenue by $46,000,000. **Exhibit 3a** is the Projected Revenue Estimate, **Exhibit 3b** is the associated TSP Tier 1 Project List, and **Exhibit 3c** is the list of projects that were moved from Tier 2 to Tier 1 to create the new project list. The Foothill / N Phoenix / S Stage Rd corridor funding was increased, Eleven (11) projects were moved to Tier 1, and funding for the sidewalk and bicycle network programmatic projects was increased.

Scenario 4 assumes HB2017 revenue is spent on maintenance and includes the historical annual average of grant funding ($3,000,000 annually), increasing projected revenue by $9,419,000. **Exhibit 4a** is the Projected Revenue Estimate, **Exhibit 4b** is the associated TSP Tier 1 Project List, and **Exhibit 4c** is the list of projects that were moved from Tier 2 to Tier 1 to create the new project list. Three (3) projects were moved to Tier 1, and funding for the sidewalk programmatic project was increased.

Scenario 5 assumes HB2017 revenue is spent on projects and includes grant funding of $1,500,000 annually, increasing projected revenue by $16,000,000. **Exhibit 5a** is the Projected Revenue Estimate, **Exhibit 5b** is the associated TSP Tier 1 Project List, and **Exhibit 5c** is the list of projects that were moved from Tier 2 to Tier 1 to create the new project list. Five (5) projects were moved to Tier 1 and funding for the sidewalk and signal controller upgrade programmatic projects was increased.

Scenario 6 assumes HB2017 revenue is spent on maintenance and includes grant funding of $1,500,000 annually, reducing projected revenue by $20,595,000. **Exhibit 6a** is the Projected Revenue Estimate, **Exhibit 6b** is the associated TSP Tier 1 Project List, and **Exhibit 6c** is the list of projects that were moved from Tier 1 to Tier 2 to create the new project list. Six (6) projects were moved to Tier 2 and the limits of the Kings Highway Urban Upgrade was reduced.

Scenario Summary:

Scenario #	HB2017	Annual Grant Funding	20-year Revenue Available for Capital Projects	Difference from Scenario 1	Exhibits
1	Projects	$700,000	$72,440,343	$0	1a, 1b
2	Maintenance	$700,000	$35,859,063	($36,581,280)	2a, 2b, 2c
3	Projects	$3,000,000	$118,440,343	$46,000,000	3a, 3b, 3c
4	Maintenance	$3,000,000	$81,859,063	$9,418,720	4a, 4b, 4c
5	Projects	$1,500,000	$88,440,343	$16,000,000	5a, 5b, 5c
6	Maintenance	$1,500,000	$51,859,063	($20,581,280)	6a, 6b, 6c

Council direction is needed on what funding scenario and project list to include in the TSP.

PLAN ELEMENTS

The plan is separated into two volumes. Volume I is the main document which is organized into six sections and an attachment. Within Volume I reside the goals and objectives, existing conditions analysis, project list, funding sources and the City's plans for auto, bike, pedestrian, and transit travel modes. Volume II is the appendix to the main document and provides the background data, technical memoranda, and analysis for the plan. A brief description of each of the sections and what they contain is described below.

Volume I

Section 1: Introduction

The Introduction section frames the purpose of the document and how the plan can be achieved through the planning period. It sets the context for why this plan is needed, describing changes occurring with the expansion of the Urban Growth Boundary and growth in general. This section also identifies the statutory requirements found in the Oregon Revised Statute and Oregon Administrative Rules the plan must adhere to. The Introduction explains how the project was coordinated with City Council, regional partners, the advisory committees, and the public, and explains how projects are prioritized.

Section 2: Vision, Goals, Objectives, and Action Items (VGO&A)

This section outlines the Vision, Goals, Objectives and Actions that help guide the future transportation system and how it is envisioned to be implemented. The VGO&As have been updated several times throughout this process. As currently written, the VGO&As incorporate comments and revisions identified by a subcommittee of the Council who reviewed them in June 2018.

Section 3: Existing Conditions and Future Needs Assessment
The assessment portion of the plan provides a baseline of the existing infrastructure from sidewalks to the roadway Functional Classification Plan. It identifies the deficiencies and opportunities that exist within the system helping set the framework for needed projects in the next section.

In regards to intersection capacity needs (Level of Service), this section identifies existing conditions at signalized intersections and the projected traffic conditions in the future year (2038). This data informs intersection improvements needed in order to maintain Level of Service "D" into the future for all intersections with the exception of two. The Baseline Conditions Memorandum found in Volume II of the plan provides the detailed analysis of this summary. Direction on the level of service standard was provided at the March 22nd City Council study session.

Another example of information provided in this section relates to safety and the historical crash data related to automobile, pedestrian, and bicycle incidences from 2011-2015. The detailed information regarding crash rates, crash trends, as well as the intersections and roadway segments identified through ODOT's Statewide Priority Index System (SPIS) and All Roads Traffic Safety (ARTS) program are further detailed in the Safety Memorandum included in the appendix.

Section 4: Transportation Funding and Implementation
The funding and implementation section provides the priority projects and estimated funding the City will have to spend over the life of the plan. On March 22nd and March 29th, a consensus of City Councilors endorsed a prioritized project list that included the following:

- The regionally significant Foothill/N. Phoenix corridor and South Stage overcrossing project
- Engineering staff's recommendations for 36 other projects

At the March 22nd study session, City Council also expressed a strong desire to maintain the current level of service "D", with the exception of two intersections located at Highland and Barnett and at South Pacific Highway and Stewart, (intersection projects I17 and I78, respectively). The City's priority projects to be funded are identified as Tier 1 projects. The remaining unfunded projects are identified as Tier 2.

Staff was asked to evaluate changes to the project list during discussions related to the proposed utility fee increases. Staff's analysis and revised project list is discussed under Project Funding above.

Section 5: Transportation System Plan
This section identifies the different modes served by the transportation system, including everything from cars, bicycles, walking, and the transit system, to the airport, and even pipeline distribution. Details regarding the Tier 1 and Tier 2 projects can be found in this section. The modal plans included in Section 5 provide information pertaining to Streets, Safety, Pedestrians, Bicycles, Transit and Freight. In addition, Section 5 outlines several strategies and projects needed to implement Transportation Demand Management (TDM) strategies, parking management, access management, and other items not addressed in the various modal plans.

In this section, Council can find all of the street cross sections. On January 25, 2018, City Council identified the preferred cross sections for Major and Minor Arterials that provide separated bicycle facilities as the preferred alternative. At that same study session, Council provided direction on the concept of addressing legacy streets. Legacy streets are existing, higher order roadways that do not meet the cross-section standards. Such streets may lack facilities such as vehicle lanes, center turn lanes, sidewalk/planter strips, or bicycle facilities to name a few. The legacy streets information has been updated based on discussions at the June 28th study session. This section introduces this new concept and addresses how the City will handle these streets as development occurs.

Section 6: Key Code and Policy Amendments
The plan includes follow up work that would amend Chapter 10 of the Municipal Code. Any changes within the updated TSP will need to be implemented through revised code language. Some of the amendments include revised parking standards, changes to the review of traffic impact analyses, and updates pertaining to the Transportation Planning Rule. The plan identifies several Oregon Department of Transportation (ODOT) signalized intersections that currently exceed the State's volume to capacity (v/c) ratio or will exceed the v/c in the future. Follow up work with the State and the need to establish alternate mobility standards will also be needed after the adoption of the plan.

Any future code changes will be legislative land use actions that will be reviewed by the Planning Commission and ultimately adopted by City Council. Topics that are outside of the requirements of the Transportation Planning Rule can be addressed at the discretion of the Council when deemed appropriate.

During the June study session, the topic of concurrency was raised. Council agreed with staff's recommendation to adopt the TSP first and address the topic of concurrency separately with help from a stakeholder group. The goal is to

work with the stakeholders to evaluate the current policy and determine whether it works or should be modified. If modifications are suggested, the goal is to adopt changes by the end of this year.

Volume II

Volume II is a list of technical memorandums and data that helped to guide the information in Volume I. It is the appendix and data center for the plan. The following documents are including in Volume II.

Appendix A: Plans and Policies Review	**Appendix G:** 2038 Future Baseline Conditions Figures and Synchro Outputs
Appendix B: Safety Memorandum	**Appendix H:** 2038 Future Mitigated Conditions Figures and Synchro Outputs
Appendix C: Base Year Volumes	**Appendix I:** TPR Checklist
Appendix D: Base Year Conditions Synchro Outputs	**Appendix J:** Functional Classification Memorandum
Appendix E: RVMPO Travel Demand Model Outputs	**Appendix K:** Operations Analysis
Appendix F: Future Volume Post Processing Worksheets	**Attachment A** – Bicycle and Pedestrian Toolkit

If Council is interested in reading any of the above documents, Planning staff can provide them either by e-mail or paper copies.

NEXT STEPS

Staff will present the draft TSP to the JTS/CAC, TAC, and PC at the end of August. One final outreach effort will be organized to let the public review and comment on the draft in late August or early September.

Based on Council input, staff will make final edits to the draft document, including map changes and getting the document and staff report ready to enter the hearing process.

The tentative hearing schedule is as follows:

- Planning Commission (September 27, 2018)
- City Council (October 18, 2018 or November 1, 2018)

EXHIBITS

1.
    a. Scenario 1 Funding Forecast
    b. Scenario 1 Project List
2.
    a. Scenario 2 Funding Forecast
    b. Scenario 2 Project List
    c. Scenario 2 List of Projects *Removed*
3.
    a. Scenario 3 Funding Forecast
    b. Scenario 3 Project List
    c. Scenario 3 List of Projects *Added*
4.
    a. Scenario 4 Funding Forecast
    b. Scenario 4 Project List
    c. Scenario 4 List of Projects *Added*
5.
    a. Scenario 5 Funding Forecast
    b. Scenario 5 Project List
    c. Scenario 5 List of Projects *Added*
6.
    a. Scenario 6 Funding Forecast
    b. Scenario 6 Project List
    c. Scenario 6 List of Projects *Added*
7. Grant Funding History

- Volume I – Transportation System Plan 2018–2038 (paper copy)
- Volume II – Appendix (available upon request)

City of Medford 20-Year Transportation Revenue Estimates

Budget Item	2018-2022	2023-2027	2028-2038
Revenue Estimates			
Existing Revenue Sources:			
State Gas Tax	$ 23,500,000	$ 23,500,000	$ 47,000,000
Street System Development Charges (SDC)	$ 8,750,000	$ 8,750,000	$ 17,500,000
Street Utility Fees	$ 37,000,000	$ 37,000,000	$ 74,000,000
Miscellaneous (CBDG, grants, MURA, etc.)	$ 3,500,000	$ 3,500,000	$ 7,000,000
Total Estimated Revenue from Existing Sources	*$ 72,750,000*	*$ 72,750,000*	*$ 145,500,000*
Anticipated Revenue Sources:			
State Transportation Revenue Increase from HB 2017	$ 6,484,160	$ 9,887,520	$ 20,209,600
Total Estimated Revenues	**$ 79,234,160**	**$ 82,637,520**	**$ 165,709,600**
Fixed Expenditures			
Operating Expenses (staff, indirect, non-road capital)	$ 49,000,000	$ 49,000,000	$ 98,000,000
Maintenance (includes 3% annual increase)	$ 13,272,840	$ 15,386,859	$ 38,516,238
Loan Repayment (Foothill)	$ 5,000,000	$ 5,000,000	
SDC Credits	$ 2,250,000	$ 2,250,000	$ 4,500,000
Contingency	$ 2,965,000		
Total Fixed Expenditures	**$ 72,487,840**	**$ 71,636,859**	**$ 141,016,238**
Balance Available for Capital Street Projects	$ 6,746,320	$ 11,000,661	$ 24,693,362
Fund Balance Carried Forward	$ 30,000,000		
Total Revenue Available for Capital Projects	***$ 36,746,320***	***$ 11,000,661***	***$ 24,693,362***

20-year Total Revenue Available for Capital Projects **$ 72,440,343**

2018-2038 Medford Transportation System Plan Project List - TSP & Utility Fee as Projected

Committed Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
437	Tier 1	Delta Waters Road, Nome Court to Foothill Road	Urban Upgrade	Complete street improvements to Major Collector standard where one or both sides are not already completed	$1,815
413	Tier 1	Columbus Avenue, West McAndrews Road to Sage Road	New Roadway	Realign, extend Columbus Avenue to Sage Rd, and widen to major arterial standard including center-turn lane, bike facilities, and sidewalks	$4,425
				Committed Projects	$6,240

LOS D Citywide

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
469	Tier 1	Foothill Road, Hillcrest Road to McAndrews Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$0
I22	Tier 1	McAndrews Road at Foothill Road Ramps	Intersection	Install traffic signals	-
446	Tier 1	Springbrook Road, Pheasant Lane to Cedar Links Drive	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$0
I26	Tier 1	Springbrook Road & Cedar Links Drive	Intersection	Install roundabout	-
I04	Tier 1	Biddle Road & Lawnsdale Road	Intersection	Update signal phasing and install protected/permitted signal heads in northbound and southbound directions	$160
I12	Tier 1	Crater Lake Avenue & Owens Drive	Intersection	Install traffic signal or roundabout when warranted	$0
I14	Tier 1	Highland Drive & East Main Street	Intersection	Install traffic signal or roundabout when warranted	$0
I15	Tier 1	Hillcrest Road & Pierce Road	Intersection	Install traffic signal or roundabout when warranted	$400
I24	Tier 1	Phoenix Road & Barnett Road	Intersection	Intersection improvements such as second SBTH lane, WBTH lane, and phasing all lefts as perm+prot	$880
I39	Tier 1	Crater Lake Avenue & East Vilas Road	Intersection	Re-align Crater Lake Ave to the east and install traffic signal	$400
I40	Tier 1	Crater Lake Highway & East Vilas Road	Intersection	Monitor needs after construction of Crater Lake Highway Bypass	$5
I45	Tier 1	Foothill Road & Lone Pine Road	Intersection	Intersection control improvements such as right-in/right-out only due to proximity to planned signal at McAndrews ramp - TBD by intersection further analysis and safety analysis	$400
I73	Tier 1	Foothill Road & Delta Waters Road	Intersection	Install turn lanes and traffic signal or roundabout when warranted	$2,200
I75	Tier 1	Valley View Drive & Hillcrest Road	Intersection	Install traffic signal or roundabout when warranted	$2,200
				LOS D Projects	$6,645

LOS E Intersections

I17	Tier 1	South Pacific Highway & Stewart Avenue	Intersection	Intersection improvements such as second southbound left and second eastbound left-turn lanes	$3,000
I78	Tier 1	Highland Drive & Barnett Road	Intersection	Intersection improvements such as second northbound right-turn lane (protected)	$1,500
				LOS E Projects	$4,500

Other Recommended Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
466	Tier 1	Spring Street, Crater Lake Avenue to Sunrise Avenue	Urban Upgrade	Major collector standard including one lane in each direction, center turn-lane, bike facilities, and sidewalks	$4,510
615	Tier 1	Stevens Street, Crater Lake Avenue to Wabash Avenue	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$2,065
475	Tier 1	Coker Butte Road, Crater Lake Avenue to Springbrook Road	New Roadway	Realign and upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks.	$3,400
621	Tier 1	Owen Drive, Springbrook Road to Torrent Street	New Roadway	Construct new major collector roadway (includes center turn-lane, bike facilities, and sidewalks)	$525
I27	Tier 1	Springbrook Road & Spring Street	Intersection	Install traffic signal or roundabout when warranted	$0
606	Tier 1	Kings Highway, South Stage Road to Stewart Avenue	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$8,495
537	Tier 1	South Stage Road, South Pacific Highway to North Phoenix Road	New Roadway	Construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks) and overcrossing of I-5	$15,000
609	Tier 1	Foothill Road, McAndrews Road to Delta Waters Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
610	Tier 1	Foothill Road, Delta Waters Road to North UGB	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
611	Tier 1	North Phoenix Road from Barnett Road to Juanipero Way	Widening	Widen to regional arterial standard including two lanes in each direction, center turn-lane, bike facilities, and sidewalks	
721	Tier 1	North Phoenix Road from Juanipero Way to South Stage	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
708	Tier 1	South Stage Road, City Limits to Orchard Home Drive	New Roadway	Realign S Stage Rd and construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks)	$4,345
I03	Tier 1	12th Street & Riverside Avenue	Intersection	Replace/upgrade traffic signal and increase vertical clearance	$400
447	Tier 1	Table Rock Road, Merriman Road to Interstate 5	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$3,575
490	Tier 1	McAndrews Road, Ross Lane to Jackson Street	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$2,045
I05	Tier 1	Biddle Road & Stevens Street	Intersection	Replace/upgrade traffic signal	$400
I13	Tier 1	Creek View Drive & North Phoenix Road	Intersection	Install traffic signal when warranted. Remove traffic signal at Albertson's access and convert to right-in/right-out only (See SE Plan)	$400
I21	Tier 1	Main Street & Lindley Street	Intersection	Replace/upgrade traffic signal	$400
P20	Tier 1	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$810
P19	Tier 1	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$811
I08	Tier 1	Crater Lake Avenue & Brookhurst Street	Intersection	Replace/upgrade traffic signal to increase vertical clearance and optimize signal timing/phasing	$400
Pr1	Tier 1	Various sidewalk gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Pedestrian	Construct sidewalks or other pedestrian facilities at high-priority locations ($200,000 annually)	$4,000
Pr2	Tier 1	Various bicycle network gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Bicycle	Evaluate and construct potential roadway reconfigurations to accommodate bicycle facilities through re-striping and/or minor reconstruction at high-priority locations ($100,000 annually)	$2,000
Pr3	Tier 1	Signal System Upgrades	Intersection	Upgrade signal controllers to Advanced Traffic Controllers, upgrade communications to signals, and other signal technology upgrades	$1,474
				Other Recommended Projects	$55,055
				Total	**$72,440**
				Available Funding	*$72,440*

Scenario 2

HB 2017 Funds Maintenance
$700,000 Annual Grant Funding

City of Medford 20-Year Transportation Revenue Estimates

Budget Item		2018-2022	2023-2027	2028-2038
Revenue Estimates				
Existing Revenue Sources:				
State Gas Tax		$ 23,500,000	$ 23,500,000	$ 47,000,000
Street System Development Charges (SDC)		$ 8,750,000	$ 8,750,000	$ 17,500,000
Street Utility Fees		$ 37,000,000	$ 37,000,000	$ 74,000,000
Miscellaneous (CBDG, grants, MURA, etc.)		$ 3,500,000	$ 3,500,000	$ 7,000,000
Total Estimated Revenue from Existing Sources		*$ 72,750,000*	*$ 72,750,000*	*$ 145,500,000*
Anticipated Revenue Sources:				
State Transportation Revenue Increase from HB 2017	*(Funds Maint Only)*	$ -	$ -	$ -
Total Estimated Revenues		**$ 72,750,000**	**$ 72,750,000**	**$ 145,500,000**
Fixed Expenditures				
Operating Expenses (staff, indirect, non-road capital)		$ 49,000,000	$ 49,000,000	$ 98,000,000
Maintenance (includes 3% annual increase)		$ 13,272,840	$ 15,386,859	$ 38,516,238
Loan Repayment (Foothill)		$ 5,000,000	$ 5,000,000	
SDC Credits		$ 2,250,000	$ 2,250,000	$ 4,500,000
Contingency		$ 2,965,000		
Total Fixed Expenditures		**$ 72,487,840**	**$ 71,636,859**	**$ 141,016,238**
Balance Available for Capital Street Projects		$ 262,160	$ 1,113,141	$ 4,483,762
Fund Balance Carried Forward		$ 30,000,000		
Total Revenue Available for Capital Projects		***$ 30,262,160***	***$ 1,113,141***	***$ 4,483,762***

20-year Total Revenue Available for Capital Projects **$ 35,859,063**

2018-2038 Medford Transportation System Plan Project List - HB2017 Funds Utility Fee Increases

Committed Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
437	Tier 1	Delta Waters Road, Nome Court to Foothill Road	Urban Upgrade	Complete street improvements to Major Collector standard where one or both sides are not already completed	$1,815
413	Tier 1	Columbus Avenue, West McAndrews Road to Sage Road	New Roadway	Realign, extend Columbus Avenue to Sage Rd, and widen to major arterial standard including center-turn lane, bike facilities, and sidewalks	$4,425
				Committed Projects	$6,240

LOS D Citywide

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
469	Tier 1	Foothill Road, Hillcrest Road to McAndrews Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$0
I22	Tier 1	McAndrews Road at Foothill Road Ramps	Intersection	Install traffic signals	-
446	Tier 1	Springbrook Road, Pheasant Lane to Cedar Links Drive	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center turn lane, bike facilities, and sidewalks	$0
I26	Tier 1	Springbrook Road & Cedar Links Drive	Intersection	Install roundabout	-
I04	Tier 1	Biddle Road & Lawnsdale Road	Intersection	Update signal phasing and install protected/permitted signal heads in northbound and southbound directions	$160
I12	Tier 1	Crater Lake Avenue & Owens Drive	Intersection	Install traffic signal or roundabout when warranted	$0
I14	Tier 1	Highland Drive & East Main Street	Intersection	Install traffic signal or roundabout when warranted	$0
I15	Tier 1	Hillcrest Road & Pierce Road	Intersection	Install traffic signal or roundabout when warranted	$400
I24	Tier 1	Phoenix Road & Barnett Road	Intersection	Intersection improvements such as second SBTH lane, WBTH lane, and phasing all lefts as perm+prot	$880
I39	Tier 1	Crater Lake Avenue & East Vilas Road	Intersection	Re-align Crater Lake Ave to the east and install traffic signal	$400
I40	Tier 1	Crater Lake Highway & East Vilas Road	Intersection	Monitor needs after construction of Crater Lake Highway Bypass	$5
I45	Tier 1	Foothill Road & Lone Pine Road	Intersection	Intersection control improvements such as right-in/right-out only due to proximity to planned signal at McAndrews ramp - TBD by intersection further analysis and safety analysis	$400
I73	Tier 1	Foothill Road & Delta Waters Road	Intersection	Install turn lanes and traffic signal or roundabout when warranted	$2,200
I75	Tier 1	Valley View Drive & Hillcrest Road	Intersection	Install traffic signal or roundabout when warranted	$2,200
				LOS D Projects	$6,645

LOS E Intersections

I17	Tier 1	South Pacific Highway & Stewart Avenue	Intersection	Intersection improvements such as second southbound left and second eastbound left-turn lanes	$3,000
I78	Tier 1	Highland Drive & Barnett Road	Intersection	Intersection improvements such as second northbound right-turn lane (protected)	$1,500
				LOS E Projects	$4,500

Other Recommended Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
I27	Tier 1	Springbrook Road & Spring Street	Intersection	Install traffic signal or roundabout when warranted	$0
537	Tier 1	South Stage Road, South Pacific Highway to North Phoenix Road	New Roadway	Construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks) and overcrossing of I-5	$15,000
609	Tier 1	Foothill Road, McAndrews Road to Delta Waters Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
610	Tier 1	Foothill Road, Delta Waters Road to North UGB	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
611	Tier 1	North Phoenix Road from Barnett Road to Juanipero Way	Widening	Widen to regional arterial standard including two lanes in each direction, center turn-lane, bike facilities, and sidewalks	
721	Tier 1	North Phoenix Road from Juanipero Way to South Stage	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
I03	Tier 1	12th Street & Riverside Avenue	Intersection	Replace/upgrade traffic signal and increase vertical clearance	$400
Pr1	Tier 1	Various sidewalk gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Pedestrian	Construct sidewalks or other pedestrian facilities at high-priority locations ($70,000 annually)	$1,400
Pr2	Tier 1	Various bicycle network gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Bicycle	Evaluate and construct potential roadway reconfigurations to accommodate bicycle facilities through re-striping and/or minor reconstruction at high-priority locations ($35,000 annually)	$700
Pr3	Tier 1	Signal System Upgrades	Intersection	Upgrade signal controllers to Advanced Traffic Controllers, upgrade communications to signals, and other signal technology upgrades	$974
				Other Recommended Projects	$18,474
				Total	**$35,859**
				Available Funding	*$35,859*

2018-2038 Medford Transportation System Plan Project List - HB2017 Funds Utility Fee Increases

Removed Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
466	Tier 2	Spring Street, Crater Lake Avenue to Sunrise Avenue	Urban Upgrade	Major collector standard including one lane in each direction, center turn-lane, bike facilities, and sidewalks	$4,510
615	Tier 2	Stevens Street, Crater Lake Avenue to Wabash Avenue	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$2,065
475	Tier 2	Coker Butte Road, Crater Lake Avenue to Springbrook Road	New Roadway	Realign and upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks.	$3,400
621	Tier 2	Owen Drive, Springbrook Road to Torrent Street	New Roadway	Construct new major collector roadway (includes center turn-lane, bike facilities, and sidewalks)	$525
606	Tier 2	Kings Highway, South Stage Road to Stewart Avenue	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$8,495
708	Tier 2	South Stage Road, City Limits to Orchard Home Drive	New Roadway	Realign S Stage Rd and construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks)	$4,345
447	Tier 2	Table Rock Road, Merriman Road to Interstate 5	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$3,575
490	Tier 2	McAndrews Road, Ross Lane to Jackson Street	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$2,045
I05	Tier 2	Biddle Road & Stevens Street	Intersection	Replace/upgrade traffic signal	$400
I13	Tier 2	Creek View Drive & North Phoenix Road	Intersection	Install traffic signal when warranted. Remove traffic signal at Albertson's access and convert to right-in/right-out only (See SE Plan)	$400
I21	Tier 2	Main Street & Lindley Street	Intersection	Replace/upgrade traffic signal	$400
P20	Tier 2	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$810
P19	Tier 2	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$811
I08	Tier 2	Crater Lake Avenue & Brookhurst Street	Intersection	Replace/upgrade traffic signal to increase vertical clearance and optimize signal timing/phasing	$400
Pr1	Tier 1 Reduced	Various sidewalk gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Pedestrian	Construct sidewalks or other pedestrian facilities at high-priority locations (Reduced by $130,000 annually)	$2,600
Pr2	Tier 1 Reduced	Various bicycle network gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Bicycle	Evaluate and construct potential roadway reconfigurations to accommodate bicycle facilities through re-striping and/or minor reconstruction at high-priority locations (Reduced by $65,000 annually)	$1,300
Pr3	Tier 1 Reduced	Signal System Upgrades	Intersection	Upgrade signal controllers to Advanced Traffic Controllers, upgrade communications to signals, and other signal technology upgrades	$500

Removed Projects	$36,581

City of Medford 20-Year Transportation Revenue Estimates

Budget Item	2018-2022	2023-2027	2028-2038
Revenue Estimates			
Existing Revenue Sources:			
State Gas Tax	$ 23,500,000	$ 23,500,000	$ 47,000,000
Street System Development Charges (SDC)	$ 8,750,000	$ 8,750,000	$ 17,500,000
Street Utility Fees	$ 37,000,000	$ 37,000,000	$ 74,000,000
Miscellaneous (CBDG, grants, MURA, etc.)	$ 15,000,000	$ 15,000,000	$ 30,000,000
Total Estimated Revenue from Existing Sources	*$ 84,250,000*	*$ 84,250,000*	*$ 168,500,000*
Anticipated Revenue Sources:			
State Transportation Revenue Increase from HB 2017	$ 6,484,160	$ 9,887,520	$ 20,209,600
Total Estimated Revenues	**$ 90,734,160**	**$ 94,137,520**	**$ 188,709,600**
Fixed Expenditures			
Operating Expenses (staff, indirect, non-road capital)	$ 49,000,000	$ 49,000,000	$ 98,000,000
Maintenance (includes 3% annual increase)	$ 13,272,840	$ 15,386,859	$ 38,516,238
Loan Repayment (Foothill)	$ 5,000,000	$ 5,000,000	
SDC Credits	$ 2,250,000	$ 2,250,000	$ 4,500,000
Contingency	$ 2,965,000		
Total Fixed Expenditures	**$ 72,487,840**	**$ 71,636,859**	**$ 141,016,238**
Balance Available for Capital Street Projects	$ 18,246,320	$ 22,500,661	$ 47,693,362
Fund Balance Carried Forward	$ 30,000,000		
Total Revenue Available for Capital Projects	***$ 48,246,320***	***$ 22,500,661***	***$ 47,693,362***

20-year Total Revenue Available for Capital Projects **$ 118,440,343**

2018-2038 Medford Transportation System Plan Project List

Committed Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
437	Tier 1	Delta Waters Road, Nome Court to Foothill Road	Urban Upgrade	Complete street improvements to Major Collector standard where one or both sides are not already completed	$1,815
413	Tier 1	Columbus Avenue, West McAndrews Road to Sage Road	New Roadway	Realign, extend Columbus Avenue to Sage Rd, and widen to major arterial standard including center-turn lane, bike facilities, and sidewalks	$4,425
				Committed Projects	$6,240

LOS D Citywide

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
469	Tier 1	Foothill Road, Hillcrest Road to McAndrews Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$0
I22	Tier 1	McAndrews Road at Foothill Road Ramps	Intersection	Install traffic signals	-
446	Tier 1	Springbrook Road, Pheasant Lane to Cedar Links Drive	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$0
I26	Tier 1	Springbrook Road & Cedar Links Drive	Intersection	Install roundabout	-
I04	Tier 1	Biddle Road & Lawnsdale Road	Intersection	Update signal phasing and install protected/permitted signal heads in northbound and southbound directions	$160
I12	Tier 1	Crater Lake Avenue & Owens Drive	Intersection	Install traffic signal or roundabout when warranted	$0
I14	Tier 1	Highland Drive & East Main Street	Intersection	Install traffic signal or roundabout when warranted	$0
I15	Tier 1	Hillcrest Road & Pierce Road	Intersection	Install traffic signal or roundabout when warranted	$400
I24	Tier 1	Phoenix Road & Barnett Road	Intersection	Intersection improvements such as second SBTH lane, WBTH lane, and phasing all lefts as perm+prot	$880
I39	Tier 1	Crater Lake Avenue & East Vilas Road	Intersection	Re-align Crater Lake Ave to the east and install traffic signal	$400
I40	Tier 1	Crater Lake Highway & East Vilas Road	Intersection	Monitor needs after construction of Crater Lake Highway Bypass	$5
I45	Tier 1	Foothill Road & Lone Pine Road	Intersection	Intersection control improvements such as right-in/right out only due to proximity to planned signal at McAndrews ramp - TBD by intersection further analysis and safety analysis	$400
I73	Tier 1	Foothill Road & Delta Waters Road	Intersection	Install turn lanes and traffic signal or roundabout when warranted	$2,200
I75	Tier 1	Valley View Drive & Hillcrest Road	Intersection	Install traffic signal or roundabout when warranted	$2,200
				LOS D Projects	$6,645

LOS E Intersections

I17	Tier 1	South Pacific Highway & Stewart Avenue	Intersection	Intersection improvements such as second southbound left and second eastbound left-turn lanes	$3,000
I78	Tier 1	Highland Drive & Barnett Road	Intersection	Intersection improvements such as second northbound right-turn lane (protected)	$1,500
				LOS E Projects	$4,500

Other Recommended Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
466	Tier 1	Spring Street, Crater Lake Avenue to Sunrise Avenue	Urban Upgrade	Major collector standard including one lane in each direction, center turn-lane, bike facilities, and sidewalks	$4,510
615	Tier 1	Stevens Street, Crater Lake Avenue to Wabash Avenue	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$2,065
475	Tier 1	Coker Butte Road, Crater Lake Avenue to Springbrook Road	New Roadway	Realign and upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks.	$3,400
621	Tier 1	Owen Drive, Springbrook Road to Torrent Street	New Roadway	Construct new major collector roadway (includes center turn-lane, bike facilities, and sidewalks)	$525
I27	Tier 1	Springbrook Road & Spring Street	Intersection	Install traffic signal or roundabout when warranted	$0
606	Tier 1	Kings Highway, South Stage Road to Stewart Avenue	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center turn lane, bike facilities, and sidewalks	$8,495
537	Tier 1	South Stage Road, South Pacific Highway to North Phoenix Road	New Roadway	Construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks) and overcrossing of I-5	$20,130
609	Tier 1	Foothill Road, McAndrews Road to Delta Waters Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
610	Tier 1	Foothill Road, Delta Waters Road to North UGB	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
611	Tier 1	North Phoenix Road from Barnett Road to Juanipero Way	Widening	Widen to regional arterial standard including two lanes in each direction, center turn-lane, bike facilities, and sidewalks	
721	Tier 1	North Phoenix Road from Juanipero Way to South Stage	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
708	Tier 1	South Stage Road, City Limits to Orchard Home Drive	New Roadway	Realign S Stage Rd and construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks)	$4,345
I03	Tier 1	12th Street & Riverside Avenue	Intersection	Replace/upgrade traffic signal and increase vertical clearance	$400
447	Tier 1	Table Rock Road, Merriman Road to Interstate 5	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$3,575
490	Tier 1	McAndrews Road, Ross Lane to Jackson Street	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$2,045
I05	Tier 1	Biddle Road & Stevens Street	Intersection	Replace/upgrade traffic signal	$400
I13	Tier 1	Creek View Drive & North Phoenix Road	Intersection	Install traffic signal when warranted. Remove traffic signal at Albertson's access and convert to right-in/right-out only (See SE Plan)	$400
I21	Tier 1	Main Street & Lindley Street	Intersection	Replace/upgrade traffic signal	$400
P20	Tier 1	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$810
P19	Tier 1	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$811
I08	Tier 1	Crater Lake Avenue & Brookhurst Street	Intersection	Replace/upgrade traffic signal to increase vertical clearance and optimize signal timing/phasing	$400
458	Tier 1	Diamond Street, Columbus Avenue to Kings Highway	Urban Upgrade	Upgrade to major collector standard from McKenzie Drive to Kings Highway, including one lane in each direction, center turn-lane, bike facilities, and sidewalk. Stripe to major collector standard from Columbus Avenue to McKenzie Drive, including one lane in each direction, center turn-lane and bike facilities.	$2,150
460	Tier 1	12th Street, Central Avenue to Cottage Street	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$695
468	Tier 1	Spring Street, Sunrise Avenue to Pierce Road	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$4,210
496	Tier 1	Stewart Avenue, Lozier Lane to Dixie Lane	Urban Upgrade	Upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$2,645
497	Tier 1	Highland Road, Siskyou Boulevard to Keene Way Drive	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$1,135
612	Tier 1	Barneburg Road, Highland Drive to Sunrise Avenue connection	Urban Upgrade	Upgrade to major collector standard from Highland Drive to E. Main Street including one lane in each direction, center-turn lane, bike facilities, and sidewalks and upgrade to minor collector standard from E. Main Street to Sunrise Avenue including one lane in each direction, bike facilities, and sidewalks	$1,985
613	Tier 1	Highland Drive, Keene Drive to Main Street	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$2,810
640	Tier 1	Bullock Road, Crater Lake Highway to Lawnsdale Road	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$4,065
679	Tier 1	Orchard Home Drive, South Stage Road to Cunningham Avenue	Urban Upgrade	Construct new major collector standard (center turn-lane, bike facilities, and sidewalks)	$4,500
680	Tier 1	South Peach Street, Garfield Street to Archer Drive	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$2,875
Pr1	Tier 1	Various sidewalk gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Pedestrian	Construct sidewalks or other pedestrian facilities at high-priority locations ($400,000 annually)	$8,000
Pr2	Tier 1	Various bicycle network gap locations with focus on high priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Bicycle	Evaluate and construct potential roadway reconfigurations to accommodate bicycle facilities through re-striping and/or minor reconstruction at high-priority locations ($200,000 annually)	$4,000
Pr3	Tier 1	Signal System Upgrades	Intersection	Upgrade signal controllers to Advanced Traffic Controllers, upgrade communications to signals, and other signal technology upgrades	$1,474
N/A	Tier 1	Other Intersection Improvements	Intersection	Intersection improvements for locations not elsewhere identified (assumes 3 signals and 3 roundabouts over 20 years)	$7,800
				Other Recommended Projects	$101,055
				Total	**$118,440**
				Available Funding	*$118,440*

2018-2038 Medford Transportation System Plan Project List

Added Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
537	Tier 1	South Stage Road, South Pacific Highway to North Phoenix Road	New Roadway	Construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks) and overcrossing of I-5	$5,130
609	Tier 1	Foothill Road, McAndrews Road to Delta Waters Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
610	Tier 1	Foothill Road, Delta Waters Road to North UGB	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
611	Tier 1	North Phoenix Road from Barnett Road to Juanipero Way	Widening	Widen to regional arterial standard including two lanes in each direction, center turn-lane, bike facilities, and sidewalks	
458	Tier 1	Diamond Street, Columbus Avenue to Kings Highway	Urban Upgrade	Upgrade to major collector standard from McKenzie Drive to Kings Highway, including one lane in each direction, center turn-lane, bike facilities, and sidewalk. Stripe to major collector standard from Columbus Avenue to McKenzie Drive, including one lane in each direction, center turn-lane and bike facilities.	$2,150
460	Tier 1	12th Street, Central Avenue to Cottage Street	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$695
468	Tier 1	Spring Street, Sunrise Avenue to Pierce Road	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$4,210
496	Tier 1	Stewart Avenue, Lozier Lane to Dixie Lane	Urban Upgrade	Upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$2,645
497	Tier 1	Highland Road, Siskyou Boulevard to Keene Way Drive	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$1,135
612	Tier 1	Barneburg Road, Highland Drive to Sunrise Avenue connection	Urban Upgrade	Upgrade to major collector standard from Highland Drive to E. Main Street including one lane in each direction, center-turn lane, bike facilities, and sidewalks and upgrade to minor collector standard from E. Main Street to Sunrise Avenue including one lane in each direction, bike facilities, and sidewalks	$1,985
613	Tier 1	Highland Drive, Keene Drive to Main Street	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$2,810
640	Tier 1	Bullock Road, Crater Lake Highway to Lawnsdale Road	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$4,065
679	Tier 1	Orchard Home Drive, South Stage Road to Cunningham Avenue	Urban Upgrade	Construct new major collector standard (center turn-lane, bike facilities, and sidewalks)	$4,500
680	Tier 1	South Peach Street, Garfield Street to Archer Drive	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$2,875
Pr1	Tier 1	Various sidewalk gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Pedestrian	Construct sidewalks or other pedestrian facilities at high-priority locations (Additional $200,000 annually)	$4,000
Pr2	Tier 1	Various bicycle network gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Bicycle	Evaluate and construct potential roadway reconfigurations to accommodate bicycle facilities through re-striping and/or minor reconstruction at high-priority locations (Additional $100,000 annually)	$2,000
N/A	Tier 1	Other Intersection Improvements	Intersection	Intersection improvements for locations not elsewhere identified (assumes 3 signals and 3 roundabouts over 20 years)	$7,800

Scenario 4

HB 2017 Funds Maintenance
$3,000,000 Annual Grant Funding

City of Medford 20-Year Transportation Revenue Estimates

Budget Item		2018-2022	2023-2027	2028-2038
Revenue Estimates				
Existing Revenue Sources:				
State Gas Tax		$ 23,500,000	$ 23,500,000	$ 47,000,000
Street System Development Charges (SDC)		$ 8,750,000	$ 8,750,000	$ 17,500,000
Street Utility Fees		$ 37,000,000	$ 37,000,000	$ 74,000,000
Miscellaneous (CBDG, grants, MURA, etc.)		$ 15,000,000	$ 15,000,000	$ 30,000,000
Total Estimated Revenue from Existing Sources		*$ 84,250,000*	*$ 84,250,000*	*$ 168,500,000*
Anticipated Revenue Sources:				
State Transportation Revenue Increase from HB 2017	*(Funds Maint Only)*	$ -	$ -	$ -
Total Estimated Revenues		**$ 84,250,000**	**$ 84,250,000**	**$ 168,500,000**
Fixed Expenditures				
Operating Expenses (staff, indirect, non-road capital)		$ 49,000,000	$ 49,000,000	$ 98,000,000
Maintenance (includes 3% annual increase)		$ 13,272,840	$ 15,386,859	$ 38,516,238
Loan Repayment (Foothill)		$ 5,000,000	$ 5,000,000	
SDC Credits		$ 2,250,000	$ 2,250,000	$ 4,500,000
Contingency		$ 2,965,000		
Total Fixed Expenditures		**$ 72,487,840**	**$ 71,636,859**	**$ 141,016,238**
Balance Available for Capital Street Projects		$ 11,762,160	$ 12,613,141	$ 27,483,762
Fund Balance Carried Forward		$ 30,000,000		
Total Revenue Available for Capital Projects		***$ 41,762,160***	***$ 12,613,141***	***$ 27,483,762***

20-year Total Revenue Available for Capital Projects **$ 81,859,063**

2018-2038 Medford Transportation System Plan Project List

Committed Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
437	Tier 1	Delta Waters Road, Nome Court to Foothill Road	Urban Upgrade	Complete street improvements to Major Collector standard where one or both sides are not already completed	$1,815
413	Tier 1	Columbus Avenue, West McAndrews Road to Sage Road	New Roadway	Realign, extend Columbus Avenue to Sage Rd, and widen to major arterial standard including center-turn lane, bike facilities, and sidewalks	$4,425
				Committed Projects	$6,240

LOS D Citywide

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
469	Tier 1	Foothill Road, Hillcrest Road to McAndrews Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$0
I22	Tier 1	McAndrews Road at Foothill Road Ramps	Intersection	Install traffic signals	-
446	Tier 1	Springbrook Road, Pheasant Lane to Cedar Links Drive	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$0
I26	Tier 1	Springbrook Road & Cedar Links Drive	Intersection	Install roundabout	-
I04	Tier 1	Biddle Road & Lawnsdale Road	Intersection	Update signal phasing and install protected/permitted signal heads in northbound and southbound directions	$160
I12	Tier 1	Crater Lake Avenue & Owens Drive	Intersection	Install traffic signal or roundabout when warranted	$0
I14	Tier 1	Highland Drive & East Main Street	Intersection	Install traffic signal or roundabout when warranted	$0
I15	Tier 1	Hillcrest Road & Pierce Road	Intersection	Install traffic signal or roundabout when warranted	$400
I24	Tier 1	Phoenix Road & Barnett Road	Intersection	Intersection improvements such as second SBTH lane, WBTH lane, and phasing all lefts as perm+prot	$880
I39	Tier 1	Crater Lake Avenue & East Vilas Road	Intersection	Re-align Crater Lake Ave to the east and install traffic signal	$400
I40	Tier 1	Crater Lake Highway & East Vilas Road	Intersection	Monitor needs after construction of Crater Lake Highway Bypass	$5
I45	Tier 1	Foothill Road & Lone Pine Road	Intersection	Intersection control improvements such as right-in/right-out only due to proximity to planned signal at McAndrews ramp - TBD by intersection further analysis and safety analysis	$400
I73	Tier 1	Foothill Road & Delta Waters Road	Intersection	Install turn lanes and traffic signal or roundabout when warranted	$2,200
I75	Tier 1	Valley View Drive & Hillcrest Road	Intersection	Install traffic signal or roundabout when warranted	$2,200
				LOS D Projects	$6,645

LOS E Intersections

I17	Tier 1	South Pacific Highway & Stewart Avenue	Intersection	Intersection improvements such as second southbound left and second eastbound left-turn lanes	$3,000
I78	Tier 1	Highland Drive & Barnett Road	Intersection	Intersection improvements such as second northbound right-turn lane (protected)	$1,500
				LOS E Projects	$4,500

Other Recommended Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
466	Tier 1	Spring Street, Crater Lake Avenue to Sunrise Avenue	Urban Upgrade	Major collector standard including one lane in each direction, center turn-lane, bike facilities, and sidewalks	$4,510
615	Tier 1	Stevens Street, Crater Lake Avenue to Wabash Avenue	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$2,065
475	Tier 1	Coker Butte Road, Crater Lake Avenue to Springbrook Road	New Roadway	Realign and upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks.	$3,400
621	Tier 1	Owen Drive, Springbrook Road to Torrent Street	New Roadway	Construct new major collector roadway (includes center turn-lane, bike facilities, and sidewalks)	$525
I27	Tier 1	Springbrook Road & Spring Street	Intersection	Install traffic signal or roundabout when warranted	$0
606	Tier 1	Kings Highway, South Stage Road to Stewart Avenue	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$8,495
537	Tier 1	South Stage Road, South Pacific Highway to North Phoenix Road	New Roadway	Construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks) and overcrossing of I-5	$15,000
609	Tier 1	Foothill Road, McAndrews Road to Delta Waters Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
610	Tier 1	Foothill Road, Delta Waters Road to North UGB	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
611	Tier 1	North Phoenix Road from Barnett Road to Juanipero Way	Widening	Widen to regional arterial standard including two lanes in each direction, center turn-lane, bike facilities, and sidewalks	
721	Tier 1	North Phoenix Road from Juanipero Way to South Stage	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
708	Tier 1	South Stage Road, City Limits to Orchard Home Drive	New Roadway	Realign S Stage Rd and construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks)	$4,345
I03	Tier 1	12th Street & Riverside Avenue	Intersection	Replace/upgrade traffic signal and increase vertical clearance	$400
447	Tier 1	Table Rock Road, Merriman Road to Interstate 5	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$3,575
490	Tier 1	McAndrews Road, Ross Lane to Jackson Street	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$2,045
I05	Tier 1	Biddle Road & Stevens Street	Intersection	Replace/upgrade traffic signal	$400
I13	Tier 1	Creek View Drive & North Phoenix Road	Intersection	Install traffic signal when warranted. Remove traffic signal at Albertson's access and convert to right-in/right-out only (See SE Plan)	$400
I21	Tier 1	Main Street & Lindley Street	Intersection	Replace/upgrade traffic signal	$400
P20	Tier 1	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$810
P19	Tier 1	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$811
I08	Tier 1	Crater Lake Avenue & Brookhurst Street	Intersection	Replace/upgrade traffic signal to increase vertical clearance and optimize signal timing/phasing	$400
460	Tier 1	12th Street, Central Avenue to Cottage Street	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$695
468	Tier 1	Spring Street, Sunrise Avenue to Pierce Road	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$4,210
496	Tier 1	Stewart Avenue, Lozier Lane to Dixie Lane	Urban Upgrade	Upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$2,645
Pr1	Tier 1	Various sidewalk gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Pedestrian	Construct sidewalks or other pedestrian facilities at high-priority locations ($300,000 annually)	$6,000
Pr2	Tier 1	Various bicycle network gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Bicycle	Evaluate and construct potential roadway reconfigurations to accommodate bicycle facilities through re-striping and/or minor reconstruction at high-priority locations ($100,000 annually)	$2,000
Pr3	Tier 1	Signal System Upgrades	Intersection	Upgrade signal controllers to Advanced Traffic Controllers, upgrade communications to signals, and other signal technology upgrades	$1,343
				Other Recommended Projects	$64,474
				Total	**$81,859**
				Available Funding	*$81,859*

2018-2038 Medford Transportation System Plan Project List					
Added Projects					
Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
460	Tier 1	12th Street, Central Avenue to Cottage Street	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$695
468	Tier 1	Spring Street, Sunrise Avenue to Pierce Road	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$4,210
496	Tier 1	Stewart Avenue, Lozier Lane to Dixie Lane	Urban Upgrade	Upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$2,645
Pr1	Tier 1	Various sidewalk gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Pedestrian	Construct sidewalks or other pedestrian facilities at high-priority locations (Additional $100,000 annually)	$2,000
Pr3	Tier 1	Signal System Upgrades	Intersection	Upgrade signal controllers to Advanced Traffic Controllers, upgrade communications to signals, and other signal technology upgrades	($131)

City of Medford 20-Year Transportation Revenue Estimates

Budget Item	2018-2022	2023-2027	2028-2038
Revenue Estimates			
Existing Revenue Sources:			
State Gas Tax	$ 23,500,000	$ 23,500,000	$ 47,000,000
Street System Development Charges (SDC)	$ 8,750,000	$ 8,750,000	$ 17,500,000
Street Utility Fees	$ 37,000,000	$ 37,000,000	$ 74,000,000
Miscellaneous (CBDG, grants, MURA, etc.)	$ 7,500,000	$ 7,500,000	$ 15,000,000
Total Estimated Revenue from Existing Sources	*$ 76,750,000*	*$ 76,750,000*	*$ 153,500,000*
Anticipated Revenue Sources:			
State Transportation Revenue Increase from HB 2017	$ 6,484,160	$ 9,887,520	$ 20,209,600
Total Estimated Revenues	**$ 83,234,160**	**$ 86,637,520**	**$ 173,709,600**
Fixed Expenditures			
Operating Expenses (staff, indirect, non-road capital)	$ 49,000,000	$ 49,000,000	$ 98,000,000
Maintenance (includes 3% annual increase)	$ 13,272,840	$ 15,386,859	$ 38,516,238
Loan Repayment (Foothill)	$ 5,000,000	$ 5,000,000	
SDC Credits	$ 2,250,000	$ 2,250,000	$ 4,500,000
Contingency	$ 2,965,000		
Total Fixed Expenditures	**$ 72,487,840**	**$ 71,636,859**	**$ 141,016,238**
Balance Available for Capital Street Projects	$ 10,746,320	$ 15,000,661	$ 32,693,362
Fund Balance Carried Forward	$ 30,000,000		
Total Revenue Available for Capital Projects	***$ 40,746,320***	***$ 15,000,661***	***$ 32,693,362***

20-year Total Revenue Available for Capital Projects **$ 88,440,343**

2018-2038 Medford Transportation System Plan Project List

Committed Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
437	Tier 1	Delta Waters Road, Nome Court to Foothill Road	Urban Upgrade	Complete street improvements to Major Collector standard where one or both sides are not already completed	$1,815
413	Tier 1	Columbus Avenue, West McAndrews Road to Sage Road	New Roadway	Realign, extend Columbus Avenue to Sage Rd, and widen to major arterial standard including center turn lane, bike facilities, and sidewalks	$4,425
				Committed Projects	$6,240

LOS D Citywide

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
469	Tier 1	Foothill Road, Hillcrest Road to McAndrews Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$0
I22	Tier 1	McAndrews Road at Foothill Road Ramps	Intersection	Install traffic signals	-
446	Tier 1	Springbrook Road, Pheasant Lane to Cedar Links Drive	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$0
I26	Tier 1	Springbrook Road & Cedar Links Drive	Intersection	Install roundabout	-
I04	Tier 1	Biddle Road & Lawnsdale Road	Intersection	Update signal phasing and install protected/permitted signal heads in northbound and southbound directions	$160
I12	Tier 1	Crater Lake Avenue & Owens Drive	Intersection	Install traffic signal or roundabout when warranted	$0
I14	Tier 1	Highland Drive & East Main Street	Intersection	Install traffic signal or roundabout when warranted	$0
I15	Tier 1	Hillcrest Road & Pierce Road	Intersection	Install traffic signal or roundabout when warranted	$400
I24	Tier 1	Phoenix Road & Barnett Road	Intersection	Intersection improvements such as second SBTH lane, WBTH lane, and phasing all lefts as perm+prot	$880
I39	Tier 1	Crater Lake Avenue & East Vilas Road	Intersection	Re-align Crater Lake Ave to the east and install traffic signal	$400
I40	Tier 1	Crater Lake Highway & East Vilas Road	Intersection	Monitor needs after construction of Crater Lake Highway Bypass	$5
I45	Tier 1	Foothill Road & Lone Pine Road	Intersection	Intersection control improvements such as right-in/right-out only due to proximity to planned signal at McAndrews ramp - TBD by intersection further analysis and safety analysis	$400
I73	Tier 1	Foothill Road & Delta Waters Road	Intersection	Install turn lanes and traffic signal or roundabout when warranted	$2,200
I75	Tier 1	Valley View Drive & Hillcrest Road	Intersection	Install traffic signal or roundabout when warranted	$2,200
				LOS D Projects	$6,645

LOS E Intersections

I17	Tier 1	South Pacific Highway & Stewart Avenue	Intersection	Intersection improvements such as second southbound left and second eastbound left-turn lanes	$3,000
I78	Tier 1	Highland Drive & Barnett Road	Intersection	Intersection improvements such as second northbound right-turn lane (protected)	$1,500
				LOS E Projects	$4,500

Other Recommended Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
466	Tier 1	Spring Street, Crater Lake Avenue to Sunrise Avenue	Urban Upgrade	Major collector standard including one lane in each direction, center turn-lane, bike facilities, and sidewalks	$4,510
615	Tier 1	Stevens Street, Crater Lake Avenue to Wabash Avenue	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$2,065
475	Tier 1	Coker Butte Road, Crater Lake Avenue to Springbrook Road	New Roadway	Realign and upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks.	$3,400
621	Tier 1	Owen Drive, Springbrook Road to Torrent Street	New Roadway	Construct new major collector roadway (includes center turn-lane, bike facilities, and sidewalks)	$525
I27	Tier 1	Springbrook Road & Spring Street	Intersection	Install traffic signal or roundabout when warranted	$0
606	Tier 1	Kings Highway, South Stage Road to Stewart Avenue	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$8,495
537	Tier 1	South Stage Road, South Pacific Highway to North Phoenix Road	New Roadway	Construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks) and overcrossing of I-5	$15,000
609	Tier 1	Foothill Road, McAndrews Road to Delta Waters Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
610	Tier 1	Foothill Road, Delta Waters Road to North UGB	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
611	Tier 1	North Phoenix Road from Barnett Road to Juanipero Way	Widening	Widen to regional arterial standard including two lanes in each direction, center turn-lane, bike facilities, and sidewalks	
721	Tier 1	North Phoenix Road from Juanipero Way to South Stage	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
708	Tier 1	South Stage Road, City Limits to Orchard Home Drive	New Roadway	Realign S Stage Rd and construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks)	$4,345
I03	Tier 1	12th Street & Riverside Avenue	Intersection	Replace/upgrade traffic signal and increase vertical clearance	$400
447	Tier 1	Table Rock Road, Merriman Road to Interstate 5	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$3,575
490	Tier 1	McAndrews Road, Ross Lane to Jackson Street	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$2,045
I05	Tier 1	Biddle Road & Stevens Street	Intersection	Replace/upgrade traffic signal	$400
I13	Tier 1	Creek View Drive & North Phoenix Road	Intersection	Install traffic signal when warranted. Remove traffic signal at Albertson's access and convert to right-in/right-out only (See SE Plan)	$400
I21	Tier 1	Main Street & Lindley Street	Intersection	Replace/upgrade traffic signal	$400
P20	Tier 1	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$810
P19	Tier 1	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$811
I08	Tier 1	Crater Lake Avenue & Brookhurst Street	Intersection	Replace/upgrade traffic signal to increase vertical clearance and optimize signal timing/phasing	$400
460	Tier 1	12th Street, Central Avenue to Cottage Street	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$695
468	Tier 1	Spring Street, Sunrise Avenue to Pierce Road	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$4,210
496	Tier 1	Stewart Avenue, Lozier Lane to Dixie Lane	Urban Upgrade	Upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$2,645
640	Tier 1	Bullock Road, Crater Lake Highway to Lawnsdale Road	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$4,065
680	Tier 1	South Peach Street, Garfield Street to Archer Drive	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$2,875
Pr1	Tier 1	Various sidewalk gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Pedestrian	Construct sidewalks or other pedestrian facilities at high-priority locations ($250,000 annually)	$5,000
Pr2	Tier 1	Various bicycle network gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Bicycle	Evaluate and construct potential roadway reconfigurations to accommodate bicycle facilities through re-striping and/or minor reconstruction at high-priority locations ($100,000 annually)	$2,000
Pr3	Tier 1	Signal System Upgrades	Intersection	Upgrade signal controllers to Advanced Traffic Controllers, upgrade communications to signals, and other signal technology upgrades	$1,984
				Other Recommended Projects	$71,055
				Total	**$88,440**
				Available Funding	*$88,440*

2018-2038 Medford Transportation System Plan Project List					
Added Projects					
Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
460	Tier 1	12th Street, Central Avenue to Cottage Street	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$695
468	Tier 1	Spring Street, Sunrise Avenue to Pierce Road	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$4,210
496	Tier 1	Stewart Avenue, Lozier Lane to Dixie Lane	Urban Upgrade	Upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$2,645
640	Tier 1	Bullock Road, Crater Lake Highway to Lawnsdale Road	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$4,065
680	Tier 1	South Peach Street, Garfield Street to Archer Drive	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$2,875
Pr1	Tier 1	Various sidewalk gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Pedestrian	Construct sidewalks or other pedestrian facilities at high-priority locations (Additional $50,000 annually)	$1,000
Pr3	Tier 1	Signal System Upgrades	Intersection	Upgrade signal controllers to Advanced Traffic Controllers, upgrade communications to signals, and other signal technology upgrades	$510

City of Medford 20-Year Transportation Revenue Estimates

Budget Item		2018-2022	2023-2027	2028-2038
Revenue Estimates				
Existing Revenue Sources:				
State Gas Tax		$ 23,500,000	$ 23,500,000	$ 47,000,000
Street System Development Charges (SDC)		$ 8,750,000	$ 8,750,000	$ 17,500,000
Street Utility Fees		$ 37,000,000	$ 37,000,000	$ 74,000,000
Miscellaneous (CBDG, grants, MURA, etc.)		$ 7,500,000	$ 7,500,000	$ 15,000,000
Total Estimated Revenue from Existing Sources		*$ 76,750,000*	*$ 76,750,000*	*$ 153,500,000*
Anticipated Revenue Sources:				
State Transportation Revenue Increase from HB 2017	*(Funds Maint Only)*	$ -	$ -	$ -
Total Estimated Revenues		**$ 76,750,000**	**$ 76,750,000**	**$ 153,500,000**
Fixed Expenditures				
Operating Expenses (staff, indirect, non-road capital)		$ 49,000,000	$ 49,000,000	$ 98,000,000
Maintenance (includes 3% annual increase)		$ 13,272,840	$ 15,386,859	$ 38,516,238
Loan Repayment (Foothill)		$ 5,000,000	$ 5,000,000	
SDC Credits		$ 2,250,000	$ 2,250,000	$ 4,500,000
Contingency		$ 2,965,000		
Total Fixed Expenditures		**$ 72,487,840**	**$ 71,636,859**	**$ 141,016,238**
Balance Available for Capital Street Projects		$ 4,262,160	$ 5,113,141	$ 12,483,762
Fund Balance Carried Forward		$ 30,000,000		
Total Revenue Available for Capital Projects		***$ 34,262,160***	***$ 5,113,141***	***$ 12,483,762***

20-year Total Revenue Available for Capital Projects **$ 51,859,063**

2018-2038 Medford Transportation System Plan Project List

Committed Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
437	Tier 1	Delta Waters Road, Nome Court to Foothill Road	Urban Upgrade	Complete street improvements to Major Collector standard where one or both sides are not already completed	$1,815
413	Tier 1	Columbus Avenue, West McAndrews Road to Sage Road	New Roadway	Realign, extend Columbus Avenue to Sage Rd, and widen to major arterial standard including center-turn lane, bike facilities, and sidewalks	$4,425
				Committed Projects	$6,240

LOS D Citywide

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
469	Tier 1	Foothill Road, Hillcrest Road to McAndrews Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	$0
I22	Tier 1	McAndrews Road at Foothill Road Ramps	Intersection	Install traffic signals	-
446	Tier 1	Springbrook Road, Pheasant Lane to Cedar Links Drive	Urban Upgrade	Upgrade to major collector standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$0
I26	Tier 1	Springbrook Road & Cedar Links Drive	Intersection	Install roundabout	-
I04	Tier 1	Biddle Road & Lawnsdale Road	Intersection	Update signal phasing and install protected/permitted signal heads in northbound and southbound directions	$160
I12	Tier 1	Crater Lake Avenue & Owens Drive	Intersection	Install traffic signal or roundabout when warranted	$0
I14	Tier 1	Highland Drive & East Main Street	Intersection	Install traffic signal or roundabout when warranted	$0
I15	Tier 1	Hillcrest Road & Pierce Road	Intersection	Install traffic signal or roundabout when warranted	$400
I24	Tier 1	Phoenix Road & Barnett Road	Intersection	Intersection improvements such as second SBTH lane, WBTH lane, and phasing all lefts as perm+prot	$880
I39	Tier 1	Crater Lake Avenue & East Vilas Road	Intersection	Re-align Crater Lake Ave to the east and install traffic signal	$400
I40	Tier 1	Crater Lake Highway & East Vilas Road	Intersection	Monitor needs after construction of Crater Lake Highway Bypass	$5
I45	Tier 1	Foothill Road & Lone Pine Road	Intersection	Intersection control improvements such as right-in/right-out only due to proximity to planned signal at McAndrews ramp - TBD by intersection further analysis and safety analysis	$400
I73	Tier 1	Foothill Road & Delta Waters Road	Intersection	Install turn lanes and traffic signal or roundabout when warranted	$2,200
I75	Tier 1	Valley View Drive & Hillcrest Road	Intersection	Install traffic signal or roundabout when warranted	$2,200
				LOS D Projects	$6,645

LOS E Intersections

I17	Tier 1	South Pacific Highway & Stewart Avenue	Intersection	Intersection improvements such as second southbound left and second eastbound left-turn lanes	$3,000
I78	Tier 1	Highland Drive & Barnett Road	Intersection	Intersection improvements such as second northbound right-turn lane (protected)	$1,500
				LOS E Projects	$4,500

Other Recommended Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
615	Tier 1	Stevens Street, Crater Lake Avenue to Wabash Avenue	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike facilities, and sidewalks	$2,065
621	Tier 1	Owen Drive, Springbrook Road to Torrent Street	New Roadway	Construct new major collector roadway (includes center turn-lane, bike facilities, and sidewalks)	$525
I27	Tier 1	Springbrook Road & Spring Street	Intersection	Install traffic signal or roundabout when warranted	$0
606a	Tier 1	Kings Highway, Garfield St to Stewart Avenue	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$3,000
537	Tier 1	South Stage Road, South Pacific Highway to North Phoenix Road	New Roadway	Construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks) and overcrossing of I-5	$15,000
609	Tier 1	Foothill Road, McAndrews Road to Delta Waters Road	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
610	Tier 1	Foothill Road, Delta Waters Road to North UGB	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
611	Tier 1	North Phoenix Road from Barnett Road to Juanipero Way	Widening	Widen to regional arterial standard including two lanes in each direction, center turn-lane, bike facilities, and sidewalks	
721	Tier 1	North Phoenix Road from Juanipero Way to South Stage	Urban Upgrade	Upgrade to regional arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks	
I03	Tier 1	12th Street & Riverside Avenue	Intersection	Replace/upgrade traffic signal and increase vertical clearance	$400
447	Tier 1	Table Rock Road, Merriman Road to Interstate 5	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$3,575
I13	Tier 1	Creek View Drive & North Phoenix Road	Intersection	Install traffic signal when warranted. Remove traffic signal at Albertson's access and convert to right-in/right-out only (See SE Plan)	$400
I21	Tier 1	Main Street & Lindley Street	Intersection	Replace/upgrade traffic signal	$400
P20	Tier 1	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$810
P19	Tier 1	Southeast Medford	Bicycle/Pedestrian	Construct Multi-Use Path	$811
Pr1	Tier 1	Various sidewalk gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Pedestrian	Construct sidewalks or other pedestrian facilities at high-priority locations ($200,000 annually)	$4,000
Pr2	Tier 1	Various bicycle network gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas	Bicycle	Evaluate and construct potential roadway reconfigurations to accommodate bicycle facilities through re-striping and/or minor reconstruction at high-priority locations ($100,000 annually)	$2,000
Pr3	Tier 1	Signal System Upgrades	Intersection	Upgrade signal controllers to Advanced Traffic Controllers, upgrade communications to signals, and other signal technology upgrades	$1,488
				Other Recommended Projects	$34,474
				Total	**$51,859**
				Available Funding	*$51,859*

2018-2038 Medford Transportation System Plan Project List

Removed Projects

Project #	Tier	Project Location	Project Type	Project Description	Cost ($1,000)
466	Tier 2	Spring Street, Crater Lake Avenue to Sunrise Avenue	Urban Upgrade	Major collector standard including one lane in each direction, center turn-lane, bike facilities, and sidewalks	$4,510
475	Tier 2	Coker Butte Road, Crater Lake Avenue to Springbrook Road	New Roadway	Realign and upgrade to major arterial standard including two lanes in each direction, center-turn lane, bike facilities, and sidewalks.	$3,400
606b	Tier 2	Kings Highway, South Stage Road to Garfield St	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$5,495
708	Tier 2	South Stage Road, City Limits to Orchard Home Drive	New Roadway	Realign S Stage Rd and construct new minor arterial roadway (includes center turn-lane, bike facilities, and sidewalks)	$4,345
490	Tier 2	McAndrews Road, Ross Lane to Jackson Street	Urban Upgrade	Upgrade to minor arterial standard including one lane in each direction, center-turn lane, bike facilities, and sidewalks	$2,045
I05	Tier 2	Biddle Road & Stevens Street	Intersection	Replace/upgrade traffic signal	$400
I08	Tier 2	Crater Lake Avenue & Brookhurst Street	Intersection	Replace/upgrade traffic signal to increase vertical clearance and optimize signal timing/phasing	$400
				Removed Projects	$20,595

Grant Funding History
City of Medford Public Works

Year	Agency	Description	Project	Amount	Project #	IGA
2004	State	OTIA Local Bridge Program	McAndrews Bridge Replacement	$ 7,554,000	CT0557	21504
2004	State	OTIA Local Bridge Program	Barnette Bridge	$ 8,346,000	CT0554	21504
2007	Federal	STIP/CMAQ	Owens Drive/Coker Butte	$ 3,484,200	CA1542	23589/26854
2007	Federal	SAFETEA-LU	Various Schools	$ 3,491,964	CV	23187
2007	Federal	CMAQ	Mace Rd.: Howard Elem. Sidewalk	$ 457,624	CD1535	24111
2010	Federal	CMAQ/STP	Garfield; Columbus to Lillian	$ 1,905,529	CA1778	27326
2010	State	Mutual Maintenance	Flexible Service Maintenance	$ 500,000	Ops	26601
2011	Federal	ARRA - CMAQ	BC Greenway: Barnett to Blue Heron	$ 2,328,700	CT0625	25515
2011	Federal	CMAQ	Jackson/Stevens Alleys	$ 1,183,538	M0609	25149
2012	Federal	Federal Hwy Admin	Larson Creek Trail-Greenway to Ellendale	$ 540,000	CY0640 STP0653530	28259
2013	Federal	Highway RR Crossing Program	3rd Street Railroad Crossing	$ 127,440	M0646	28980
2014	Federal	Connect Oregon Grant	Larson Creek Segment 2	$ 868,000	CY0653	30143
2015	State	CMAQ	Foothill Rd.	$ 3,000,000	P1825	26803
2015	State/ Federal	CMAQ/STIP/MTEP	Lozier Lane Improvements	$ 6,729,955	CA1806 STA1806550	28298
2015	State	Jurisdictional Transfer-Maint	Crater Lake Ave. and Owen/Coker	$ 250,000	Ops	28665
2017	Federal	HSIP/ ARTS		$ 1,123,945		31801

Total Grant Funding Since 2004 **$ 41,890,895**

City of Medford

Bicycle and Pedestrian Advisory Committee

MEMORANDUM

Subject	Incorporation of NACTO's "Designing for All Ages and Abilities Bicycle Facilities" into the Medford TSP Goals and Objectives
To	Mayor and City Council
	TSP Citizen Advisory Committee
	Brian Sjothun, City Manager
From	City of Medford Bicycle and Pedestrian Advisory Committee (BPAC)
	Joseph Smith, Chair
Date	May 14, 2018

During last month's Bicycle and Pedestrian Advisory Committee Meeting, Gary Shaff of the Siskiyou Velo gave a presentation on the National Association of City Transportation Officials (NACTO)'s ***All Ages & Abilities*** criteria for selecting and implementing bike facilities. The major theme of this document was that a City providing streets that are safe and comfortable for bicyclists of all ages and abilities are critical for attracting wide ridership. ***All Ages & Abilities*** bike facilities are safe, comfortable and equitable. More people will bicycle when they have safe places to ride, and more riders mean safer streets. Bikeways that provide comfortable, low-stress bicycling conditions can achieve widespread growth in mode share. High-quality bikeways expand opportunities to ride and encourage safe riding.

The Medford Bicycle and Pedestrian Advisory Committee supports the City's incorporation of ***Action Item 11-e*** in the **TSP's Goals & Objectives**. This action item facilitates a review of the National Association of City Transportation Officials ***Designing for All Ages & Abilities Bicycle Facilities*** document (December 2017) when considering the installation of bicycle facilities.

EXHIBIT F

Citizen E-mails

Support for All Ages and Abilities Bicycle Facilities

Below is the template e-mail submitted to the Planning Department and the City Council supporting All Ages and Abilities Bicycle Facilities. In some of the e-mails additional text was provided by the sender. The names of those in favor of these designs plus any additional comments added are provided below.

To: Medford City Council and Medford Transportation Department

I'm writing to urge you to support "All Ages and Abilities" bicycle facility designs.

The City's updated Transportation System Plan should include a commitment to design, fund, and construct "All Ages and Abilities" bicycle facilities and to complete the bicycle transportation network by 2038. Some of the benefits include:
1) improved citizen health through active transportation,
2) less motor vehicle congestion,
3) greater community livability arising from traffic-calmed neighborhoods,
4) fewer consumer dollars spent on expensive gasoline, and
5) reduced climate changing emissions.

It is not acceptable to rely upon bike lanes. They are too dangerous for most citizens to use effectively, except on low volume, low speed streets. People riding bikes should be able to enjoy a "safe and convenient" transportation network equal to the one provided for motor vehicle drivers.

Please include my email as a part of the transportation plan adoption record.

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Names and Comments from those who submitted e-mails.

	Name	Additional Comments (if provided)
1.	Arguelle, Floberto	
2.	Baker, Ranie	I have been run off the road by cars while bicycling... i have two small children with whom I'd love to ride bikes in town, but it just doesn't feel safe
3.	Baker, Keith	Scared to death to ride a bike Medford.
4.	Barker, Greg	I do most of bike riding in Medford
5.	Bartels, Gernot	Please create bikeways separated from motor vehicle traffic along routes where the speed limit is greater than 30 mph. Thank you
6.	Bartloff, Jennifer	As a bicycle commuter and exerciser, I recognize that one of the draws of this valley is the biking: this is currently due to the climate and beauty, making riding rewarding and possible year-round. Unfortunately, the road conditions are extremely dangerous for cyclists. I have had many friends hit, harassed, or sideswiped by motorists. Local government should support initiatives to improve community safety and healthy behaviors. Supporting and facilitating bicycle riding will be a huge benefit to this community.
7.	Berlet, Richard	
8.	Bittner, Harlan	I'd especially like to see safer bike facilities for children, for example neighborhood bikeways that have very low traffic volumes and low speeds, or separated bikeways.
9.	Blue, Amiko-Gabriel	
10.	Bosbach, Crystal	I am 68 and ride my bike to Medford via the green way several times a year. Once on city roads in Medford there are many places where the bike paths seem to dissapear in spots. I feel unsafe to ride in crowded traffic. Seperate bike paths are my preference but 48 to 60 inch width continuous paths on the streets would make me much more comfortable than the current situation. Thank you.
11.	Bosbach, Stephen	
12.	Bourne, Jared	Let's face it, people need a safe way to commute, we're a growing city, and I feel it's time we accommodate the growth. I personally commute daily, and I think there are many places we could use improvement. Thank you for all the work you are currently doing.
13.	Bove, Scott	
14.	Boyle, Andrea	Cars drive too fast and close to me when I'm out riding. I have tried the Bear Creek Greenway, but it is poorly maintained with holes and tree roots pushing up the

		pavement, as well as dodging homeless people and drug dealers. Two years ago, after falling off my bike to avoid a hole in the road (2 months after my 2nd knee replacement) I gave up riding in Medford as it is just too unsafe for an older person to ride a bike. I hope this can be addressed in the near future. In the meantime, I guess I will consider taking my bike to Eugene or similar.
15.	Breithaupt, Wayne	
16.	Brill, Lisa	I was riding on a busy street, no bike lane. A woman in a parked car to my right opened her door in front of me and I rode into it. A car to the left of me had to slam on the brakes to avoid me as I went over the handle bars and her door. Four stitches and a bump on my head.
17.	Brindley, Harry	Dedicated, separate and safe bike lanes please — no white striped lanes on roads with motorized vehicles.
18.	Brown, Adam	
19.	Busby, Ed	I've been riding my bike in Medford and roads of Jackson County for over 45 years, and very pleased to see increased safety for cyclist being considered in roadway design and improvements. All Ages and Abilities will continue this trend, truly making cycling a safer and more viable mode of transportation for everyone in Medford.
20.	Castellanos, Dawn	My husband and I love to ride our bikes. Unfortunately, I can't tell you the number of times we have been crowded by angry drivers. It would be wonderful to have a bit of a buffer.
21.	Clinkinbeard, Kent	As a Medford resident who regularly travels by bike in and around the city, I want to express my appreciation for the bicycle amenities currently available. I firmly believe encouraging local citizens to travel by bike is a positive for the city, the environment, and for the rider. I urge Medford city planners to continue including the use of bicycles as an essential part of future transportation planning.
22.	Cochran, Carol	I feel unsafe riding downtown or on busy streets
23.	Conway, Kathy	We can be a real leader by including this in the City's Transportation system Plan.
24.	Cordray, Randy	I moved to the beautiful Rogue Valley specifically because of the cycling opportunities afforded by our local communities and the wonderful terrain and views to be found. The urban area that I escaped from had far too much traffic and associated danger to comfortably ride a bike. I truly love this valley but I'm troubled by the apparent neglect that our county and city managers exhibit towards cyclists. This includes, but is not limited to: the lack of dedicated bike

		lanes, and the complete lack of regard for cyclists when it comes to re-paving projects. It seems that the concept of a road having a "shoulder" is completely off the engineering and execution plans whenever a road is re-paved or chip-sealed. Please, on behalf of the large and dedicated cycling community here (and the cycling tourists who come here to spend their time and dollars!) I implore you all to consider the concept of safe and ride-able shoulders to our local roads. Thanks for your time, sincerely.< br />
25.	Corelis, Steven	
26.	Cramer, Dennis	As an avid rider, I get out most days. I ride on many of the roads that are not condusive to the average rider. I have also taken my grandchildren onto some roads near me and you have to be very careful due to no bike lanes or busy traffic. Many people won't venture out onto the roads at all for fear of traffic or not enough separation from cars. Any improvement to enhance the safety of bicycle riders would help get some of these people out to utilize their bikes.
27.	Currer, Peter	I do ride through Medford from time to time, some areas are very well done but many streets are very dangerous.
28.	Demarinis, Susan	I would love it if there was some way to make the bike path safe under the bridges and overpasses. If there were daily police patrols to clear out the homeless campers, I would probably ride through Medford more. It also would be great if there was a definitive bike lane on Pacific Hwy 99, especially north of the RV Mall.
29.	Denton, Michael	I ride daily and carry a mini baseball bat to protect me from the drivers who doesn't pay attention.. gentle tap will work wonders. They do scare me!!
30.	Dittmer, Eric	
31.	DiVita, Dianne	
32.	Dressler, Robin	I have been "nearly" hit a couple of times while riding around town. This is despite wearing neon clothes and using LED lights front and back. Well nearly might not sound significant, it was due to my actions that I wasn't hit not the drivers. I have also been yelled at by drivers going the opposite direction while I am writing as far as safely possible next to the shoulder on old stage with statements like, "you're going to get someone killed." since I am likely the one to be killed this statement is somewhat incongruent. These sorts of incidents make it very daunting for beginning riders to enjoy our beautiful valley on the roads that are supposed to support us all.

33.	Dwyer, Karen	Have encountered unsafe bikes lanes due to grates, potholes, cars and garbage cans in bike lane. I feel more public education about bike rights and laws is very important.
34.	Foster, Holly	A lot has changed since I started cycling in the Rogue Valley in 1980. The Greenway, "road diet" areas, and new bike lanes have improved safety for cyclists. At the same time, traffic has increased dramatically, which, along with the advent of cell phones - despite laws against their use while driving - has made sharing the road with cars more dangerous than ever. As I enter my 60s I want to feel safe as I continue to cycle for transportation, health, and pleasure.
35.	Fuhrman, Patricia	I'm a senior citizen living in Ashland who still bicycles. Please keep our roadways safe for all.
36.	Fuhrman, Pat	We especially need more people to exercise and get out of their cars. Thank you.
37.	Gagnon, Phil	As an 87 yr. old, experienced cyclist, I see more electric bicyclists shooting around our towns and suspect more to come. It's likely many of them, perhaps new to cycling, may be in danger of driving their bikes in unsafe areas. Question: Should our towns take notice of the increase in bicyclists in general and make safe roadways now unsafe? If not now, when?
38.	Garrard, John	
39.	Gilmore, Paul	I would ride to work more and decongest the car traffic a bit if there were more bike lanes.
40.	Girard, Steve	Medford, in general, lacks safe cycling corridors. In particular through business areas where people would like to be able to safely commute to and from work. The Greenway is a cesspool of junkies, tweajers, and aggressive homeless, it is an extremely unsafe area. I have found needles there on nearly every outing that I have attempted to use the path. The crime rate in Medford is outrageous, even with proper infrastructure for cycling, I would not feel safe leaving my bike locked up anywhere in town, as it would surely be stolen. Quite frankly, I make every effort to avoid riding any where near the City of Medford for fear of my property and safety.
41.	Gray, Frank	Not enough bike lanes. Bike lanes end abruptly. Always crap in the bike lanes so you have to ride in the road.
42.	Griffen, Tiffani	I drive a car, but if the roads and drivers were safer, I'd love to use my bike to commute to work.
43.	Gunter, Amy	As a bike commuter, parent, business ownerland use

		planner, I encourage Medford to do more for bicycles and pedestrians.
44.	Hacker, Kathy	My husband & I moved to Southern Oregon from bike friendly Tucson, AZ. We would definitely ride in the metro area if we felt it was safe to ride there.
45.	Hagerman, Eric	I bicycle in Medford frequently, but would do so more if the streets were safer. Rough, narrow streets with a high volume of car traffic force many bicycles onto the sidewalk which makes it dangerous for pedestrians, as well as cyclists. One of my pet peeves is the nice bicycle lanes which end suddenly and dump the rider onto one of those narrow, rough, dangerous roads. Please do not create bike lanes that lead the rider into a dangerous situation - that seems like treachery of the worse sort. I know its all about funding; you have to take the money when it is offered, but please be aware of the consequences to riders of all ages and abilities when a bike lane ends in a situation which can lead to injury, or at least frustrated, slower traffic.
46.	Hammond, Marty	
47.	Harris, John	Anything you can do to make cycling safer for everyone, juniors and seniors, is good for everyone.
48.	Hoeper, Frank	Please consider incorporating "All Ages and All Abilities" into Medford's Transportation System Plan. It would be a tool that planner could use to help plan projects into the future for the benefit of all city residents, not just cyclists, because vehicle trips would be reduced andair quality improved, just to name a few benefits. Adoption would not force planners to build separated bike lanes where they will not "fit" into rights of way. Think of it as a planning tool to improve the cycling infrastructure where appropriate.
49.	Honsinger, Patrick	19 years ago I moved my family to P
50.	Hubbard, Frank	I am an avid biker and have been for 30+ years. Furthermore, I am a retired surgeon who had significant experience in trauma. For the health of our inexperienced cyclists (youth and older folk) please support “All Ages and Abilities”. Thank you!
51.	Huffman, Carol	I have been biking for about 5 years and have appreciated the bike lanes that have been included on our local streets and highways. Thank you for supporting our safety.
52.	Janeway, Gus	If a city's planning is ultimately intended to promote the health, happiness, welfare and economic success of its citizens, investing in safe multi-modal transportation for people of all ages and abilities is one of the simplest ways to

		achieve these goals.
53.	Jones, Rachel	
54.	Karetnick, Benjamin	I am a cancer patient who cannot drive and counts on utilizing my bicycle for daily transportation: I hope to be a part of making Medford a safer place for everyone to ride their bicycles!
55.	Kinsinger, Bobbie	I'm over 75 and appreciate the areas where we can bike safely. We need more.
56.	Klouda, Gary	I have found it is much safer to ride on some of the Medford streets that have beeen upgraded with designated bike lanes. Please consider supporting the "All ages and Abilities" designs for bicycle facilities. It will be greatly appreciated by current cyclists and future citizens that seek a healthy activity for either transportation or exercise.
57.	Koehler, Eckhard	Bicycle safety promotes local business and community health. I've seen this living in both Boulder and Denver Colorado.
58.	Kolczynski, Phillip	I chose to start cycling in my retirement; the Rogue Valley is a wonderful place to retire, Medford should support cycling for all ages and abilities. Recently USA today claimed that Medford is not a good place to raise children -- obviously a poorly researched article, especially in terms of recreational opportunities. The next time a major newspaper reports on Medford provide a basis for them to point out how Medford has become a cycling mecca for all ages.
59.	Luther, Donald	My wife will only ride on paths where there is no reasonable possibility that she may be hit by a car, so the only way to ride with her is to partially disassemble the bicycles and put them in the car and drive to the Bear Creek Greenway. Needless to say, we don't get to bike often.
60.	Lynn, Sheri	
61.	MacKenzie, Evan	I am a "strong and fearless" rider and I do not feel safe riding in Medford. Many of the bike lanes in Medford are well below the minimum accepted width of 5 feet. The "sharrows" on Central and Riverside do not belong on Arterials - they should only be used on Local streets. I have shared the roundabout at Sikiyou and Highland with cars at least five times. I was hit by a parent dropping a kid off at Hughes Elementary who veered into and then stopped in the bike lane. I've had many other close calls, all in less than a year. And there are too many homeless people on the Bear Creek Greenway for most people to feel safe, especially women.

62.	Mallette, Ray	I currently use my bikes in lieu of a second car for transportation, shopping, errands and exercise. I encourage you to consider improving the 'bikeabily' of Medford to increase safety, connectivity and growth of bike transportation. This can be accomplished by committing to follow the 'All Ages and Abilities' toolbox methods when building or improving bike infrastructure. A significant growth in the number of residents who would bike on the Medford streets and parks will greatly enhance the livability of the city.
63.	McCoy, James	
64.	McKinley, Doug	I ride a recumbent tricycle and there is nowhere in Medford that I can ride safely!
65.	McKinley, Richard	I am a 60-year old native of the rogue Valley, and have enjoyed bicycling since my youth. Sadly, the poor quality of available, and safe, bike routes in the Medford city infrastructure has greatly limited my opportunities. The current bike lanes often end at very busy locations with no viable options. To encourage cycling, which would improve the livability of Medford, I encourage the City Council to adopt a more bike friendly transportation plan.
66.	Miller, Julia	
67.	Minton II, Richard	As a bike rider and a driver in the city of Medford I have experienced a high level of frustration by drivers from the behavior
68.	Mobley, Tim	Medford is the perfect city for bike safe lanes to move about. The current traffic patterns keep me far away on my bike rides
69.	Moore, ML	I am a recreational rider and like to ride through Medford regularly to visit various shops and businesses.
70.	Moran, Mark	I am confident that improved bike facilities will greatly enhance the attractiveness of the rogue valley as a place to visit and even move to. Giving families the facilities to ride together as well as assisting work
71.	Morse, Daniel	
72.	Moseman, Liam	Been hit by a car with no resolve in Medford. Now I want safer bikeing routes!
73.	Mueller, Tysen	
74.	Murillo, Virginia	
75.	Niehaus, Vern	
76.	Nix, Crystal	
77.	O'Neal, Nancy	As a local trauma surgeon and cyclist, I take care of too many

		of our bicycling public in the ER. The city should commit to a safer cycling policy.
78.	Penner, Heather	
79.	Pew, Jacob	
80.	Pickett, Blaine	Improving Medford's bike infrastructure would greatly increase the number of people riding bikes in Medford. This would then improve the economic outlook for Medford. I hear from many people throughout the year that will ride the bike path from Ashland to Bear Creek Park and then turn around because Medford is not a nice place to ride a bike. These are people that would have gone shopping or stopped for lunch but decide to stop in one of the other towns between Ashland and Medford. Creating a bike route around the city with separated bike lanes so residents can access most of the city in a safe manner. These routes could be a block or two off the main streets with easy access to business.
81.	Purkerson, L. Lee	Some bicycle riders are afraid to ride in Medford.
82.	DiVita, Richard	
83.	Bittner, Rebecca	The Rogue Valley is a beautiful place to bicycle. All ages and abilities should be able to enjoy it!
84.	Reynolds, Jennifer	
85.	Rider, Bruce	
86.	Ruby, Dan	
87.	Sawyer, Jake	
88.	Schack, Barbara	I am only an occasional bike rider. However, with separate and safe facilities, I'm sure I'd be much more willing to use a bicycle as an alternate means of transportation. Please support All Ages and All Abilities facilities.
89.	Seaman, Chris	
90.	Seaman, Amy	
91.	Shaff, Gary	The draft TSP effectively discriminates against seniors, families, youth, and people with disabilities. The Oregon Constitution prohibits discrimination and ORS 659A.006, Declaration of policy against unlawful discrimination, provides: (1) It is declared to be the public policy of Oregon that practices of unlawful discrimination against any of its inhabitants because of race, color, religion, sex, sexual orientation, national origin, marital status, age, disability or familial status are a matter of state concern and that this discrimination not only threatens the rights and privileges of its inhabitants but menaces the institutions and foundation of a free democratic state. (2) The opportunity to obtain

		employment or housing or to use and enjoy places of public accommodation without unlawful discrimination because of race, color, religion, sex, sexual orientation, national origin, marital status, age or disability hereby is recognized as and declared to be a civil right. A place of public accommodation is defined by 659A.400 as follows: (a) Any place or service offering to the public accommodations, advantages, facilities or privileges whether in the nature of goods, services, lodgings, amusements, transportation or otherwise. (b) Any place that is open to the public and owned or maintained by a public body, as defined in ORS 174.109, regardless of whether the place is commercial in nature. (c) Any service to the public that is provided by a public body, as defined in ORS 174.109, regardless of whether the service is commercial in nature.
92.	Shand, Bob	OUR YOUTH OUR FUTURE
93.	Sheets, Thomas	Bicycling is healthy!
94.	Shirley, Keith	
95.	Simmons, Michele	Such a beautiful area ...but nowhere for a family to enjoy it on a bike. So many close calls for those people who dare to venture out from Jacksonville to Medford.
96.	Smith, Ann	For the past five years I have been bike commuting 2.5 miles to my workplace along Crater Lake Hwy between Delta Waters and Northgate Marketplace at Hwy 99. I moved here because I wanted to live in a place that was safer to choose cycling as a primary means of transportation. To say that my commute is hazardous and uncomfortable is an understatement. I have longed hoped that it would get better over the years and with the bypass in the works, ODOT had a golden opportunity to fix the problem. Instead all we got was fresh pavement and paint for a bike lane along a heavily trafficked, high speed (yeah, don't talk to me about "speed limits") multi-lane highway that is unprotected and already filled with debris. What a waste. The thing about bike lanes in Medford is that often they don't even meet the standards set by the state for width, they are placed in areas that are inappropriate, they don't accompany traffic calming, and they lack continuity. Medford should be working with the state and county to at least build new infrastructure in a way that actually increases safety and reduces conflicts as opposed to creating conflicts and ignoring safety.
97.	Smith, Joseph	
98.	Smith, Steve	One thing I am concerned about is the presence of low

		barriers along bike paths that confine bikes to the path. Without being to cross the lane boundary, bikes are unable to avoid hazards within the bike path such as dog walkers, joggers with loud music in earbuds, and worst of all, bikes riding the wrong way. Such a barrier does very little to prevent a car from crossing into the bike lane, so it is a rather false sense of security. Finally, if you don't sweep the bike paths, we can't use them.
99.	Spano, Shane	The area is very bicycle unfriendly. I know at least a hundred people who would commute by bike or ride a bike for errands, etc , They have told me they are afraid to for fear of getting hit by a car.
100.	Spittle, Reg	I ride in Medford regularly and our community must provide safe bicycle access for adults and our children.
101.	Strahm, Richard	One of the most common complaints about bicycle riders is that they don't follow basic traffic rules. I think the solution to this is more bicycle facilities--lanes, signage, even separate bike signals like they have in other towns. And why not repaint the bike restriction notices on the sidewalks downtown. The higher the visibility of the bicycling transportation sector, the more seriously all modes, including the cyclists, will take us. Bicycles are transportation, they deserve a place on the road, if not a separate road for themselves, and they have the obligation to follow the rules. So please build--and standardize--our paths and facilities. Thank you.
102.	Stuart, Deb	I can't get to the bike path except by going down Barnett where there are no bike lanes. Please help.
103.	Stubbins, Patrick	
104.	Suarez, Isabel	Hi, I would like to bicycle more often for multiple reasons (environment, traffic, enjoyment, health, etc.) but I don't feel safe riding on street with traffic. We need more bicycle paths with physical barriers between cars and bicycles.
105.	Taylor, Rick	
106.	Thorndike, Dan	
107.	Miller, Trevor	
108.	Vigil, Trisha	Also, please keep the bicycle lanes free of debris (stones, glass, etc). This is a real problem. Thank you.
109.	Weaver, Geoff	Let's make the Rogue Valley bike friendly, and begin reducing the unnecessary vehicular smog in our valley
110.	Webb, Robbin	We all need mutual encouragement to be healthy .I would love to ride my bike to more occasions, meetings, and running chores, but it is too scary in downtown Medford. I

		appreciated bike lanes whenever I stumble across one. We need more. Please plan for our future.
111.	Weber, Gregory	It's great that we have a Greenway for exercise and pleasure. It would be much better to be able to ride safely through and around town.
112.	Wessler, Betsy	
113.	Wetzel, Sandra	
114.	White, Gordon	
115.	Wilkey, Chris	
116.	Wohlfahrt, Dubravko	
117.	Wood, Eric	
118.	Zamm, Josh	
119.	Zell, Elizabeth	
120.	Zentgraf, Tony	Please consider improvements in cyclone for all ages. There have been times when I was riding in the road and drivers have come close to hitting me. Also there are many east to west roads that do not have an acceptable room for bikes. It would be easier to crossover to the other side of town to bike. Thanks
121.	Symons, Tom	Things are getting better but more needs to be done to educate drivers on sharing the road and educating riders on the correct side of the road.
122.	Roberts, Jeff	
123.	Goldfein, Bonnie	
124.	Buckley, Jon	
125.	Howard-Bullen, Martha	
126.	Moser, Teri	My family and I enjoyed bike rides for many years. As an "older" resident of Medford, I would find it way too dangerous to go out on bike ride any more.
127.	Icki Harris	
128.	O, Steve	Medford is really dangerous for cycling. To determine the right thing to do see Portland and Ashland.

EXHIBIT G

Hi Matt,

Please forward the attached testimony to the City's Planning Commission at your earliest convenience.

I also want to say "thank you" to you and your staff for your generosity throughout 2018. You have facilitated Velo's presentation of the NACTO guide to the City's advisory committees, provided data, generously gave of your time, and were always pleasant to work with. You have helped to make our involvement, as volunteers and advocates, a rewarding one. I only wish the information that we have shared over the last ten months had been more fully integrated into the draft TSP.

I remain optimistic that Siskiyou Velo's efforts and our testimony will ultimately ensure the City's construction, within the current planning horizon, of a viable, safe, and convenient bicycle transportation system for all. That is, after all, what the Oregon transportation planning rule requires.

Thanks again,
Gary Shaff

Testimony for the City of Medford draft Transportation System Plan

(CP-16-036)

Planning Commission Public Hearing

October 11, 2018

Submitted

By

Bike Club

&

Harlan Bittner, citizen / individual
Jeff Roberts, citizen / individual
Gary Shaff, citizen / individual

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Exhibit 1 – NACTO – Contextual Guidance for Selecting All Ages and Abilities Bikeways
Exhibit 2 – Portland's Safe and Convenient Bicycle Facility Network (1980 – 2010)
Exhibit 3 - Change in Demand with Safe and Convenient Bike Facilities (before and after experience)

Introduction

This testimony is submitted by Siskiyou Velo, the local bike club in the Rogue Valley. We have advocated for the City to provide safe and convenient bicycle facilities for all residents. To this end, we have made numerous presentations to civic groups and have met with City officials throughout 2018 in an attempt to ensure that the City's bicycle transportation system in 2038 will, in fact, meet the requirements of the Oregon Transportation Planning Rule (TPR), Chapter 660.

The City's Transportation System Plan – Update (TSP—Update) fails to incorporate the requirements of the TPR to create a viable bicycle transportation network. The TPR has been in effect since 1991 and while there have been amendments to the Rule, it has always required all cities and counties within metropolitan planning organizations to make changes to their existing transportation system "to enhance, promote and facilitate safe and convenient … bicycle travel" (OAR 660-12-0000(3)(a) .

Over the years, Medford has added many miles of bike lanes on its arterial and collector streets. Presumably, this was in response to OAR 660-12-0045(3)(b) which states "**bikeways** shall be required along arterials and major collectors" (emphasis added). The City, in contrast to the TPR requirement, has utilized bike lanes as a "one- size-fits-all" improvement ignoring other TPR requirements including OAR 600-12-0045(3)(d)(A), which requires that **bike facilities** (emphasis added) be "reasonably free from hazards, particularly types or levels of automobile traffic which would interfere with or discourage … cycle travel for short trips."

As a consequence of the City's policy, the existing bicycle transportation system is largely unusable by the majority of people who might otherwise choose to bicycle if the system were, as required by the TPR, "safe and convenient." A survey conducted by the City in August 2017 (Medford Transportation Survey, question 17) found that over 50% of residents ride bikes, but only about 6% feel safe and confident riding on city streets. The TSP – Update refers to these people as "strong and fearless" or "enthused and confident.

Figure 1 (draft TSP, Figure 10) indicates level of stress (L or LTS) for existing bicycle facilities in Medford. Only Level 1 stress bike facilities, it should be noted, can be used by people of all ages and abilities. There are no existing collector or arterial streets shown on Figure 1 with L1 or L2 stress. There are future streets planned for Level 2 stress—generally, L2 stress facilities can accommodate most adults of ages 18-64.

All of the City's collector and arterial streets are either L3 or L4, which are considered unsafe for everyone. The current bicycle network on arterial and collector streets, then, completely excludes children, seniors and families. Analysis of Fig 1 also indicates that riding a bicycle from anywhere to anywhere in Medford is almost impossible on L1 stress facilities—thus excluding vast numbers of all people (including commuters, shoppers, people going to medical appointments, etc.) from riding safely and conveniently in Medford.

The TSP—Update validates these findings, noting on page 34 "that many streets, with bicycle lanes, still result in [high] LTS [Level of Traffic Stress] 3 or 4 … due to the speed of adjacent traffic." Thus the City's existing bicycle transportation system is not "reasonably free from hazards," a TPR required standard for bicycle facilities (see OAR 660-12-0045(3)(d)(A).

Figure 1

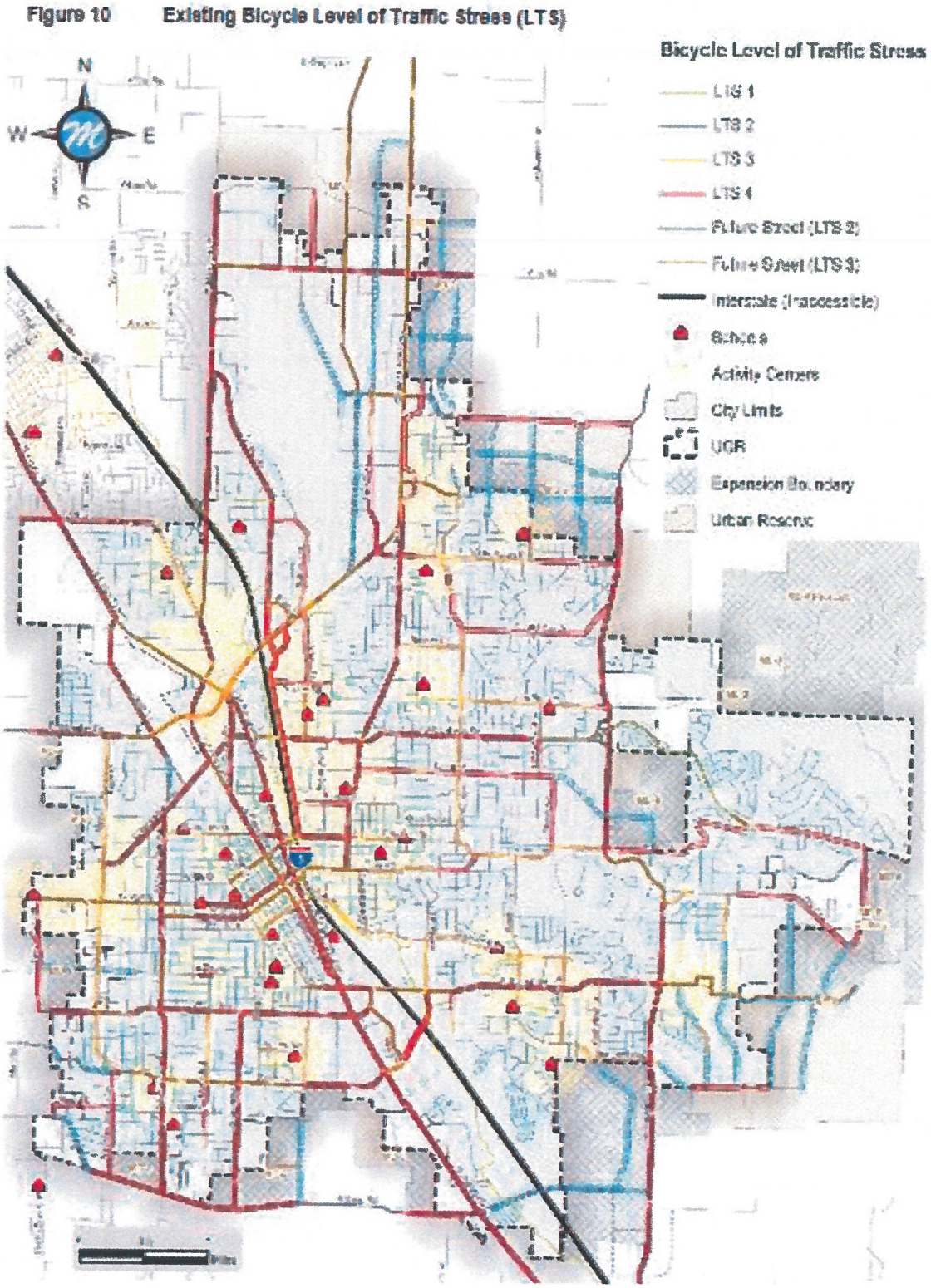


Figure 10 Existing Bicycle Level of Traffic Stress (LTS)
N
W
E
S
Bicycle Level of Traffic Stress
LTS 1
LTS 2
LTS 3
LTS 4
Future Street (LTS 2)
Future Street (LTS 3)
Interstate (Inaccessible)
Schools
Activity Centers
City Limits
UGR
Expansion Boundary
Urban Reserve

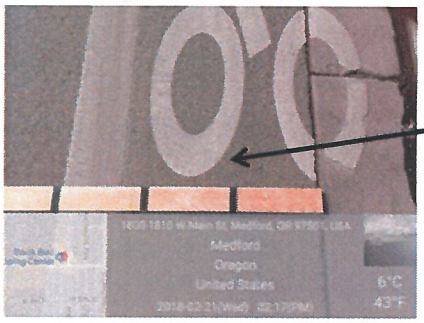
Further compounding the issue is the City's historic construction of overly narrow bike lanes on most of its arterial and collector streets. The problem is illustrated in Figure 2. Many of the bike lanes on major (arterial and collector) streets do not meet the City's street standards, which require 5' wide bike lanes except on major arterials, where 6' wide bike lanes are required. The resulting close proximity of bicycles and traffic results in higher Levels of Stress on many streets than indicated in Figure 1. The TSP--Update does not include any description of the LTS methodology but it likely relied upon the flawed inventory indicated here.

Figure 2

Too Narrow Bike Lanes

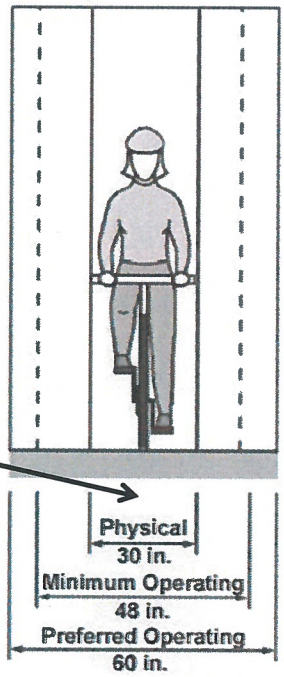
Medford, like the rest of the RVMPO cities, have focused almost exclusively on adding bike lanes on major streets (arterial and collector streets). **The City's efforts have often lead to overly narrow lanes for bikes** despite the City's street standards which require five feet wide bike lanes except on major arterials where the City's code* requires bike lanes to be six feet wide (both measures include the width of the drain pan).

* Source: http://www.ci.medford.or.us/codeprint.asp?codeid=4426)



Riding a Bicycle Should Not Require Bravery

Two and one-half feet wide. That is too narrow for safety or comfort.



Source: 2012 AASHTO Bike Guide

The TSP does call for a bicycle network that is safe for everyone (TSP--Update, Vision, Goal 1, Objective 1, 2, and 3 as examples). Yet, the draft TSP sets LTS 2, only suitable for adults, as the future standard for bicycle improvements.

It is also notable that there are no bike facility "safety" improvements listed in the TSP despite the City's acknowledgement that the existing bicycle transportation system is unsafe for the majority of its citizens. For existing bicycle safety deficiencies, the draft TSP update merely states that these "will be considered when improving or retrofitting roadways" (TSP--Update, page 34).

Siskiyou Velo urges the City to state in the TSP explicit requirements for bicycle facilities that are safe and convenient for all citizens. The National Association of Transportation Officials (NACTO) standards are explicit (see Exhibit 1, attached), and should form the basis for the bike facility requirements in the TSP-Update. Though the NACTO document is referenced as an action

item in the TSP-Update, a simple reference to that document is not sufficient. Furthermore, the wide discretion afforded in the TSP--Update in terms of cross-section selection and treatment of legacy streets is unlikely to result in an adequate bicycle network for all citizens.

Our review, attached, finds that the City's draft TSP does not meet the following TPR requirements.

1) OAR 660-12-0000(3)(c)
2) OAR 660-12-0020(3)(b) and (d)
3) OAR 660-12-0035(4) – (6)
4) OAR 660-12-0045(3)(d)(A) – (C).

The draft plan also would also discriminate against selected portions of the City's and region's population and thus undermine protections included in the Oregon Constitution and ORS 659A.006.

Please instruct the City's staff to modify the TSP--Update to ensure that the bicycle transportation system is safe and can serve everyone by the year 2038. Thank you.

Harlan Bittner
President, Siskiyou Velo

Harlan Bittner
Citizen

Gary Shaff
Board Member, Siskiyou Velo

Gary Shaff
citizen

Jeff Roberts
Board Member, Siskiyou Velo

Jeff Roberts
citizen

Failure 1
OAR 660-012-0035 subsection (7) Evaluation and Selection of Transportation System Alternatives requires: "Regional and local TSPs shall include benchmarks to assure satisfactory progress towards meeting the approved standard or standards adopted pursuant to this rule at regular intervals over the planning period. MPOs and local governments shall evaluate progress in meeting benchmarks at each update of the regional transportation plan. Where benchmarks are not met, the relevant TSP shall be amended to include new or additional efforts adequate to meet the requirements of this rule."

The table below details the Rogue Valley Metropolitan Area's failure to meet the adopted "Measure 1" benchmark - "the percentage of total daily trips taken by a combination of bicycle and walking (non-motorized) modes…" The percentage of bike/pedestrian mode share has remained unchanged since the year 2000 at 8.2 percent, and the transit mode share is lagging behind its 2015 benchmark.

Table 1.2 – Measure 1: Transit & Bike/Ped Mode Share 2010 Benchmark Analysis

Measure	How Measured	2000	Benchmark 2005	Measured 2007	Benchmark 2010	Measured 2014	Benchmark 2015	Target 2020
Measure 1: Transit and Bicycle/Pedestrian Mode Share	The percent of total daily trips taken by transit and combination of bicycle and walking (non-motorized) modes. Determined from best available data (e.g., model output and/or transportation survey data).	% Daily Trips	% Daily Trips	% Daily Trips	% Daily Trips	% Daily Trips	% Daily Trips	% Daily Trips
		Transit: 1.0 Bike/Ped: 8.2	Transit: 1.0 Bike/Ped: 8.2	Transit: 0.9 Bike/Ped: 7.3	Transit: 1.0 Bike/Ped: 8.4	Transit: 1.45 Bike/Ped: 8.20	Transit: 2.2 Bike/Ped: 9.8	Transit: 3.0 Bike/Ped: 11

Source: Alternative Measures Report, Rogue Valley MPO, 2015

Benchmark 3 established standards for the construction of bike facilities on arterial and collector streets. According the 2015 RVMPO report, the RVMPO has exceeded the benchmark.

Table 3.1 – Measure 3: Percentage of Arterials/Collectors with Bicycle Facilities 2010 Benchmark Analysis

Measure	How Measured	2000	Benchmark 2005	Measured 2007	Benchmark 2010	Measured 2014	Benchmark 2015	Target 2020
Measure 3: % Collectors and arterials w/bicycle facilities	Determined through GIS mapping	21%	25%	27%	37%	28%	48%	60%

Source: Alternative Measures Report, Rogue Valley MPO, 2015

A 2017 update and review of the 2015 benchmark analysis found errors in the 2014 analysis. "Results of this analysis show that **28%** of arterials and collectors within the RVMPO have facilities for bicyclists that meet the criteria described above. This number is below the 2015 benchmark of 48%." (4/20/18 email and attachment, Andrea Napoli, RVMPO – available upon request). The draft TSP does not include this updated information.

2017 Update of Benchmark Analysis – Measure #3

Table 3.0: Benchmarks, 20-Year Target, and Results of Analyses for Measure #3

MEASURE	Baseline 2000	Benchmark 2005	*Measured 2007*	Benchmark 2010	*Measured 2014*	Benchmark 2015	*Measured 2017*	20-Yr Target 2020
Measure 3: % Collectors / Arterials w/ Bicycle Facilities	21%	28%	37%	37%	54%	48%	28%	60%

TPR requirement 660-12-0035(4) reads "In MPO areas, regional and local TSPs shall be designed to achieve adopted standards for increasing transportation choices and reducing reliance on the automobile. Adopted standards are intended as means of measuring progress of metropolitan areas towards developing and implementing transportation systems and land use plans that increase transportation choices and reduce reliance on the automobile. It is anticipated that metropolitan areas will accomplish reduced reliance by changing land use patterns and transportation systems so that walking, cycling, and use of transit are highly convenient and so that, on balance, people need to and are likely to drive less than they do today."

Recent data shows that Medford residents are becoming more dependent upon the use of automobiles to get to work based upon recent statistics from the US Census Bureau, American Community Survey. In 2010, 77.8 of Medford residents drove alone to work while in 2016 the number had increased to 78.8 of all workers.

Portland, as a frame of reference, has increased bicycle mode share from one percent (the historic and existing mode share for bicycles in the Medford) in 1990 to 6.1 percent in 2010 by constructing a combination of off-street trails, bike boulevards, and separated in-roadway bicycle facilities. Portland's TSP provides for a 25% bike mode share by 2035. (See Exhibit 2, attached).

The assumptions used as a part of Measure 1 are incorporated into and directly impact the future year travel demand forecast. A higher alternative mode share has the effect of reducing forecast motor vehicle travel demand (i.e. needs). The resulting output from the transportation model output are used together with existing roadway capacities to identify roadway improvement needs.

An unrealistically low alternative mode share translates into a higher overall need for roadway and intersection improvements. Consequently, the transportation needs and "demand-to-capacity ratios … included in Volume II of the TSP" (draft TSP, page 23) are overstated and result in more roadway improvements than necessary. "Transportation Needs" as the term is used in the TPR "means estimates of the movement of people and goods consistent with acknowledged comprehensive plan and the requirements of this rule. Needs are typically based on projections of future travel demand resulting from a continuation of current trends as modified by policy objectives, including those expressed in Goal 12 and this rule, especially those for avoiding principal reliance on any one mode of transportation." (emphasis added) The absurdly low alternative mode share, as expressed in Measure 1, is a policy objective and makes the travel demand forecasts developed as a part of the draft TSP of questionable value.

Conclusion 1a: The updated TSP does not satisfy the requirements of OAR 660-012-0035(4). The City's TSP presents the existing benchmarks but does not acknowledge that they have not been met, nor does the City offer updated benchmarks to achieve the requirements of the TPR a requirement of OAR 660-12-0035(7)..

Conclusion 1b: The existing Measure 1 objectives are far too low to achieve the requirement of OAR 660-12-0035(4). A modest and achievable goal bike mode share in 2038 would be 10 percent.

Conclusion 1c: The local Measure 1 benchmark as adopted, even if achieved, would not significantly reduce reliance on the automobile. The combined pedestrian and bicycle mode share should be above 20 percent of achieve the requirements of the TPR, especially the requirement to achieve "a reduction in reliance on single occupant automobile use." (OAR 660-12-0000(3)c). Based upon the experience of other areas that have constructed "all ages and abilities" bicycle networks, a bike mode share in Medford can easily achieve 10 percent (see Exhibit 3) provided the bicycle network is "safe and convenient."

Conclusion 1d: The draft TSP fails to accurately forecast future "travel demand" due to the use of an unrealistically low, alternative mode share.

Failure 2
The draft plan does not conform to the requirements of OAR 660-12-0045(3)(d)(A) in that the proposed street designs (TSP, Exhibits 2 – 13, pages 56 – 67) include bicycle facility designs that would not be "reasonably free from hazards, particularly types or levels of automobile traffic which would interfere with or discourage … cycle travel for short trips."

The draft plan includes street cross-sections that would be unsafe for most people riding bicycles. All Ages and Abilities Bicycle Designs, (included by reference - https://nacto.org/wp-content/uploads/2017/12/NACTO_Designing-for-All-Ages-Abilities.pdf) a publication by the National Association of City Transportation Officials, NACTO. As the title implies, the NACTO document details bicycle designs suitable for everyone (not just adults). It embodies the TPR's requirement for "safe and convenient" bicycle network through a variety of bicycle facility designs that vary based upon traffic volumes and speeds. That integration is essential to meet the requirements of The NACTO design manual includes facility designs for neighborhoods, parkways, bike paths, as well as high speed, high volume roadways which, when combined, would create a bicycle network that will "meet(s) travel needs of bicyclists considering destination and length of trip" a requirement of OAR 660-12-0045(3)(d)(C).

Table 2-1 includes a review of the City's proposed cross-sections (pages 56 through 67) and their relationship to both LTS and "all ages and abilities" bicycle designs. Only two of the 13 proposed cross-sections (TSP, Exhibits 4 and 7) conform to "all ages and abilities" design standards. Nine of the 13 don't even meet the City's stated "standard" of LTS2 (adults only).

The separation of bicycles traffic from motor vehicle traffic on high speed high volume roadways (i.e. arterial and collector streets) is essential to the creation of a "safe and convenient" bicycle transportation network. That is even more significant given the prevalence of distracted driving. "The National Highway Traffic Safety Administration estimates that at any given moment in the United States, about 660,000 people are using mobile phones behind the wheel; 2.2% of all drivers are 'text-messaging or visibly manipulating handheld devices' at any time. This figure has

almost quadrupled over the past decade." (https://cyclingtips.com/2017/12/abcs-of-awareness-bontragers-mission-to-make-cyclists-more-visible/) That means for every 100 cars that pass a bicyclist, two are probably distracted. "Distracted driving continues to be the number one leading cause of **car accidents** in America. Talking on the phone, texting, eating, reading, grooming, and talking are just some of the ways drivers get distracted behind the wheel." (https://www.drivers.com/article/1173/)

Yet, only two of the City's 12 proposed roadway cross-section includes separation of bicycle traffic from high speed, high volume traffic.

Conclusion 2A: The draft TSP includes cross-section designs that do not conform to the TPR requirement for a "safe and convenient" bicycle network (OAR 660-12-0045(3)(d). Instead, the designs set a woefully inadequate standard based upon serving a particular age group (LTS2). Further, the draft TSP provides the authority for the City to select designs that would be dangerous for bicyclists.

Conclusion 2B: The draft TSP does not satisfy the requirements of OAR 660-12-0045(3)(d)(A) in that the proposed street designs (TSP, Exhibits 2 – 13, pages 56 – 67) do not include features that would ensure that people riding bicycles would be "reasonably free from hazards, particularly types or levels of automobile traffic which would interfere with or discourage … cycle travel for short trips."

Failure 3
The draft plan does not include systematic measures, projects, or plans that will conform, during the current planning period, to the TPR requirement (OAR 660-12-0045(3)(d)) for a "safe" bicycle network. This failure will ultimately mean that at the end of the planning horizon (2038), the bicycle transportation system will remain, as it is today, unsafe.

Table 2-1. Draft TSP cross-sections and conformance to TRP requirements.

	Draft TSP Information			Interpreted and Estimated Conditions//Recommendations			
Roadway Classification/Name	Exhibit #	Bike Facility Type	Width	Estimated 95th percentile speed	Estimated LTS	Facility Type Required to Achieve "All Ages and All Abilities"	Notes
Major Arterial/ Regional Arterial	2	Bike Lane	6	50	LTS3	Separated/Protected Bike Lane or Bicycle Path	Motor vehicle speeds should be <=25 with adjacent bike lanes
Major Arterial/ Regional Arterial	3	Buffered Bike Lane	5	50	LTS2	Separated/Protected Bike Lane or Bicycle Path	Motor vehicle speeds should be <=25 with adjacent bike lanes
Major Arterial/ Regional Arterial	4	Separated Bike Lane	7	50	LTS1	Separated/Protected Bike Lane or Bicycle Path	Motor vehicle speeds should be <=25 with adjacent bike lanes
Minor Arterial	5	Bike Lane	6	40	LTS3	Separated/Protected Bike Lane or Bicycle Path	Motor vehicle speeds should be <=25 with adjacent bike lanes
Minor Arterial	6	Buffered Bike Lane	5	40	LTS2	Separated/Protected Bike Lane or Bicycle Path	Motor vehicle speeds should be <=25 with adjacent bike lanes
Minor Arterial	7	Separated Bike Lane	7	40	LTS1	Separated/Protected Bike Lane or Bicycle Path	Motor vehicle speeds should be <=25 with adjacent bike lanes
Major Collectors	8	Bike Lane	6	35	LTS3	Separated/Protected Bike Lane or Bicycle Path	Bike lane okay if ADT less than 3,000 and speeds <=25 MPH
Minor Collector	9	Bike Lane	5	35	LTS3	Separated/Protected Bike Lane or Bicycle Path	Bike lane okay if ADT less than 3,000 and speeds <=25 MPH but should be 6 feet wide when adjacent to parking**
Minor Collector Alternative	10	Bike Lane	6	35	LTS3	Separated/Protected Bike Lane or Bicycle Path	Bike lane okay if ADT less than 3,000 and speeds <=25 MPH
Industrial Street	11	NONE	NA	30	LTS4		Bike Facility required unless speeds <10 MPH
Commercial Street	12	NONE	NA	30	LTS4		Bike Facility required unless speeds <10 MPH
Standard Residential Street	13	NONE	NA	30	LTS3	Conventional or Buffered Bicycle Lane, or Protected Bicycle Lane	Shared street okay when speeds are less than 10 MPH. Bike boulevard needed when speeds>10 or ADT>1500
Minor Residential	14	NONE	NA	25	LTS3	Shared street or Bicycle	Shared street is okay

Street						Boulevard	when speeds are less than 10 MPH.

	Draft TSP Information			Interpreted and Estimated Conditions// Recommendations			
Roadway Classification/Name	Exhibit #	Bike Facility Type	Width	Estimated 95th percentile speed	Estimated LTS	Facility Type Required to Achieve LTS1*	Notes
Minor Residential Street – Neighborhood Bikeway	15	NONE	NA	25	LTS3	Shared street or Bicycle Boulevard	Shared street is okay when speeds are less than 10 MPH.
Residential Lane	16	NONE	NA	20	LTS3	Shared street or Bicycle Boulevard	Shared street is okay when speeds are less than 10 MPH.

The draft TSP acknowledges the extent of injury and death posed by the existing bicycle network. "Cyclist collisions resulting in injury make up 97% of all cycling crashes in the City" and cycling crashes leading to the death account for "9% of all fatalities that occurred in Medford over the five year study period." (source: Draft TSP, Safety Technical Memorandum, Page 9).

The City's analysis found that bicycle crash locations are distributed widely. "The network screening process… prioritizes City intersections and roadway segments (i.e., sites) based on … crash frequency, type, and severity" (source: Draft TSP, Safety Technical Memorandum, Page 4). Consequently, only intersections or roadway segments that had multiple crashes were considered during the City's safety evaluation. While this may appear logical for a crash analysis, the approach ignores all other similarly configured locations where a bicycle crash has yet to occur but is equally dangerous. Often the identified safety solution where bike crashes occurred, is to "construct protected bike lane" (TSP, GIS Data detailing recommended bike improvements). But this "solution" is not only relevant to crash sites but almost everywhere on collector and arterial streets where speeds (currently or are forecast to) exceed 25 MPH or traffic volumes exceed 5,000 vehicles per day. Almost everywhere on the City's collector and arterial street network fits this description; the draft TSP, Figure 11, identifies many of these locations. But the City only provides that these "will be considered when improving or retrofitting roadways." (draft TSP, page 34). Thus the City has not made a remedy given the requirements of OAR 660-12-0045(3)(d). Also troubling is that the City response is predicated on "improving or retrofitting roadways" which are almost always initiated because of motor vehicle demand deficiencies, not bicycle safety.

Crash data analysis in TSP's or corridor plans often includes an system-wide evaluation in order to provide an understanding of the relative risk of a crash. Table 4-1 sets forth the relevant factors that are needed to undertake such an analysis. Using this approach, it is clear that people riding bicycles are more than four times more likely to be involved in a crash than motor vehicle drivers for every mile traveled.

Table 3-1
Crashes by Mode per Million Miles of Travel

Mode	Mode Share	Crashes (2015)	Percent of Total Crashes	Daily per Capita Mileage *	Medford 2015 Population **	Estimated VMT	Crashes per 100,000,000 Miles of Travel
Bike	1.00%	37	2.7%	0.16	77,655	4,535,052	816
Ped	6.00%	36	2.7%	NA	NA	NA	NA
Auto	90.00%	1,285	94.6%	23.1	77,655	654,748,133	196
Transit	3.00%	NA	NA	NA	NA	NA	NA
Total	100.00%	1,358					

* Source: Strategic Assessment of Transportation and Land Use Plan, RVMPO, February 2016
Table 4. Sumary of RSPM Outputs, Adopted Plans Analysis, Page 19
** Source: PSU estimate for 2015 - https://www.pdx.edu/prc/population-reports-estimates

Yet, the City's TSP does not include a specific commitment to make the bicycle system safe. That is in contrast with the motor vehicle system which is largely safe with notable exceptions. The street network poses safety problems for automobile drivers where they are most frequently concentrated at high volume intersections (where the risk of serious injury or death are lower – due to relatively low speeds). In

contrast, the safety problems of the existing bicycle network are endemic and, as the TSP's review of accident data show, 97% of all cycling crashes result in injury. There aren't any on-street bicycle facilities in the City that are safe for everyone (LTS 1).

The Plan should include a specific strategy and provide funding to ensure that by 2038 all bicycle facilities in the City:

> "(A) Are reasonably free from hazards, particularly types or levels of automobile traffic which would interfere with or discourage pedestrian or cycle travel for short trips;
>
> "(B) Provide a reasonably direct route of travel between destinations such as between a transit stop and a store; and
>
> "(C) Meet travel needs of cyclists and pedestrians considering destination and length of trip." (source OAR 660-12-0045(3)(d)

The TPR has required this outcome since 1991. Achieving it, over the course of what will be almost 50 years (at the end of the draft TSP's planning horizon), should be assured but the draft TSP falls woefully short and fails even to ensure that the bicycle system will be "safe and convenient."

Conclusion 3a: The City has failed to achieve the requirements of the OAR 660-12-0045(3)(d)) and has, inadvertently but systematically, created a bicycle network that is unsafe, and largely unusable by Medford residents. The draft plan fails to acknowledge that fact nor attempt to remedy that failure.

Conclusion 3b: The draft TSP does not include specific strategies, designs or adequate funding to ensure that the bicycle network conforms to the requirements of OAR 660-12-0045(3) by 2038, the end of the draft TSP's planning horizon.

Conclusion 3c: The draft plan fails to credibly advance the Purpose of OAR 660-12-0000 and its many related specific requirements, in particular, ensuring the safety of people who ride a bicycle.

Failure 4

The draft TSP, based upon the listing of Tier 1 and Tier 2 projects will not, taken together with the existing bicycle transportation network's safety defects (see Introduction, Figure 1), fulfill the purpose of the TPR (OAR 660-12-0000). Further, the resulting network will not ensure reasonably direct route(s) of travel between destinations for people using bikes (660-12-0045(3)(d)(B).

The existing TSP as well as the draft TSP's proposed network of bicycle facilities will also fail to provide a safe and efficient bicycle network, adequate to achieve the requirements of 660-12-0045(3)(d)(B). As is, the Bear Creek Greenway (BCGW) is one of only a few facilities in the City that are reasonably safe for "all ages and abilities." But, due to poor accessibility, gaining access to the BCGW does not achieve "reasonably direct routes of travel between residential neighborhoods" and "destination for people using bikes." Currently, there are not enough City streets, nor are there enough proposed, that would create a network of safe and efficient bicycle facilities to satisfy 660-12-0045(3)(d)(B).

The BCGW, itself, serves few destinations. It parallels Bear Creek and the Interstate 5 from the north to the south end of the City. Relatively speaking, few destinations lie along its route. No public schools, city or county buildings, banks, restaurants, major employers, etc are adjacent to the BCGW.

Conclusion 4a: The draft TSP bicycle transportation network will not be "safe and convenient" and will not provide "reasonably direct routes of travel between residential neighborhoods and "destination for people using bikes." In fact, the proposed network will include entire areas of the City that will be unsuitable for most bicycle travel by most city residents. The draft TSP does not satisfy the requirements of 660-12-0045(3)(d)(B).

Failure 5
The draft TSP will not "meet travel needs of cyclists … considering destination and length of trip." (OAR 660-12-0045(3)(d)(C)

The discussion and facts included in "Failure 5" and, in particular, the gaps identified in the future bicycle network, all but assure that the bicycle network will not serve the travel needs of cyclists. There are too many gaps, too few facilities, and too few routes that provide connections between residential areas and city destinations which would be "safe and convenient."

The City has proposed, as a part of the draft TSP, "neighborhood" bikeways. These could serve to provide "safe and convenient" travel by bicycle to meet the travel needs within and among residential neighborhoods and provide connections to other bike facilities on higher order streets. The latter are essential to provide for the needs of longer bicycle trips between home and work, school, shopping, etc.

Unfortunately, the draft TSP design for "neighborhood bikeways" does not conform to "all ages and abilities" NACTO safety measures. These measures limit motor vehicle speeds to 20 MPH or less, and provide traffic management to ensure that traffic volumes are less than 1,500 average daily traffic (ADT). Without these traffic management controls the streets will not serve "all ages and abilities" or the bicycle travel needs of residents living nearby.

The draft TSP makes the statement, without citation, that "typical volumes and speeds on Standard Residential streets are low enough to accommodate shared use of travel lanes between bicyclists and motorists." (Draft TSP, page 65) Standard Residential streets have volumes in the neighborhood of 2,500 vehicles with posted speeds of 25 MPH but actual speeds typically approach or exceed 30 MPH. Streets with these volumes and speeds require, at a minimum, a traditional bike lane to ensure that everyone can use them safely. Lowing the speed limit on residential streets to 20 MPH, which is permitted by ORS 810.180, would reduce the risk of injury to both pedestrians and cyclists using these streets, improve the quality of neighborhoods, and where volumes are less than 1,500 ADT, serve as "neighborhood bikeways." On residential streets with higher volumes, traffic management can be employed to reduce volumes to levels suitable for shared use.

Conclusion 5a: The City's determination of which streets can be shared-use are arbitrary and not based upon current standards. Therefore, the potential for these roads to serve in that capacity and, ultimately, to help meet the travel needs of people riding bicycles is overstated. The draft TSP should rely upon the current research as described in the NACTO, Designing for All Ages and Abilities and NACTO's bicycle facility design standards.

Conclusion 5b: Several of the City's "activity centers" (see draft TSP, Figure 7) will be poorly served or not served with "safe and convenient" bicycle facilities, thus frustrating their very purpose; to foster a more transportation- efficient land use pattern. Consequently, the bicycle travel needs of people living in these areas will be unmet, and the City's reliance upon "activity centers" to the meet the TPR's purpose (and Alternative Measures) will not be realized..

Conclusion 5c: The draft TSP proposed future transportation network and associated cross-section designs, taken together, will not meet the travel needs of bicyclists considering destination and length of trip" a requirement of OAR 660-12-0045(3)(d)(C).

Failure 6
The failure to detail bicycle transportation projects in the project list makes it impossible to evaluate whether the proposed projects will contribute to "meet(ing) the standards and benchmarks established pursuant to 0035(4)–(6)." OAR 660-12-0040(2)(d)) (see also failure 9).

Simply referring to "bike facilities" as is done in "Needed Roadway Projects, pages 70 – 77, without specifying the type of bike facility is too vague for the listing to serve its intended purpose. It is impossible to 1) evaluate whether the project warrants funding, 2) determine whether it will actually result in "safe and convenient" bicycle facilities, and 3) assess if it will contribute to meeting the standards and benchmarks developed pursuant to 660-12-0035(4)–(6).

Conclusion 6a: The draft TSP does the detail required under OAR 660-12-0035(4) – (6) in the "needed roadway projects" listing to determine the merit of individual projects or the degree to which each project conforms to the requirements of the TPR in particular OAR 660-12-0035(3)(d).

Failure 7
The draft TSP "legacy street policy" effectively grants the City permission to ignore the requirements of the TPR related to alternative modes on most existing streets under its jurisdiction. Such a policy would undermine the purpose of the TPR and ORS 660-12-0045.

The draft plan states "Existing improved (with curb and gutter) roads that do not meet these cross-section standards are considered Legacy Streets." (draft TSP, page 54) This designation includes almost every street within the City. The "legacy street policy" would allow the City to continue to build and require right-of-way dedication for motor vehicles lanes while limiting or precluding the same for bicycle needs.

The policy provides that where the right-of-way is constrained the "cross section is (will be) modified to provide for all modes by narrowing elements within the design." (draft TSP, Table 4, page 69). Historically, that has meant the City has constructed substandard and dangerous bike lanes while maintaining motor vehicle lane width standards. The legacy street policy will formalize and perpetuate this outcome.

The policy will significantly undermine the potential for existing streets to be improved to meet the travel needs of people riding bicycles. As such, the legacy street policy is contrary to "the purposes of" OAR 660-12-0045) which "are to provide for safe and convenient pedestrian, bicycle and vehicular circulation

consistent with access management standards and the function of affected streets, to ensure that new development provides on-site streets and access-ways that provide reasonably direct routes for pedestrian and bicycle travel in areas where pedestrian and bicycle travel is likely if connections are provided, and which avoids wherever possible levels of automobile traffic which might interfere with or discourage pedestrian or bicycle travel."

Conclusion 7a: The draft TSP legacy street policy undermines the objectives of the TPR to reduce reliance upon motor vehicle travel, and to promote and encourage the use of alternative transportation modes.

Conclusion 7b: The legacy street policy, by limiting development of bike facilities on existing streets, conflicts with the requirements of OAR 660-12-0045.

Failure 8
The City's inventory of bicycle facilities does not conform to the requirements of OAR 660-12-0020(3)(d).

The inventory of bike lanes is not accurate. Overly narrow bicycle facilities were classified as "bike lanes" when they are too narrow to warrant the description. The lack of an accurate bike facilities inventory and the City's practice of constructing too narrow of bike lanes has compromised the accuracy of the "level of traffic stress" (LTS) analysis undertaken by the City.

According to ODOT, Transportation Planning Analysis Unit, 6/11/18 email from Peter L. Schuytema, P.E., this analysis method "generally assume(s) that design elements are within standards. For bike lane(s), that is four feet. Anything less than 4' is too narrow to have any separation from motor vehicle traffic and shouldn't be classified as a bike lane. Your example looks to be around 3' assuming full use of the gutter. I would call it more of a wide outside shoulder /shared lane condition and shouldn't be marked as a bike lane. Under LTS, I would use the mixed traffic conditions instead for these cases as the bicyclist is riding on the line or even over it, so there will be the same type of interference. Using the mixed traffic criteria will give a worse LTS than a proper width bike lane."

Bike lanes less than four feet "shouldn't be classified as (a) bike lane" (ibid). Consequently, the City's existing bike inventory (draft TSP, Figure 9) is not accurate. The draft TSP does not include any description of the LTS methodology but it likely relied upon the flawed inventory.

There is seemingly no inventory of the condition of the Bear Creek Greenway, its capacity or condition. That has led to the draft plan not evaluating the need for a wider or separate paths for bicyclists and pedestrians through the central part of the City. Here, there are already conflicts between pedestrians, people sitting on or next to the path, and cyclists.

Conclusion 8a: The draft TSP does not contain an accurate inventory of existing bicycle facilities required by OAR 660-12-0020(3)(d) which requires "an inventory and general assessment of existing and committed transportation facilities and services by function, type, capacity and condition."

Conclusion 8b: The lack of an inventory has led to the draft plan not addressing existing capacity issues on the Bear Creek Greenway in the central part of the City.

Failure 9
OAR 660-012-0020(3)(b) requires the City's TSP to include a "system of planned transportation facilities, services and major improvements. The system shall include a description of the type or functional classification of planned facilities and services and their planned capacities and performance standards."

Table 19 of the draft TSP includes project "P2" which is described as (improvements at) "various bicycle network gap locations with focus on high-priority areas including schools, activity centers and essential destinations, transit routes, and transit oriented development areas." The project is described as "evaluate and construct potential roadway reconfigurations to accommodate bicycle facilities through re-striping and/or minor reconstruction at high-priority locations ($100,000 annually)."

These locations are apparently known, or would be expected to be known, through the City's review of its bicycle network and the draft TSP's LTS analysis. The draft TSP, however and for purposes of project P2, fails to disclose their location. Absent this information, it is impossible for the public to evaluate the merits of the project or evaluate whether the project, in fact, includes high priority locations. P2 is the only Tier 1 bicycle project. Given the widespread safety defects of the existing bike lane network this project is woefully underfunded and too vague.

Conclusion 9a: The draft TSP's failure to include a "description of the type" of improvements planned, the standards that will be used, their planned capacity and their location is inconsistent with the requirements of OAR660-12-0020(3)(b).

Failure 10
The City draft TSP, in establishing street cross-sections which do not meet the travel needs of bicyclists of "all ages and abilities, is inconsistent with the Oregon constitution and ORS 659A.006.

The City concludes in a November 20, 2017 memo entitled Transportation System Plan – Bicycle and Pedestrian Level of Traffic Stress (described by the City as a Technical Memorandum) "when considering LTS for policy implementation, achieving a LTS 2 is the most realistic standard…" The statement suggests that the City will rely upon Level of Traffic Stress (LTS) 2 as the standard for street upgrades and new construction. Such an approach is inconsistent with the objectives of the Transportation Planning Rule (TPR) which requires a "safe and convenient," well-connected network. The draft plan provides no discussion about who would be excluded, by virtue of street design, from using the resulting bicycle network.

The Oregon Department of Transportation, Analysis Procedure Version 2, Multi-modal Analysis (https://www.oregon.gov/ODOT/Planning/Documents/APMv2_Ch14.pdf, page 14-11) acknowledges that LTS 2 is suitable for "teen and adult cyclists with adequate bike handling skills." Consequently, people with lower bike handling skills, people with reduced reaction time, people with diminished hearing, people with disabilities, families with multi-generational cyclists, would find LTS 2 facilities "unsuitable." In this context, unsuitable facilities means unsafe, dangerous, not worth the risk, etc.

A rough estimate of the number of Medford residents who could safely use the bicycle network at different LTS levels is detailed in Table 2-1. Setting LTS2 as the "realistic standard" has the effect of

excluding 22,207 or 27 percent of the City's residents from using a bike (51,137 - 28,930). That number excludes those City residents who would "never ride a bike." (see Summary of Medford Transportation Survey, City of Medford, August 2017, question 17)

Table 10-1

Estimated Population that would Ride a Bike for Transportation
By Level of Transportation Stress (LTS)

Age	Est. Pop Total *	LTS 4	LTS 3	LTS 2	LTS 1
Under 5	5,878	0	0	0	0
6- 17	19,674				13,280
18-64	42,859	429	3,214	28,930	28,930
65 plus	13,225				8,927
Total	81,636	429	3,214	28,930	51,137

* 2010 US Census of Population

OAR 659.006, **Declaration of policy against unlawful discrimination**, states:

> "(1) It is declared to be the public policy of Oregon that practices of unlawful discrimination against any of its inhabitants because of race, color, religion, sex, sexual orientation, national origin, marital status, age, disability or familial status are a matter of state concern and that this discrimination not only threatens the rights and privileges of its inhabitants but menaces the institutions and foundation of a free democratic state. (2) The opportunity to obtain employment or housing or to use and enjoy places of public accommodation without unlawful discrimination because of race, color, religion, sex, sexual orientation, national origin, marital status, age or disability hereby is recognized as and declared to be a civil right. A place of public accommodation is defined by 659A.400 as follows: (a) Any place or service offering to the public accommodations, advantages, facilities or privileges whether in the nature of goods, services, lodgings, amusements, transportation or otherwise. (b) Any place that is open to the public and owned or maintained by a public body, as defined in ORS 174.109, regardless of whether the place is commercial in nature. (c) Any service to the public that is provided by a public body, as defined in ORS 174.109, regardless of whether the service is commercial in nature."

Conclusion 10a: The City's use of LTS 2 as a basis for its bicycle transportation facilities designs discriminates against those people who may have lower bike handling skills, are old, are younger than a teen, people having a physically limiting condition, and groups of people composed of multi-generational bicycle riders (i.e. families).

Conclusion 10b: The Plan's approach to bicycle transportation (by setting LTS 2) fails to serve all ages and abilities of people; including people who 1) now ride only on the Bear Creek Greenway, 2) limit their bicycling to their own residential neighborhood, 3) ride a bike but only for recreational purposes on the weekend, 4) are afraid to ride a bicycle on City streets, or 5) may want to "drive" a bicycle in the future.

Conclusion 10c: The use of LTS 2 is inconsistent with Object 11 of the draft TSP which reads: "The City of Medford will strive to develop and maintain a well-connected transportation system for all modes and users." (emphasis added).

Exhibit 1

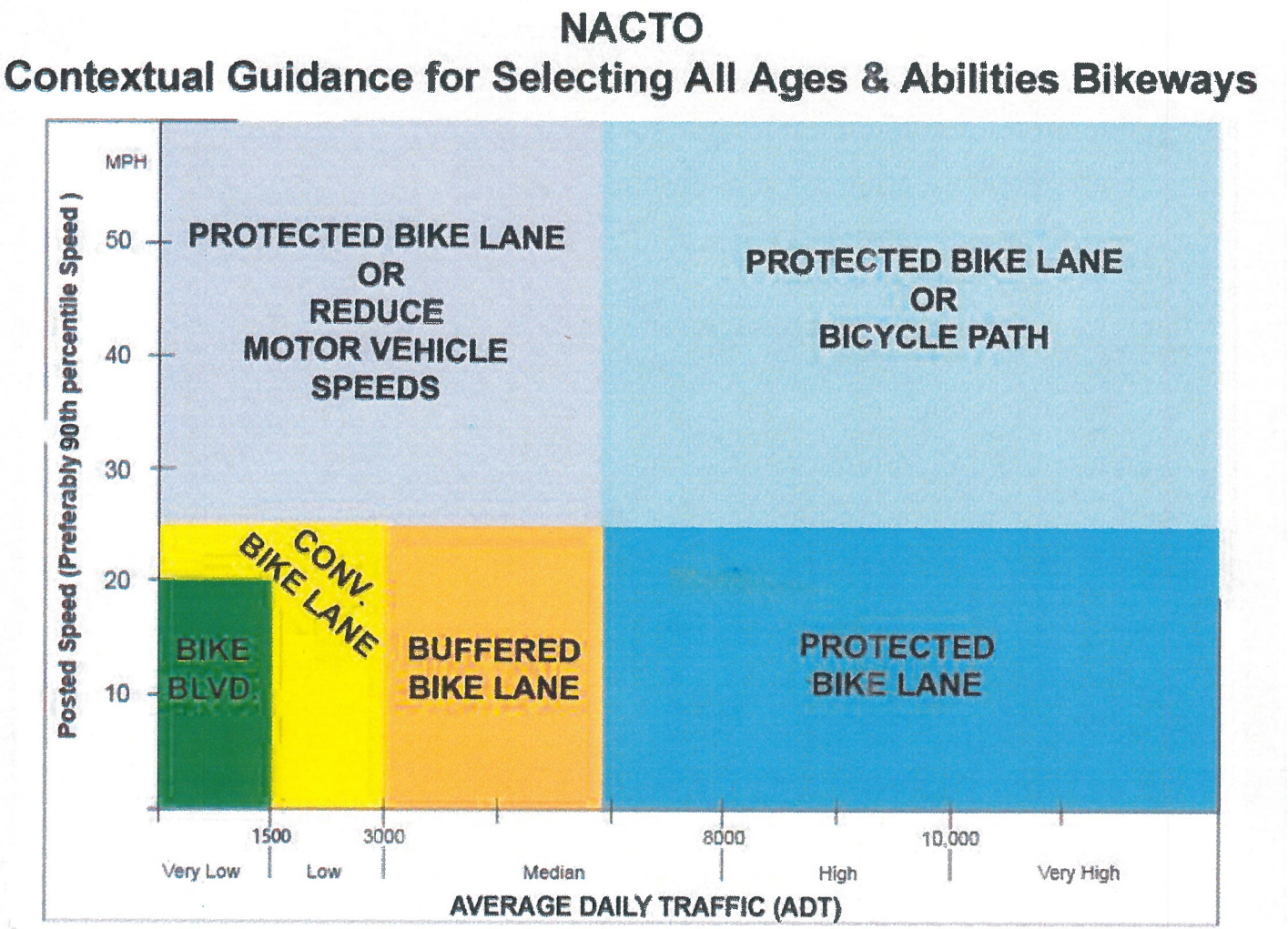
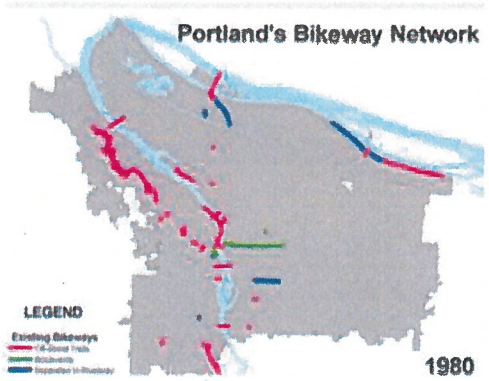
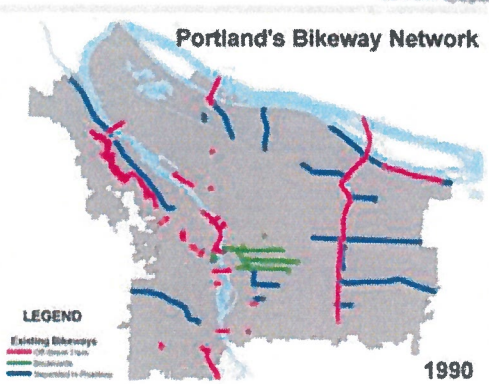

NACTO
Contextual Guidance for Selecting All Ages & Abilities Bikeways
Posted Speed (Preferably 90th percentile Speed)
MPH
50
40
30
20
10
PROTECTED BIKE LANE OR REDUCE MOTOR VEHICLE SPEEDS
PROTECTED BIKE LANE OR BICYCLE PATH
CONV. BIKE LANE
BIKE BLVD.
BUFFERED BIKE LANE
PROTECTED BIKE LANE
1500
3000
8000
10,000
Very Low
Low
Median
High
Very High
AVERAGE DAILY TRAFFIC (ADT)

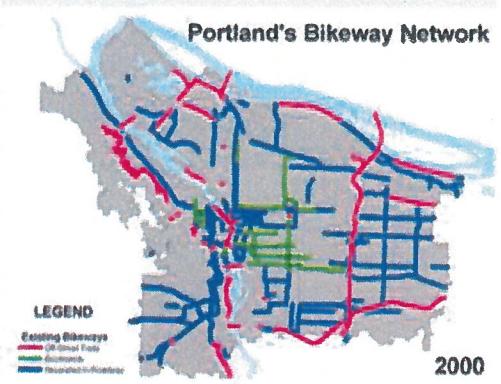
Exhibit 2

Portland's Safe and Convenient Bicycle Facility Network

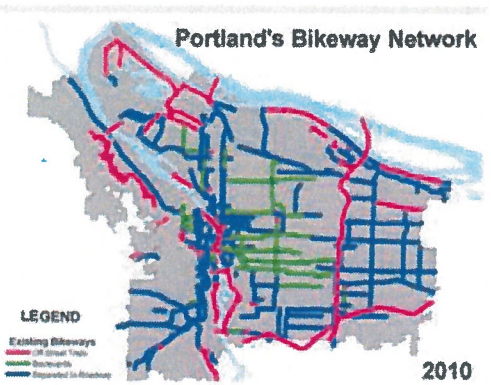




Bicycle Mode Share: 1.0 percent



Bicycle Mode Share: 1.8 percent



Bicycle Mode Share: 6.1 percent

Exhibit 3

Change in Demand with Safe and Convenient Bike Facilities

(before and after experience)

US Cities are highlighted. It should be noted that there is no indication of the extent of the connecting bike network associated with the protected bike lanes cited below. If they are isolated and do not connect to an "all ages and abilities" network the impact on bike ridership can be diminished. It is like building a freeway without on-ramps. No one can use it.

In 2007, the city of Seville, Spain, rapidly connected a network of protected bike lanes. They grew the bike network from 7.5 miles of protected bike lanes in 2006 to 94 miles in 2013. During the same time period the number of bike trips grew 435 percent from 3 million in 2006 to more than 16 million in 2013. At the same time, the risk of being involved in a crash with a motor vehicle dropped 61 percent.
R. Marqués and V. Hernández-Herrador - On the effect of networks of cycle-tracks on the risk of cycling: The case of Seville

38 percent of people biking on Sherbourne Street in Toronto switched to biking for that trip after Sherbourne got a protected bike lane. Of those, 24 percent switched from driving. People taking longer trips and people over age 40 were more likely to make a car-to-bike switch.
Raymond Ziemba, Raktim Mitra, Paul M. Hess - Mode Substitution Effect of Urban Cycle Tracks: Case Study of a Downtown Street in Toronto, Canada

On Washington DC's first protected bike lanes, bike traffic has been growing seven times faster than the citywide rate.
District Department of Transportation, 2009-2013 - How high can they go? DC bike counts show continuing surge in protected lane use

In Seville, an 80-mile network of protected bike lanes boosted biking from 0.6 percent to 7 percent of trips in six years.
London Cycling Campaign, 2012 - Cycling increased tenfold in Seville after construction of miles of bike tracks.""

In Hangzhou, China, where 84 percent of main and secondary roads separate bikes from cars, 44 percent of middle school parents who own cars (and 62 percent of those who don't) ride a bike at least once a week.
Lusk et al, 2014 - Gender and used/preferred differences of bicycle routes, parking, intersection signals, and bicycle type: Professional middle class preferences in Hangzhou, China." Journal of Transport & Health."

In the two U.S. cities that first started building modern protected bike lanes, New York and Washington D.C., bike commuting doubled from 2008 to 2013.
US Census - NYC and DC, protected lane pioneers, just doubled biking rates in 4 years

The average protected bike lane sees bike counts increase 75 percent in its first year alone.
Monsere, C., et al., 2014 - Lessons from the Green Lanes (National Institute for Transportation and Communities)

Intersections in Montreal with protected bike lanes saw 61 percent more bike traffic than comparable intersections with no bike infrastructure.
The Journal of Transport and Land Use, 2013 - Spatial modeling of bicycling activity at signalized intersections

On D.C.'s Pennsylvania Avenue protected bike lane, bicycle volumes increased 200 percent after the facilities were installed.
District Department of Transportation, 2012 - District Department of Transportation Bicycle Facility Evaluation

NYC's Prospect Park West protected bike lane saw a 190 percent increase in weekday ridership.
NYC DOT, 2012 - Prospect Park West: Traffic Calming & Bicycle Path

After a protected bike lane was installed on Chicago's Kinzie Street: Bicycle ridership on increased 55 percent, according to morning rush hour counts; Forty-one percent of respondents changed their usual route to take advantage of the new lane; Bicyclists accounted for a majority of all eastbound traffic (53 percent) and more than one third (34 percent) of total street traffic during a CDOT traffic count conducted during morning rush hour in August 2011.
Chicago DOT, 2011 - Initial Findings: Kinzie Street Protected Bike Lane

After buffered bike lanes were installed on Philadelphia's Spruce and Pine streets, bike traffic increased 95 percent and the number of people biking on the sidewalks fell 22 percent.
Bicycle Coalition of Greater Philadelphia, 2009 - Bicycle usage up 95% on Spruce and Pine bike lanes""

From 2006-2011, bicycling in San Francisco increased 71 percent. From 2010-2011, it increased 7 percent, making up 3.5 percent of all trips in the city. The greatest growth in bicycling came on Market Street, which has protected bike lanes. On Market Street, bicycling increased 115 percent from 2006, and 43 percent from 2010.
San Francisco Municipal Transportation Agency, 2012 - 2011 Bicycle Count Report

After New York City installed a protected bike lane on Columbus Avenue, bicycling increased 56 percent on weekdays, crashes decreased 34 percent, speeding decreased, sidewalk riding decreased, traffic flow remained similar, and commercial loading hours/space increased 475 percent.
New York City Department of Transportation, 2011 - Columbus Avenue parking-protected bicycle path preliminary assessment

Source: http://peopleforbikes.org/our-work/statistics/statistics-category/?cat=protected-bike-lane-statistics

Designing for All Ages & Abilities

Contextual Guidance for High-Comfort Bicycle Facilities

NACTO
National Association of City Transportation Officials

December 2017

Streets that are safe and comfortable for All Ages & Abilities bicycling are critical for urban mobility.

NACTO cities are leading the way in designing streets that are truly safe and inviting for bicyclists of All Ages & Abilities and attract wide ridership. This guidance—developed by practitioners from cities across North America—builds on NACTO's *Urban Bikeway Design Guide* and sets an **All Ages & Abilities** criteria for selecting and implementing bike facilities. Building bicycle infrastructure that meets this criteria is an essential strategy for cities seeking to improve traffic safety,[1] reduce congestion,[2] improve air quality and public health,[3] provide better and more equitable access to jobs and opportunities,[4] and bolster local economies.[5]

This All Ages & Abilities facility selection guidance is designed to be used in a wide variety of urban street types. It considers contextual factors such as vehicular speeds and volumes, operational uses, and observed sources of bicycling stress. In doing so, it allows planners and engineers to determine when, where, and how to best combine traffic calming tools, like speed reduction and volume management, with roadway design changes, like full lane separation, to reduce traffic fatalities and increase cycling rates and rider comfort.

The All Ages & Abilities criteria is a national and international best practice that should be adopted for all bicycle facility design and network implementation; lesser accommodation should require additional justification. Along with a problem-solving approach to street design, the All Ages & Abilities benchmark should be applied across a city's entire bicycle network to grow bicycling as a safe, equitable mode for the majority of people.

All Ages & Abilities Bike Facilities are ...

Safe

More people will bicycle when they have safe places to ride, and more riders mean safer streets. Among seven NACTO cities that grew the lane mileage of their bikeway networks 50% between 2007–2014, ridership more than doubled while risk of death and serious injury to people biking was halved.[6] Better bicycle facilities are directly correlated with increased safety for people walking and driving as well. Data from New York City showed that adding protected bike lanes to streets reduced injury crashes for all road users by 40% over four years.[7]

Comfortable

Bikeways that provide comfortable, low-stress bicycling conditions can achieve widespread growth in mode share. Among adults in the US, only 6–10% of people generally feel comfortable riding in mixed traffic or painted bike lanes.[8] However, nearly two-thirds of the adult population may be interested in riding more often, given better places to ride, and as many as 81% of those would ride in protected bike lanes.[9] Bikeways that eliminate stress will attract traditionally under-represented bicyclists, including women, children, and seniors.

Equitable

High-quality bikeways expand opportunities to ride and encourage safe riding. Poor or inadequate infrastructure—which has disproportionately impacted low-income communities and communities of color—forces people bicycling to choose between feeling safe and following the rules of the road, and induces wrong-way and sidewalk riding. Where street design provides safe places to ride and manages motor vehicle driver behavior, unsafe bicycling decisions disappear,[11] making ordinary riding safe and legal and reaching more riders.

SE Mill Street, PORTLAND
(photo credit: Portland Bureau of Transportation)

Who is the "All Ages & Abilities" User?

To achieve growth in bicycling, bikeway design needs to meet the needs of a broader set of potential bicyclists. Many existing bicycle facility designs exclude most people who might otherwise ride, traditionally favoring very confident riders, who tend to be adult men. When selecting a bikeway design strategy, identify potential design users in keeping with both network goals and the potential to broaden the bicycling user base of a specific street.

Children

School-age children are an essential cycling demographic but face unique risks because they are smaller and thus less visible from the driver's seat than adults, and often have less ability to detect risks or negotiate conflicts.

Seniors

People aged 65 and over are the fastest growing population group in the US, and the only group with a growing number of car-free households.[12] Seniors can make more trips and have increased mobility if safe riding networks are available. Bikeways need to serve people with lower visual acuity and slower riding speeds.

Women

Women are consistently under-represented as a share of total bicyclists, but the share of women riding increases in correlation to better riding facilities.[13] Concerns about personal safety including and beyond traffic stress are often relevant. Safety in numbers has additional significance for female bicyclists.

People Riding Bike Share

Bike share systems have greatly expanded the number and diversity of urban bicycle trips, with over 28 million US trips in 2016.[14] Riders often use bike share to link to other transit, or make spontaneous or one-way trips, placing a premium on comfortable and easily understandable bike infrastructure. Bike share users range widely in stress tolerance, but overwhelmingly prefer to ride in high-quality bikeways. All Ages & Abilities networks are essential to bike share system viability.

People of Color

While Black and Latinx bicyclists make up a rapidly growing segment of the riding population, a recent study found that fewer than 20% of adult Black and Latinx bicyclists and non-bicyclists feel comfortable in conventional bicycle lanes; fear of exposure to theft or assault or being a target for enforcement were cited as barriers to bicycling.[15] Long-standing dis-investment in street infrastructure means that these riders are disproportionately likely to be killed by a car than their white counterparts.[16]

Low-Income Riders

Low-income bicyclists make up half of all Census-reported commuter bicyclists, relying extensively on bicycles for basic transportation needs like getting to work.[17] In addition, basic infrastructure is often deficient in low-income neighborhoods, exacerbating safety concerns. An All Ages & Abilities bikeway is often needed to bring safe conditions to the major streets these bicyclists already use on a daily basis.

People with Disabilities

People with disabilities may use adaptive bicycles including tricycles and recumbent handcycles, which often operate at lower speeds, are lower to the ground, or have a wider envelope than other bicycles. High-comfort bicycling conditions provide mobility, health, and independence, often with a higher standard for bike infrastructure needed.

People Moving Goods or Cargo

Bicycles and tricycles outfitted to carry multiple passengers or cargo, or bicycles pulling trailers, increase the types of trips that can be made by bike, and are not well accommodated by bicycle facilities designed to minimal standards.

Confident Cyclists

The small percentage of the bicycling population who are very experienced and comfortable riding in mixed motor vehicle traffic conditions are also accommodated by, and often prefer, All Ages & Abilities facilities, though they may still choose to ride in mixed traffic.

Choosing an All Ages & Abilities Bicycle Facility

This chart provides guidance in choosing a bikeway design that can create an All Ages & Abilities bicycling environment, based on a street's basic design and motor vehicle traffic conditions such as vehicle speed and volume. This chart should be applied as part of a flexible, results-oriented design process on each street, alongside robust analysis of local bicycling conditions as discussed in the remainder of this document.

Users of this guidance should recognize that, in some cases, a bicycle facility may fall short of the All Ages & Abilities criteria but still substantively reduce traffic stress. Jurisdictions should not use an inability to meet the All Ages & Abilities criteria as reason to avoid implementing a bikeway, and should not prohibit the construction of facilities that do not meet the criteria.

Contextual Guidance for Selecting All Ages & Abilities Bikeways

Roadway Context				All Ages & Abilities Bicycle Facility
Target Motor Vehicle Speed*	**Target Max. Motor Vehicle Volume (ADT)**	**Motor Vehicle Lanes**	**Key Operational Considerations**	
Any		*Any*	*Any of the following:* high curbside activity, frequent buses, motor vehicle congestion, or turning conflicts‡	**Protected Bicycle Lane**
< 10 mph	Less relevant	No centerline, or single lane one-way	Pedestrians share the roadway	**Shared Street**
≤ 20 mph	≤ 1,000 – 2,000		< 50 motor vehicles per hour in the peak direction at peak hour	**Bicycle Boulevard**
≤ 25 mph	≤ 500 – 1,500			
	≤ 1,500 – 3,000	Single lane each direction, or single lane one-way	Low curbside activity, or low congestion pressure	**Conventional or Buffered Bicycle Lane, or Protected Bicycle Lane**
	≤ 3,000 – 6,000			**Buffered or Protected Bicycle Lane**
	Greater than 6,000			**Protected Bicycle Lane**
	Any	Multiple lanes per direction		
Greater than 26 mph†	≤ 6,000	Single lane each direction	Low curbside activity, or low congestion pressure	**Protected Bicycle Lane, or Reduce Speed**
		Multiple lanes per direction		**Protected Bicycle Lane, or Reduce to Single Lane & Reduce Speed**
	Greater than 6,000	*Any*	*Any*	**Protected Bicycle Lane, or Bicycle Path**
High-speed limited access roadways, natural corridors, or geographic edge conditions with limited conflicts		*Any*	High pedestrian volume	**Bike Path with Separate Walkway or Protected Bicycle Lane**
			Low pedestrian volume	**Shared-Use Path or Protected Bicycle Lane**

*While posted or 85th percentile motor vehicle speed are commonly used design speed targets, 95th percentile speed captures high-end speeding, which causes greater stress to bicyclists and more frequent passing events. Setting target speed based on this threshold results in a higher level of bicycling comfort for the full range of riders.

† Setting 25 mph as a motor vehicle speed threshold for providing protected bikeways is consistent with many cities' traffic safety and Vision Zero policies. However, some cities use a 30 mph posted speed as a threshold for protected bikeways, consistent with providing Level of Traffic Stress level 2 (LTS 2) that can effectively reduce stress and accommodate more types of riders.[18]

‡ Operational factors that lead to bikeway conflicts are reasons to provide protected bike lanes regardless of motor vehicle speed and volume.

The All Ages & Abilities Design Toolbox

Five major types of bikeway provide for most bike network needs, based on the contextual guidance on page 4. This list is organized from more to less shared operation with automobiles. Each facility type is appropriate as an All Ages & Abilities bikeway in relevant street contexts. The NACTO *Urban Bikeway Design Guide* provides detailed guidance on bikeway facilities.

Argyle Street, CHICAGO
(photo credit: Chicago DOT)

Low-Speed Shared Streets allow bicyclists to comfortably operate across the entire roadway. Shared streets target very low operating speeds for all users, typically no greater than 10 mph. The volume of people walking and bicycling should be much greater than vehicle volume to maintain comfort. Issues for bicycling in shared environments arise from conflicts with people walking, who may be expected at any point across the street's width. Materials and street edges must be appropriate for bicycling; materials are often varied to delineate road space, but any seams or low mountable curbs must be designed to avoid creating fall hazards for bicyclists.

SE Taylor Street, PORTLAND
(photo credit: Greg Raisman)

Bicycle Boulevards (or neighborhood greenways) provide continuous comfortable bicycle routes through the local street network. Bike Boulevards are characterized by slow motor vehicle speeds and low volumes. Sometimes these are present by the very nature of the street and its function (e.g. narrow streets with no major destinations), but sometimes design work is needed, such as adding traffic calming elements, filtering most motor vehicle traffic off, and/or prioritizing bicycles at major and minor street intersections. In this way, bicycling is made comfortable across the entire roadway. Directional markings and wayfinding signage provide riders with intuitive, coherent routing.

Laurier Avenue E, MONTRÉAL
(photo credit: Dylan Passmore)

Buffered & Conventional Bicycle Lanes provide organized space for bicycling, and are often part of street reconfiguration projects that improve safety and comfort for all users. Bicycle lanes are an important tool to improve comfort and safety on streets where the number of passing events is too high for comfortable mixed-traffic bicycling, but where curbside activity, heavy vehicles, and lane invasion are not significant sources of conflict. Buffered bike lanes are almost always higher comfort than conventional bike lanes. In many cases, cross-sections with room for buffered bicycle lanes also have room for protected bicycle lanes.

Dunsmuir Street, VANCOUVER
(photo credit: Paul Kreuger via Flickr)

Protected Bicycle Lanes (also known as Separated Bike Lanes or Cycle Tracks) use a combination of horizontal separation (buffer distance) and vertical separation (e.g. flex posts, parked cars, or curbs) to protect people bicycling from motor vehicle traffic. The combination of lateral buffer distance and vertical separation elements (such as flexible delineators, curbs or height differences, or vehicle parking) can ameliorate most of the stressors of on-street bicycling. The robustness of bikeway separation often scales relative to adjacent traffic stress.

Cultural Trail, INDIANAPOLIS
(photo credit: Green Lanes Project)

Shared-Use & Bicycle Paths have in many cities served as the early spines of an All Ages & Abilities network. Paths can provide a continuous corridor, but usually do not take riders to their destinations. High pedestrian volumes, driveways, obtrusive bollards, sharp geometry, and crossings all degrade bicycling comfort, but often require long project timelines to eliminate. To become useful for transportation, paths work best when connected to an on-street network that meets the same high benchmark of rider comfort, and design provides bicycle-friendly geometry. Ideally, bicycles should be separated from pedestrians where significant volume of either mode is present, but where space limitations exist, multi-use paths are still valuable.

Motor Vehicle Speed & Volume Increase Stress

Whether or not people will bicycle is heavily influenced by the stresses they encounter on their trip. These stressors impact their actual physical safety and their perceived comfort level.

For all roadways and bike facilities, two of the biggest causes of stress are vehicular traffic speed and volume. These factors are inversely related to comfort and safety; even small increases in either factor can quickly increase stress and potentially increase injury risk.[19] The stresses created by speed are compounded by vehicular volume, and vice versa.

Slower or less confident bicyclists experience "near misses"—or non-injury incidents that cause stress—much more frequently per trip than faster riders, which can contribute to discouraging people from riding who would otherwise do so.[20]

SPEED

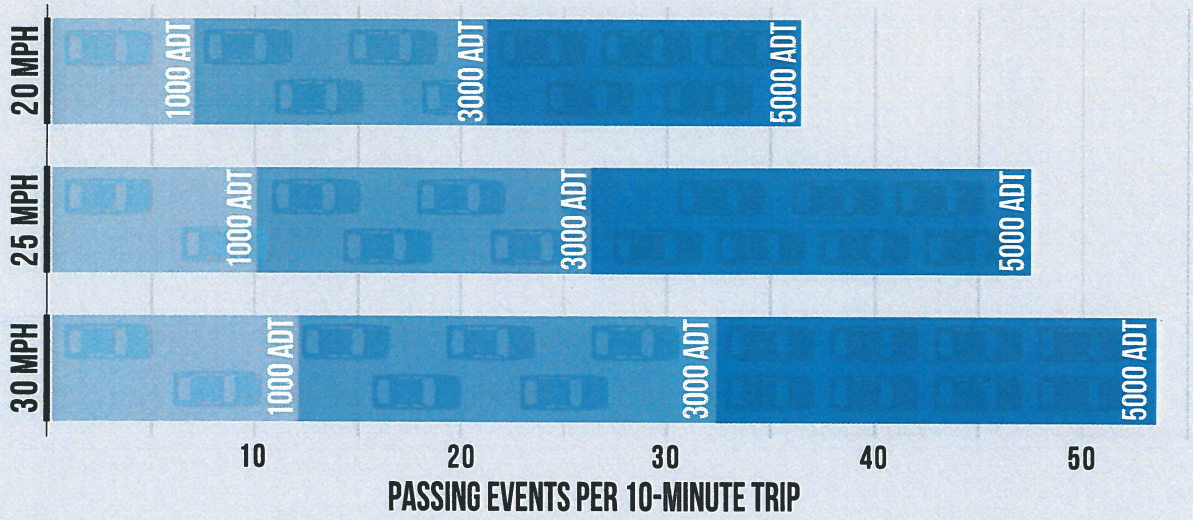
High motor vehicle speeds and speeding introduce significant risk to all road users, narrowing driver sight cones, increasing stopping distance, and increasing injury severity and likelihood of fatality when crashes occur.[21] Most people are not comfortable riding a bicycle immediately next to motor vehicles driving at speeds over 25 mph. Conventional bike lanes are almost always (with rare exceptions) inadequate to provide an All Ages & Abilities facility in such conditions.

VOLUME

When vehicular volumes and speeds are low, most people feel most comfortable bicycling in the shared roadway as they are able to maintain steady paths and riding speeds with limited pressure to move over for passing motor vehicles. However, as motor vehicle volume increases past 1,000 – 2,000 vehicles per day (or roughly 50 vehicles in the peak direction per peak hour), most people biking will only feel comfortable if vehicle speeds are kept below 20 mph.

Conflicts Increase with Speed & Volume

This chart illustrates the number of passing events (at increasing motor vehicle average speed and volume) experienced over a 10-minute period by a bicyclist riding 10 mph. As motor vehicle speed and volume increase, they magnify the frequency of stressful events for people bicycling.



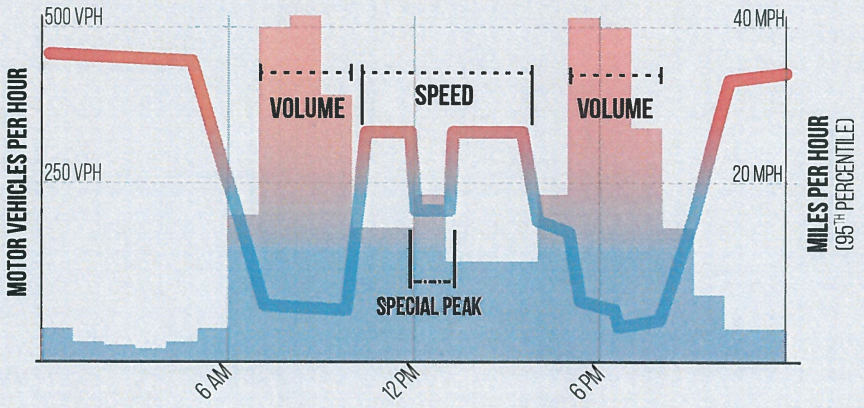
Motor Vehicle Speed and Volume Amplify One Another as They Increase

The frequency at which a person bicycling is passed by motor vehicles is one of the most useful indicators of the level of stress of a roadway or bike facility. Passing events increase with speed and volume, decreasing rider comfort and safety. Where car traffic is routinely above 20 mph, or where traffic volume is higher than 50 vehicles per direction per hour, pressure on bicyclists from motor vehicles attempting to pass degrades comfort for bicycling and increases risk.

- **At speeds of 20 mph,** streets where daily motor vehicle volume exceeds 1,000 – 2,000 vehicles, frequent passing events make shared roadway riding more stressful and will deter many users.
- **Between 20 and 25 mph,** comfort breaks down more quickly, especially when motor vehicle volume exceeds 1,000 – 1,500 ADT. When motor vehicle speeds routinely exceed 25 mph, shared lane markings and signage are not sufficient to create comfortable bicycling conditions.
- **Motor vehicle speeds 30 mph or greater** reduce safety for all street users and are generally not appropriate in places with human activity.
- **Where motor vehicle speeds exceed 35 mph,** it is usually impossible to provide safe or comfortable bicycle conditions without full bikeway separation.

Sources of Stress Change Throughout the Day

Large fluctuations in motor vehicle traffic volume between morning, mid-day, afternoon, and nighttime result in radically different bicycling conditions on the same street throughout the day. The example at right shows a street with roughly 500 vehicles per direction per hour during the peak. While queuing stress occurs at peak times, low off-peak volume results in dangerously high motor vehicle speeds.



Peak vs. Off-Peak

The variation in speed and volume conditions between peak and off-peak hours can manifest as two distinct issues that decrease comfort and safety.

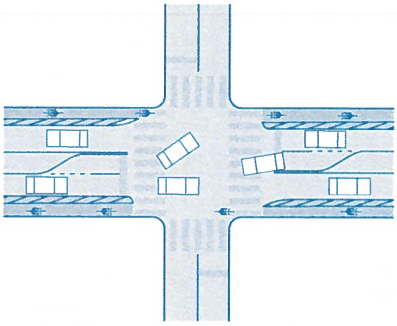
- **During high-volume peak periods,** motor vehicle queuing prevents comfortable mixed-traffic operation and increases the likelihood of bicycle lane incursions, unless physical separation is present.
- **During off-peak periods,** speeds can rise quickly, especially on wide and multi-lane streets, unless the street's design and operations specifically discourage speeding. Streets with very low off-peak volumes that also see little speeding, including many small neighborhood streets, may indicate All Ages & Abilities conditions if peak volumes are managed effectively.
- **Special Peaks** occur on streets that experience intensive peak activity periods. Schools have multiple short windows of time where pedestrian and motor vehicle activity are intense at exactly the time and place where the appeal of All Ages & Abilities bicycling is most sensitive. Downtown cores and retail streets experience intensive commercial freight activity throughout the day including at off-peak times, adding importance to the creation of protected bike lanes.

Changing the Street: Design, Operation, Networks

Not every solution that helps to create safe and comfortable bicycling conditions will be a geometric design. Creating a network of high-comfort bicycle facilities that meet the All Ages & Abilities criteria requires leveraging the full suite of design, operational, and network strategies to transform streets. Strategies can be implemented incrementally to address sources of stress and conflict, change demand for access and movement, and ultimately transform streets for all users by continuously increasing comfort and creating more opportunities to make more trips by bicycle.

Change Design

Design strategies change the cross-section of a street in order to provide bike lanes, buffered bike lanes, protected bike lanes, or other dedicated bicycle infrastructure. Creating dedicated space for bicycling— either by reducing the number of motor vehicle lanes or their width—usually does not involve substantial changes to motor vehicle volume or the types of vehicles that can use a street, and has substantial benefits for the safety of all street users. 4-to-3 and 4-to-2-lane (with left turn pocket) conversions are widely used, and many other street redesigns apply the same basic principle of organizing movements and modes into dedicated space to improve the efficiency of each space.



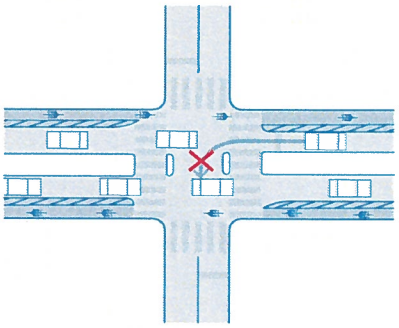
Examples:

- **Repurpose Motor Vehicle Lane**
- **Convert from Buffered to Protected Bike Lane**

Change Operation

Operational changes—such as speed reduction, signalization and other conflict management, and proactive curbside management—improve bicycling conditions by reducing the level of traffic stress on a street. Operational strategies make streets more predictable, efficient, and safe without necessarily changing the street's cross-section or the types of vehicles allowed.

On all facility types, reducing motor vehicle speeds to 20 – 25 mph is a core operational strategy for improving bicycle comfort and meeting the All Ages & Abilities criteria. In addition, reducing speeds can also make it easier to enact other safety changes, such as changes to intersection geometry, signalization, turn lanes, and turn restrictions. Since operational changes do not impact what types of vehicles can use the street, they usually do not require significant planning beyond the street itself, and are often the easiest type of change to implement.



Examples:

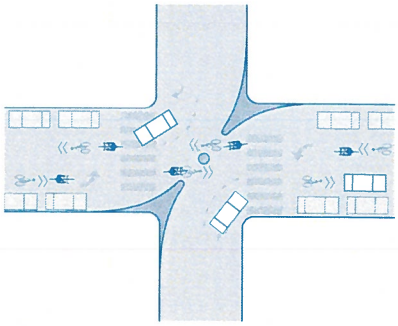
- **Signal Separation of Conflicting Movements**
- **Low-Speed Signal Progression**

Change the Network

Diverting motor vehicle traffic from a street, changing travel direction, (dis)allowing specific types of curbside access, and making other changes to the role of a street in the motor vehicle network are powerful ways to create All Ages & Abilities bicycling conditions. Such network changes allow the street to be transformed into a comfortable bicycling environment without requiring dedicated space.

Bicycle boulevards and shared streets, in particular, often rely on network changes to create the low-speed, very low-volume conditions necessary for cyclists to feel safe and comfortable. Prohibiting through-traffic (requiring all motor vehicles to turn off the street at each intersection), either through physical diverters or signage, is an effective strategy for reducing speed and volume.

Changes to the motor vehicle network can open up opportunities for better bikeway designs. For example, converting a high volume or high speed street from two-way to one-way or removing all curbside parking can provide space for a protected bike lane.



Examples:

- **Bicycle Boulevard**
- **Time-of-Day Regulations**

Ames Street, CAMBRIDGE
(photo credit: People for Bikes)

Low-Speed, Low-Volume Roadways Can Be Shared

See the Urban Bikeway Design Guide *for detailed guidance on Bicycle Boulevards, Conventional Bike Lanes, Buffered Bike Lanes, and Left Side Bike Lanes.*

Bicycle Boulevards & Shared Streets

Bicycle boulevards and shared streets place bicycle and motor vehicle traffic in the same space at the same time. These facilities meet the All Ages & Abilities criteria when motor vehicle volumes and speeds are so low that most people bicycling have few, if any, interactions with passing motor vehicles.

What to do:

- **Use both peak-hour volume and off-peak speed** to determine whether a shared roadway can serve as an All Ages & Abilities bike facility. High peak period volumes or high off-peak speeds create a high-stress bicycling environment. These sources of stress can be addressed through speed management or volume management, or may indicate the need for a separated bicycle facility.
- **Set a 20 – 25 mph target speed (10 mph on shared streets)** for motor vehicles in the majority of urban street contexts. Use the 95th percentile motor vehicle speed, along with the overall speed profile of motor vehicle traffic, to determine whether high outlying speeds exist, since even small numbers of motor vehicles traveling at high speeds can degrade the comfort of people bicycling on shared roadways.
- **Manage motor vehicle speeds** through operational and network tools such as speed humps, pinchpoints, and neighborhood traffic circles.
- **Reduce motor vehicle volume** by constructing diverters, prohibiting through traffic, or removing parking. The All Ages & Abilities condition is likely to be reached below approximately 1,000 – 1,500 vehicles per day or approximately 50 vehicles per hour per direction.
- **Use time-of-day analyses** to match regulations or access restrictions to demand. Commercial setting can also work with bike boulevards if stressors are managed. Prioritize delivery and freight access off-peak, or allow only transit and bikes at peak periods.

SE Ankeny Street Bike Boulevard, PORTLAND
(photo credit: NACTO)

Brookline Street, CAMBRIDGE
(photo credit: City of Cambridge)

Conventional & Buffered Bicycle Lanes

Conventional and buffered bike lanes on urban streets delineate space for bicyclists but provide no physical separation between people bicycling and driving. With on-street parking, they also place the bicycle between parked vehicles and moving motor vehicles. Since bicyclists must enter the motor vehicle lane to avoid conflict with turning vehicles, parking maneuvers, double parking or curbside loading, or open doors, it is important for passing events to be minimized.

What to do:

- **Set target speeds at or below 25 mph.** Speeds of 20 – 25 mph improve comfort and allow drivers to more easily react when bicyclists need to move into the motor vehicle lane. Use strategies such as lower progression speed and shorter signal cycle lengths to reduce the incentive for drivers to speed, and reduce top-end speeding incidents.
- **Discourage motor vehicle through-movement to reduce volumes.** Lower motor vehicle volumes reduce the number of passing events. Depending upon the presence and intensity of other operational stressors, an All Ages & Abilities condition may be reached below approximately 3,000 – 6,000 vehicles per day, or approximately 300 to 400 vehicles per hour.
- **Reduce curbside conflicts**, especially freight, loading, and bus pull-outs (see page 15). Carefully manage loading activity and parking demand. On one-way streets with transit activity, move the bike lane or buffered bike lane to the left side of the street to alleviate intersection and curbside conflicts. On streets with heavy curbside use but low motor vehicle volume, consider moving truck traffic or curbside loading to other streets.
- **Address intersection conflicts** through motor vehicle turn prohibitions, access management, and signal phasing strategies. Due to the likelihood of both left- and right-turning conflicts from bi-directional motor vehicle traffic, use the same motor vehicle volume threshold on two-way streets as on one-way streets.
- **Increase buffer distance** where traffic characteristics adjacent to the bike lane decrease comfort, including large vehicles or curbside parking. Where adjacent sources of stress are present, a buffered bike lane can improve comfort by increasing shy distance between bikes and motor vehicles. Where multiple motor vehicle lanes, moderate truck and large vehicle volumes, or frequent transit indicate that most bicyclists will need more separation to be comfortable.

Separate Bicyclists When Speed & Volume are High

Protected Bicycle Lanes

Protected bike lanes (including raised bikeways) create All Ages & Abilities conditions by using physical separation to create a consistently exclusive, designated bicycling space. The physical protection offered by protected bike lanes means that they can often meet the All Ages & Abilities criteria even in higher speed, high volume, or unpredictable conditions. Protected bike lanes improve the overall organization of the street, and increase safety for people walking, bicycling, and in motor vehicles.

What to do:

- **Build protected bike lanes where motor vehicle speed consistently exceeds 25 mph,** where daily motor vehicle volume is higher than approximately 6,000 vehicles per day, where curbside conflicts are expected, or wherever there is more than one motor vehicle lane per direction.
- **Manage intersection and curbside conflicts** with transit boarding islands, protected (bend-out or offset) intersection designs, signal phasing, and other turn management strategies.
- **Reduce speeds through operational strategies,** such as signal time, lower signal progression, and shorter signal cycles.
- On streets with parking, **reverse the position of the parking and the bike lane to create physical separation** between the bike lane and moving motor vehicle traffic.
- On streets without parking, **add vertical separation elements** (e.g. delineators, barriers, raised curbs) in an existing buffer, or raise existing curbside bike lanes.
- On streets with multiple motor vehicle lanes in each travel direction, **convert one travel lane to a protected bike lane,** better organizing the street and improving safety for people biking, walking and driving.[22]
- **Convert conventional or buffered lanes to protected lanes** if motor vehicle speeds and volumes cannot be otherwise reduced and where there is high curbside activity or peaks of intensive demand such as retail-heavy streets, or around schools, large employers, institutions, and entertainment districts.

Second Avenue, SEATTLE
(photo credit: Adam Coppola for Green Lanes Project)

Strategies to Reduce Other Sources of Stress

In addition to motor vehicle speed and volume, All Ages & Abilities bikeway facility selection should respond to street conditions that increase bicycling stress and often degrade comfort and safety for all people using the street. These sources of stress can be addressed through design, operations, and network solutions that either remove the source of stress or separate it from bicycle traffic.

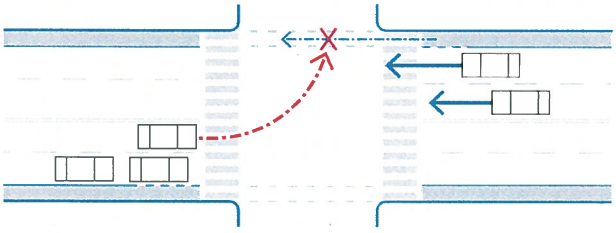
Multiple Motor Vehicle Lanes

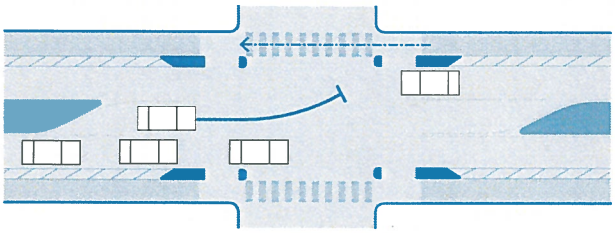
Source of Stress

Motor vehicle traffic on multi-lane streets, whether two-way or one-way, is less predictable than on streets with a single lane per direction of travel. Lane changes, acceleration and passing, and multiple-threat visibility issues degrade both comfort and safety. Corridors with a major through-traffic function and multiple motor vehicle lanes are inherently unpredictable biking environments.

Design Strategy

Reduce the cross-section to one motor vehicle travel lane per direction, where possible. On streets where multiple through lanes in one direction are used to allocate very high motor vehicle traffic capacity, provide physical protection and manage turns across the bikeway. 4-to-3 or 5-to-3 lane conversions paired with protected bikeways are transformative for both bicycling and walking safety and comfort.[23]





A common "multiple threat" conflict, where reduced visibility for motor vehicles turning across multiple travel lanes increase bicyclists' risk at crossings. The 4-to-3 lane conversion is a common technique for managing motor vehicle traffic flow while reducing the multiple threat conflict, though two-way left turn lanes introduce turn conflicts at mid-block locations (e.g. driveways).

Motor Vehicle Queuing

Source of Stress

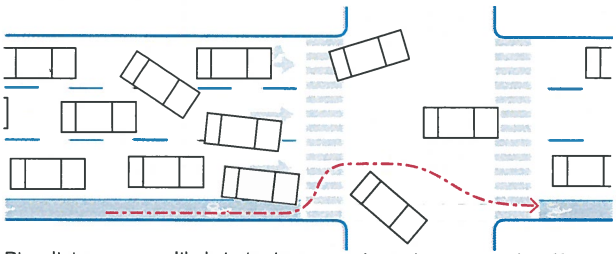
Motor vehicle congestion presents safety and comfort issues for people bicycling. Queued traffic moves at unpredictable speeds and will often invade conventional or buffered bike lanes.

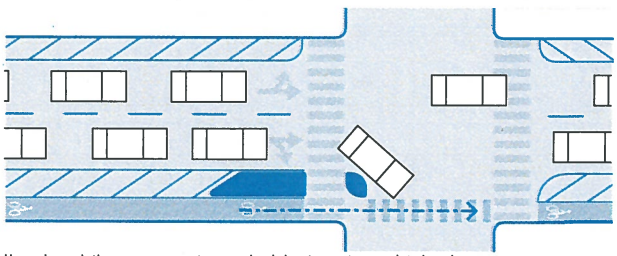
Design Strategy

Protected bike lanes should be implemented where motor vehicle invasion of the bike lane is likely to occur otherwise. Visual and physical barriers can prevent encroachment on the bikeway.

Queuing encourages both motorists and bicyclists to engage in unpredictable movements. Bicyclists may weave through queued cars when bicycle facilities are obstructed, where motorists are also prone to move unexpectedly.

Bicycle facilities should be designed with capacity for growing ridership, including passing of slow-moving cargo bicycles.

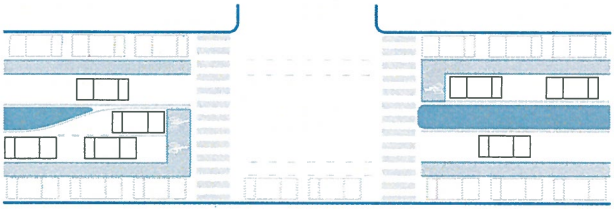
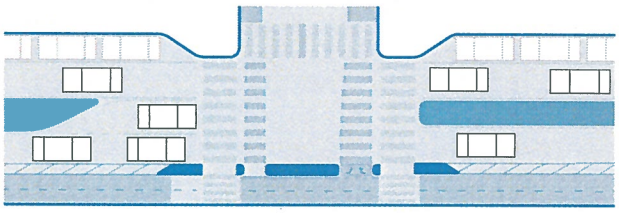




Bicyclists are more likely to try to weave through congested traffic, especially when bikeways are impeded, but motor vehicles become unpredictable. Separation and protection prevent queued vehicles from permeating bicycle space and maintain bikeway integrity throughout the day.

Strategies to Reduce Other Sources of Stress

Intersections

Source of Stress	Design Strategy
Motor vehicles turning across the bikeway typically require people bicycling to negotiate with motor vehicles, a significant stressor at all but the very lowest speed conditions. Bicycle design treatments that require people biking to cross or mix with motor vehicle traffic are stressful at all but low volumes.	Provide separation in space and time between bicycles and vehicles to the extent possible, or reduce speed and maximize visibility between drivers and bicyclists. Tighter effective corner radii, raised crossings, and protected intersection designs are effective in slowing motor vehicle turning speed and placing bicyclists in a priority position.
Bicycle left turns, especially on busy streets, can be very stressful or even dangerous for bicyclists, especially if bikes are expected to merge with fast-moving traffic or turn across multiple lanes.[25]	Provide appropriate intersection treatments to accommodate desired turning movements, including bike boxes, two-stage queue boxes, phase separation, or protected intersections (also known as "offset" or "bend-out" crossings) that organize and give priority to people bicycling.
	
Sharp grade or direction changes, such as sharp lateral transitions approaching the intersection, require people biking to slow down and may increase fall risks. Frequent starts and stops also create instability at intersections.	Reduce or mitigate situations that increase risk of falling and instability. Design intersection approaches and transitions with bicycle-friendly geometry; place bicycle movements first in the signal phase; time signal progressions to bike-friendly speeds; and rotate stop signs to face cross streets.

Trucks & Large Vehicles

Source of Stress	Design Strategy
High volumes of truck traffic degrade adjacent bicycling safety and comfort. This is often the case on major streets, or in commercial or industrial places.	Provide protected bicycle facilities—or, at minimum, buffered bike lanes—on observed or designated trucking routes, regardless of general motor vehicle speed and volume.
Large vehicles have large blind spots, increasing risk of side-swipe and right-hook crashes.	Use buffers to increase the distance between truck and bicycle travel paths. Consider protected intersection geometry (also known as "offset" or "bend-out").
Large vehicle noise and exhaust increase bicycling stress and present public health issues.	Provide wide lateral separation—such as with wide buffers, planters or planting strips, or parking-protected facilities—to dissipate pollutants entering the bikeway.[26]

Curbside Activity

Source of Stress	Design Strategy
Frequent freight and passenger loading either happens in the bikeway or adjacent in the curbside lane. Loading activities increase conflicts crossing the bike lane, or even blockages by double-parked vehicles that imperil bicyclists and rapidly decrease assurances of safety.	Provide designated truck loading zones and provide space for other curbside uses to prevent blockages of the bicycle lane. Consider restricting freight loading to off-peak periods. If frequent freight or passenger loading is observed, provide protected bicycle facilities regardless of speed and volume, or move passenger and freight loading uses to a cross-street.
High parking turnover results in frequent weaving and door zone conflicts.	Where parking turnover is high, provide protected bikeways regardless of speed to avoid sudden conflicts and reduce injury risk, or remove parking. Cities should establish local guidance on acceptable levels of parking maneuvers across bicycle lanes.
Freight loading is present throughout the day, but motor vehicle speed and volume are consistently low.	Implement a robust bike boulevard or shared street treatment with traffic calming strategies to provide comfort and safety across the entire roadway.
Car doors open into the bicycle travel path during vehicle exit and entry, but parking turnover is low to moderate.	Provide a wide marked buffer adjacent to the vehicle door zone to guide bicyclists clear of dooring conflicts for both buffered and protected bike lanes.

Frequent Transit

Source of Stress	Design Strategy
Buses merge across conventional bike lanes to access curbside stops. At all but the lowest bus frequencies, conventional "pull-out" transit stops degrade comfort and increase transit delay.	Provide spot protection using transit boarding islands, which are compatible with protected, buffered, and conventional bicycle lanes. Boarding islands create in-lane transit stops, which improve bus reliability and travel time.
Bikes and transit travel at similar average speeds but different moving speeds, as buses stop and accelerate frequently. Overtaking buses and bicycle leapfrogging decrease riding comfort in mixed conditions.	Provide dedicated bicycle facilities. On one-way streets, left-side bicycle facilities can be used to separate bikes and transit vehicles.
Core transit routes and trunklines often operate on streets with dense destinations and demand for bicycle access. In some cases, right-of-way width may constrain design decisions and facility types that can be implemented.	On trunkline transit streets, it is even more important to accommodate users in dedicated lanes, since the major streets are where people need to get to their destinations. If the primary demand for the corridor is through travel, it may be possible to consider providing high-quality bike infrastructure on parallel, nearby, and continuous routes, while allowing local bicycle access on the transit street. To improve All Ages & Abilities bicycling conditions, use low-speed signal progressions and other calming measures consistent with transit effectiveness. As on all transit routes, pedestrian safety is the foremost design need.

The NACTO *Transit Street Design Guide* provides detailed guidance for streets with frequent bus transit routes.

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EXHIBIT H

From: Dan Thorndike [mailto:dan.thorndike@medfab.com]
Sent: Wednesday, October 10, 2018 4:20 PM
To: Planning Department <planning@cityofmedford.org>
Subject: Transportation Plan 2018-2038 update -- written testimony

Dear Planning Commission Members:

I am a an owner of Medford Fabrication, a business that has been located in Medford for over 70 years at our Court Street and McAndrew Avenue site. I have long been a regular bicycle commuter, and we have had many employees over the years who either choose to – or must- come to work via bicycle. Frankly, it is neither easy nor safe to access our business by foot or bicycle. Dedicated bicycle and pedestrian facilities are either extremely limited or entirely nonexistent, particularly when seeking to travel either east or west. Traveling north and south is somewhat easier thanks to the Greenway, though the present conditions through the Hawthorne Park viaduct area prevent many from fully utilizing this resource. In any event, connecting to or from the Greenway from most of Medford is challenging at best. I am either stupid or stubborn enough to deal with these conditions, but most aren't.

If we seek to attract more families and young people to Medford – our future employees- we must provide safe and enjoyable bicycle and pedestrian facilities. Otherwise, they will locate elsewhere. The same goes for attracting the increasing number of tourists who focus on cycling opportunities – they'll simply skip Medford as they tour the valley.

Consequently, I urge the Planning Commission to use the TSP update as a means to seriously address the many obstacles facing bicyclists and pedestrians in Medford. Simply maintaining the status quo is unacceptable.

Thank you very much,

Dan Thorndike

Daniel C. Thorndike
General Counsel and Corporate Secty.-Treas.
Medford Fabrication
PO Box 1588
Medford, OR 97501-0244 U.S.A.

Serving the metal fabrication needs of local, regional, and international customers for over 70 years

EXHIBIT I

233 Days Until 2019 Fire Season

Public Testimony for the 10/11/18 Planning Commission
Public Hearing on the Transportation System Plan – update

Gary Shaff
516 Herbert St
Ashland, OR 97520

Good evening. You are being asked to endorse a Transportation Plan that ignores the elephant in the room. You may have read or heard about the recent United Nations report about climate change. But I know, with certainty, that you experienced the dangerous levels of smoke that we all endured earlier this summer. That's our future or worse, if we fail to control carbon emissions.

The transportation plan paints, what many would consider, a rosy picture. People driving their cars just as they do now and few choosing an alternative mode of travel. The Plan will make it all official. Medford is not going to reduce its reliance upon single occupant motor vehicle travel.

Welcome to Smokeford. Forget pears, forget grapes, forget tourists, and forget any hope of diversifying or growing the community. In fact, forget the need for more housing and, contrary to the forecasts included in the Transportation Plan, there will not be any need for additional roadway capacity.

You are faced with a choice. You can either 1) recommend adoption of the draft Transportation System Plan and its status quo approach to the future OR 2) you can do your job as a Planning Commission.

The overarching conclusion of the recent UN report is that every fraction of a degree of warming matters. Letting temperatures rise will exact a huge toll on lives, natural systems, and the economy. Fighting to keep warming in check — which will include radically and rapidly reducing … oil consumption, among other things — will save lives, the food supply, and homes.

Given those outcomes you must plan. Plan to make Medford less reliant upon single occupant motor vehicles. Stop building new capacity for motor vehicles and, instead, invest that money in a sustainable urban transportation system.

You must act now! According to the UN report "we may have as little as 12 years to act on climate change and slash global emissions by 45 percent.

Start by rejecting the current plan. Insist that it establish a goal for bicycle mode share (somewhere above 10 percent all travel in 2038). Provide for the modification and

reconstruction of the existing transportation system to make it safe and convenient for all modes so that EVERYONE can, on their preferred mode, travel to EVERYWHERE. The bicycle network must be equally "safe and convenient" to the existing motor vehicle transportation system.

The City's residents will ride bikes if the facilities are "safe and convenient." They've said as much in their response to the City's August 2017 survey. Almost 60 percent of those surveyed say they ride bikes but only 10 percent of those reported feeling safe riding on the City's streets. That is unacceptable. People are willing and will choose to ride bicycles as a mode of travel if the City's infrastructure for bicycles is "safe and convenient." This is a win – win proposition. Construct a "safe and convenient" bicycle network and the City's residents will use it.

How many? That is a question that can partially be answered by the experience in Portland. Through that city's construction of a safe and convenient bicycle network, they have grown their bike mode share from just 2 percent in 2000 to seven percent in 2015. But even more impressive, Portland's transportation plan includes a goal of 25 percent bike mode share by 2035. Medford's goal should be at least 10 percent.

A 10 percent bike mode share would reduce the region's transportation sector carbon emissions by 10 percent. That is a huge deal. You must full-fill your responsibility to PLAN and ensure that the City does everything to protect its future. We can't afford any delay.

Our future and the future of our children and their children is at risk. Please plan so that they can grow to love and cherish the place we call home. Thank you.

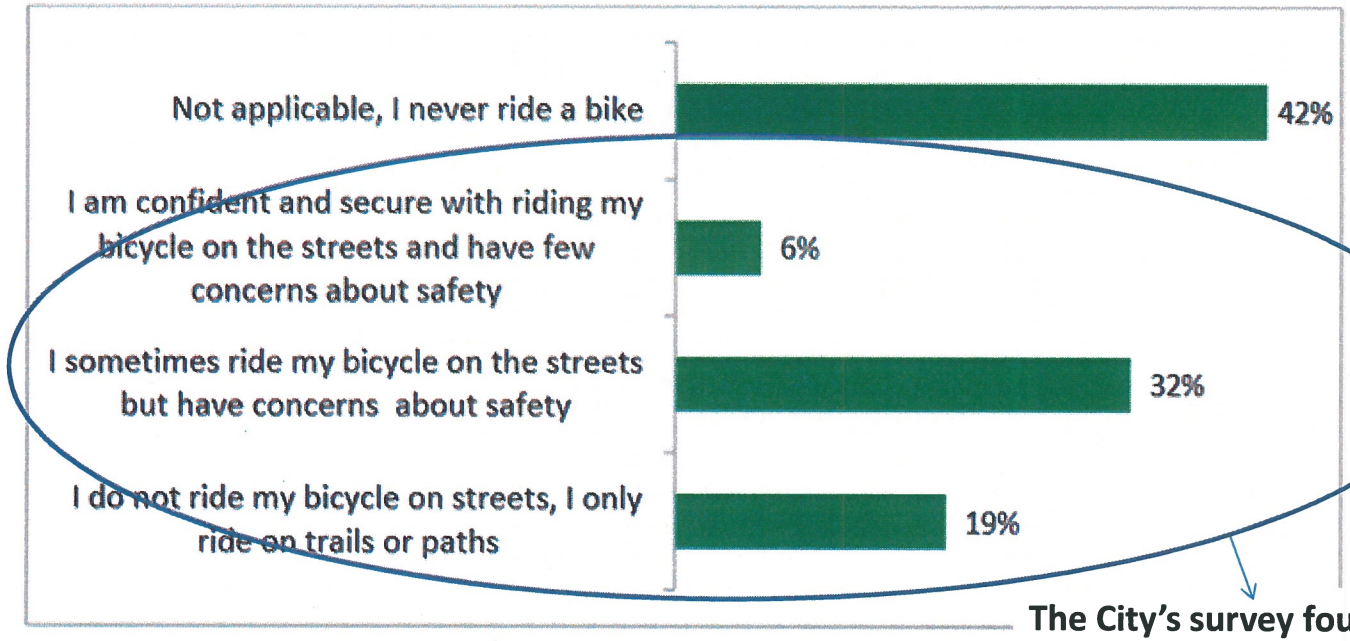
Please include the following as a part of my testimony:

1) A Global High Shift to Cycling Scenario
2) Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany

Who Rides Bicycles in Medford

Question 17 –Bicycle Use Comfort Levels (1,033 answered, 9 skipped)

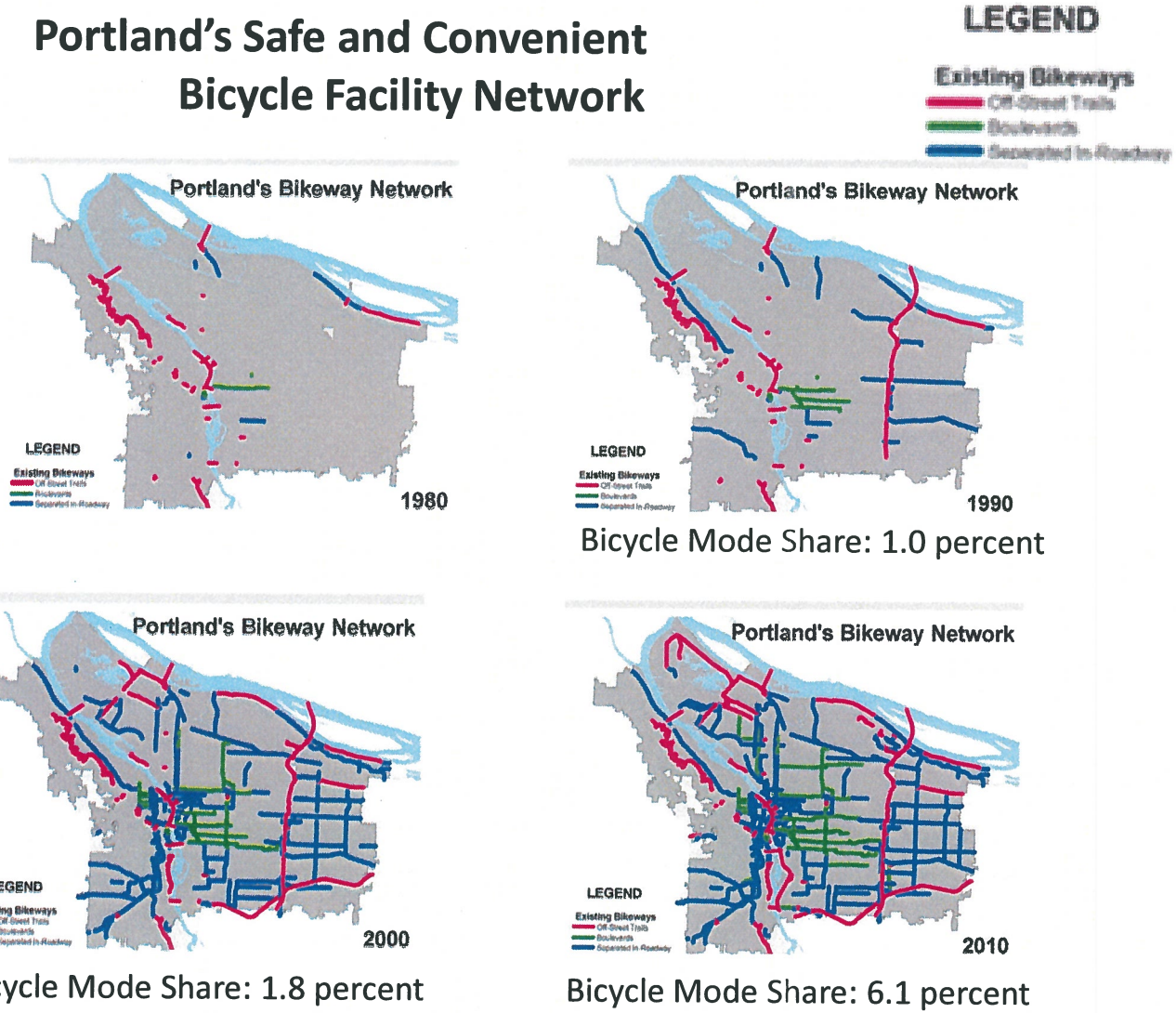
Which of the following best describes how you feel about bicycling on the streets in Medford?



Source: Summary of Medford Transportation Survey, City of Medford, August 2017

The City's survey found that almost 60 percent of Medford residents ride bikes.

Portland's Safe and Convenient Bicycle Facility Network



Portland has established, in its transportation plan, a 25% mode share for bikes by 2035.

ITDP Institute for Transportation & Development Policy

ITS UCDAVIS INSTITUTE OF TRANSPORTATION STUDIES

A Global High Shift Cycling Scenario:

The Potential for Dramatically Increasing Bicycle and E-bike Use in Cities Around the World, with Estimated Energy, CO_2, and Cost Impacts

12 November 2015

By the Institute for Transportation & Development Policy
and the University of California, Davis

Jacob Mason, Lew Fulton, Zane McDonald

Research commissioned by the Union Cycliste Internationale (UCI),
the European Cyclists' Federation (ECF), and the Bicycle Product Suppliers Association (BPSA)

UCI UNION CYCLISTE INTERNATIONALE

ECF EUROPEAN CYCLISTS' FEDERATION

bpsa

Authors

Research commissioned by

Acknowledgments

The authors wish to thank Union Cycliste Internationale (UCI), the European Cyclists' Federation (ECF), and the Bicycle Product Suppliers Association (BPSA) for their generous financial support that made this research possible, particularly our primary contacts there, Chris Peck, Kevin Mayne, and Bob Margevicius. We also thank the individuals who participated in meetings of the advisory committee for this study, providing data and insight on cycling and e-bike use around the world. Members of that group include Christopher Peck, Kevin Mayne, Carlofelipe Pardo, Christopher Cherry, Bob Margevicius, Michael Replogle, Randy Neufeld, Alejandra Leal, Geetam Tiwari, and S. K. Jason Chang.

Without that support we would not have had the data or insight to conduct the global level of scenario building and analysis that was completed. Finally, the authors thank all the members of the Research Team at UC Davis who carried out much of the data gathering, data cleaning, and data refinement and analysis work. We thank also the contributions of Stephen Robert Kulieke and Katie Rustad of UC Davis and Jemilah Magnusson, Gabriel Lewenstein, and Aimee Gauthier, of ITDP, and Zoé Kruchten and Elina Baltatzi of ECF who helped manage strategic communications.

There are many other people too numerous to name who helped this project succeed and we thank them. Of course the flaws in the end product are the responsibility of the authors alone.

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Executive Summary

Cycling plays a major role in personal mobility around the world, but it could play a much bigger role. Given the convenience, health benefits, and affordability of bicycles, they could provide a far greater proportion of urban passenger transportation, helping reduce energy use and CO_2 emissions worldwide.[1] This report presents a new look at the future of cycling for urban transportation (rather than recreation), and the potential contribution it could make to mobility as well as sustainability. The results show that a world with a dramatic increase in cycling could save society US$24 trillion cumulatively between 2015 and 2050, and cut CO_2 emissions from urban passenger transport by nearly 11 percent in 2050 compared to a High Shift scenario without a strong cycling emphasis.

The report builds on the 2014 study *A Global High Shift Scenario: Impacts and Potential for More Public Transport, Walking, and Cycling with Lower Car Use*. That report provided a global assessment of the potential for increasing travel on sustainable, efficient modes while concurrently developing cities that are far less car-dependent. However, the role of cycling in the previous study could be considered relatively minor, with the global average urban mode share increasing by three percentage points in 2030 (from 3 to 6 percent of total travel).[2] A number of supporters/users and contributors to the previous report felt that the role of cycling might have been understated in that study. The authors recognized that those comments might be valid because within the wider study there was limited capacity to consider cycling in detail. This report explores just how much is possible if we study cycling in more detail using the same approach. The result is the most comprehensive picture ever of global urban cycling activity.

Both the 2014 study and the High Shift Cycling Study focus on urban areas, which are projected to have the greatest growth in demand for travel. Given the higher densities of people, services, and jobs that are possible in cities, as opposed to rural areas, cities inherently have the greatest potential to direct the growing demand for travel to sustainable modes and to cycling in particular.

This study uses the same basic methodology as the previous study, including the development of business-as-usual and high shift scenarios. However, it provides a number of new contributions over the previous study. We have:

- Undertaken a bigger effort to collect and tabulate data on cycling and electric bicycle (e-bike) ridership around the world, finding higher ridership levels than previously estimated;
- Developed better estimates of recent cycling trends by region;
- Created the new High Shift Cycling (HSC) scenario for 2030 and 2050, taking into account cities that currently have high cycling levels, typical trip distances, and other factors;
- Reestimated the potential impacts of high cycling and e-biking levels on energy use, CO_2 emissions, and a range of cost factors.

Cycling and E-biking: Status and Potential

The extensive data collection undertaken for this project reveals that more cities and countries than previously considered already have high cycling (and e-bike) mode shares. Based on our new database, it is estimated that in 2015 bicycles/e-bikes account for about 6 percent of urban trips worldwide. However, more than half of documented cycling trips occur in China, Japan, and a few European countries such as the Netherlands and Denmark. In the United States and Canada urban cycling is estimated to account for only about 1 percent of trips. (These values include only utility trips such as commuting or shopping—not recreational cycling.) Recent trends suggest that mode shares and cycling levels per capita

are at best increasing slowly in most of the developed world, and are declining in many industrializing countries. These trends are preserved in our BAU scenario, leading to a mode share that is relatively unchanged worldwide by 2030.

Yet in considering the bigger potential for increasing cycling levels in the future, the more successful cities today can serve as models. Cities such as Amsterdam and Copenhagen are well known, though York in the United Kingdom; Davis, California; and many cities in India, China, and other countries around the world have cycling mode shares well over 15 percent of trips.[3] Not all cities may be able to reach such levels, but there is one fact that suggests that the potential is large: in cities and countries where data is available, typically more than half of all trips are less than 10 kilometers.[4] Even in the United States more than 35 percent of trips are less than 5 kilometers, a distance typically covered in twenty minutes or less. A number of such trips should be "cyclable" for many, or at least amenable to travel via e-bikes. The question becomes how to unlock this potential. If it can be unlocked, the benefits will be substantial.[5]

Key Results of the New High Shift Cycling Scenario

Through a range of policies and investments described in this report, the HSC scenario achieves an 11 percent combined cycling/e-bike share of urban passenger travel distance worldwide by 2030, compared to a base share of 6 percent. By 2050 in the HSC scenario, cycling and e-bikes should account for 14 percent of urban kilometers of travel, ranging from about 25 percent in the Netherlands and China to about 11 percent in the United States and Canada. Figure ES-1 presents the mode share results for Organisation for Economic Co-operation and Development (OECD) and non-OECD countries, cycling and e-bikes, in 2015, 2030 BAU and HSC, and 2050 BAU and HSC. This shows strong increases in both OECD and non-OECD in the High Shift Cycling scenario compared to slow growth (OECD) or decline (non-OECD) in the BAU.

We have quantified three important aspects of the high shift to cycling and e-bikes: energy use, CO_2 emissions, and direct costs to travelers (including vehicle purchase, operation, and related infrastructure costs). This is, however, an incomplete picture of total societal costs and benefits from increased cycling. There is a wide range of other impacts that can be expected from this scenario, many of which are difficult to quantify and have not been included in this report. Increased cycling is associated with higher rates of physical activity, reduced air pollution, lower traffic congestion, and calmer urban traffic that can reduce road-crash-related fatalities and injuries. These benefits could be investigated and quantified in follow-up research.

In summary, the increase in cycling/e-biking around the world by 2030 in the HSC scenario cuts both energy use and CO_2 emissions from the entirety of urban transport by about 7 percent compared to a High Shift scenario without a strong cycling component, rising to a near 11 percent reduction by 2050. Under current trends CO_2 from urban transport will soar from 2.3 gigatonnes of CO_2 in 2015 to 4.3 gigatonnes by 2050. Under the HSC scenario, including

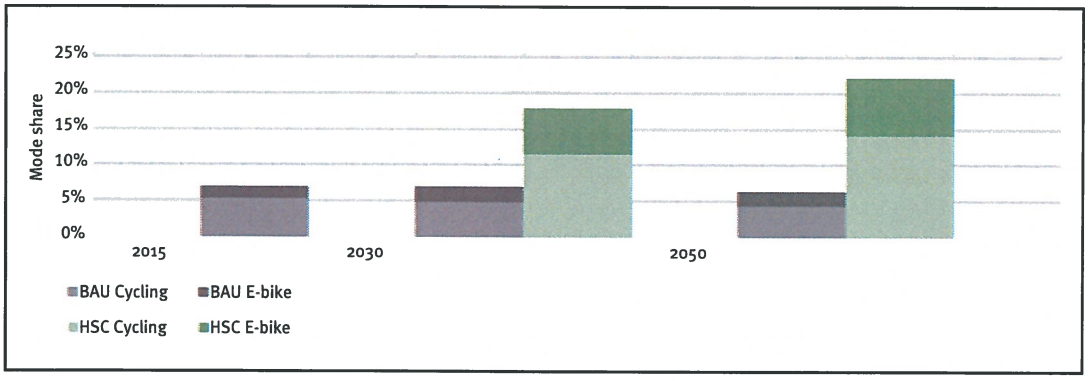


Figure ES-1. Global Mode Shares of Cycling and E-biking by Year and Scenario

Note: "Mode share" refers to the percentage of urban trips, "BAU" refers to business as usual and "HSC" refers to High Shift Cycling.

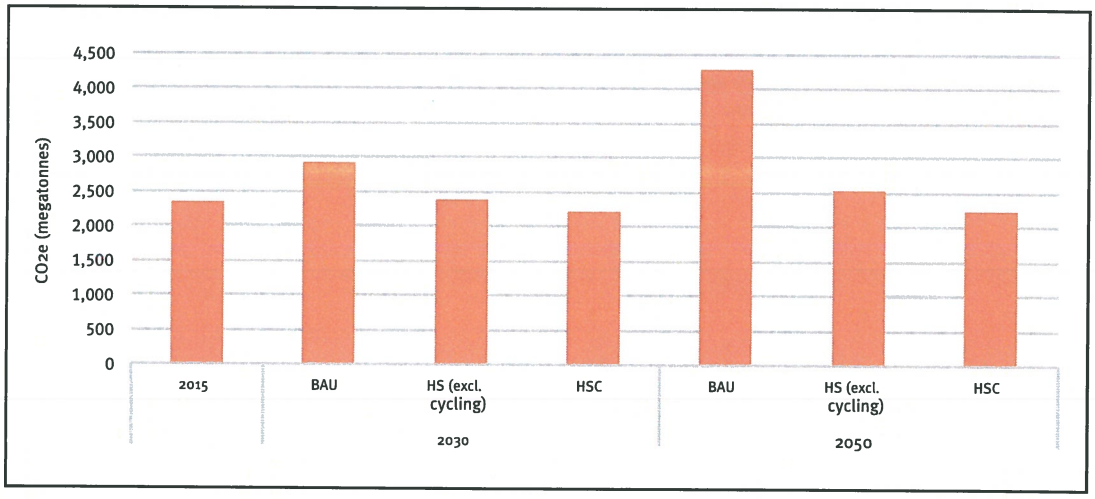


Figure ES-2. Yearly CO_2 Emissions from urban passenger transport worldwide in the BAU, HS, and HSC scenarios

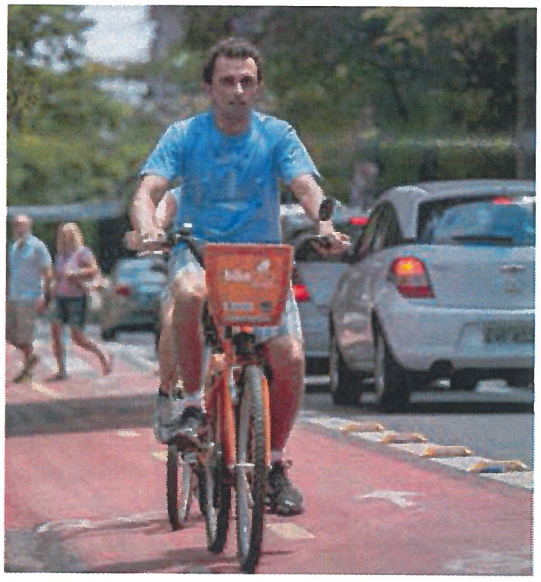
the impact from increased public transport use, this figure could be cut in half, potentially resulting in a 2 gigatonnes reduction in CO_2 emissions per year by 2050.

The increase in cycling and e-bike use would save the world a cumulative US$6 trillion between 2015 and 2030, increasing to US$24 trillion between 2015 and 2050. Thus a future with a dramatic increase in cycling would not only reduce CO_2 emissions and energy use, but would save the world an enormous amount of money compared to a BAU future.

Conclusions/Recommendations

This analysis shows that cycling can have a substantial positive impact on the world's future, saving US$24 trillion dollars over the next thirty-five years and dramatically improving quality of life for the world's rapidly urbanizing population. Benefits also include an 11 percent annual reduction in urban transport CO_2 emissions by 2050 over the High Shift scenario without a strong cycling component, as part of a broader 50 percent reduction from the entire set of changes in the HSC scenario versus the BAU scenario. Given the growing threat of global climate change, the authors recommend that actions be taken at the municipal, national, and global level to help realize such a scenario.

In upcoming climate negotiations, the authors recommend that countries include specific commitments for cycling, including mode share and infrastructure investment targets. E-bikes play a critical role in the HSC scenario, but there are a range of issues that must be addressed for e-bikes to succeed as a mass mode in many countries. These include safety and cost. Governments should encourage and subsidize low-powered, speed-limited e-bike usage while placing direct restrictions on high-polluting gasoline motorbikes.



Bike Share Users on São Paulo's New Bicycle Infrastructure. With these policies, governments will be able to quickly increase the amount of cycling, walking, and public transport use and achieve the benefits of an HSC scenario.

To meet ambitious cycling targets and achieve the resultant benefits, strong policies must be adopted at both the local and national levels of government. The recommendations below are based on the policies adopted by cities and countries that have achieved high and sustained levels of cycling as a percentage of urban travel. To achieve an

HSC scenario, governments should:

- Rapidly develop cycling and e-bike infrastructure on a large scale;
- Implement bike share programs in large- and medium-size cities, prioritizing connections to transit;
- Revise laws and enforcement practices to better protect people cycling and walking;
- Invest in walking facilities and public transport to create a menu of nonmotorized transport options that can be combined to accommodate a wide variety of trips;
- Coordinate metropolitan transport and land-use plans, so that all new investments result in more cycling, walking, and public transport trips and fewer trips by motorized vehicles;
- Repeal policies that subsidize additional motor vehicle use, such as minimum parking requirements, free on-street parking, and fuel subsidies;
- Encourage cycling and active transport via pricing policies and information campaigns;
- Adopt policies such as congestion pricing, vehicle kilometers traveled (VKT) fees, and development impact fees to charge a price for driving that accounts for negative externalities;
- Dedicate fuel taxes, driving fees, and other transport-system revenues toward investment in sustainable transport.

1. Introduction

In 2014, the study A Global High Shift Scenario: Impacts and Potential for More Public Transport, Walking, and Cycling with Lower Car Use examined a global scenario for dramatically increased personal travel by sustainable, efficient modes, including walking, cycling, and public transportation. The study showed that urban passenger transport CO_2 emissions could be reduced by 40 percent in 2050 and that US$100 trillion could be saved globally between 2015 and 2050 by investing in sustainable transportation compared to the BAU scenario, which was based on the International Energy Agency (IEA)'s 4°C Scenario.

This study expands the 2014 analysis to examine whether additional data and evidence support a much higher HSC scenario for bicycle and e-bike use around the world. Cycling was singled out for a more detailed analysis, given its versatility and range. Consistent with the previous study, only "utility" cycling (such as commuting or shopping trips, rather than recreation or sport) was included in the HSC scenario.

Further, as in the previous study, we have concentrated this study on the use of bicycles and e-bikes as a utility trip choice within urban agglomerations. This maintains consistency, although we acknowledge that a considerable amount of cycling also takes place in rural areas.

Within the urban context it is estimated that typically more than 50 percent of urban trips are less than 10 kilometers, a distance easily covered by bicycle.[6] Since bicycles are highly space efficient, they require far less infrastructure and urban space than automobiles, allowing for improved mobility in densely populated urban areas.[7] Bicycles move at speeds far lower than motorbikes, resulting in dramatically safer mobility.[8] Cycling and e-bike use also produce little or no greenhouse gases or local air pollutant emissions, making them much cleaner alternatives to motorbikes, which often produce high levels of emissions.[9] With the spread of speed-restricted e-bikes,

New Study versus 2014 Study

The HSC study builds on last year's High Shift Scenario report, with a more detailed examination of the potential contribution of cycling and e-bikes. This required making a few adjustments to the analysis to aid comparison:

- The most important change was to remove cycling from the impacts of last year's HS scenario, and report the HS scenario including only the BAU level of cycling. Thus, in this report, the 2014 study HS results are slightly lower than those published in last year's report;
- Second, the BAU for cycling was updated for the 2014 HS scenario based on the BAU developed in this study, so that the two BAUs match. This BAU is higher than last year's, since we somewhat underestimated base year cycling mode shares last year;
- Finally, the new HSC scenario was developed, with far higher cycling and e-biking levels than in last year's HS scenario.

Presenting all of this information posed something of a challenge, but throughout this report we refer mainly to three scenarios: the revised BAU, last year's HS scenario (with BAU cycling), and the new HSC scenario that shows the full impact of high cycling over what is achieved without it. In some places we focus on the marginal impact of cycling by comparing HSC to last year's HS; in others we show the impact of HSC compared to the BAU, which includes the benefits from cycling along with very high public transport ridership, and other high shift benefits.

cycling is becoming a more appealing option for a wider range of people and trip lengths, and in a greater variety of locations, such as hilly cities.5 Higher levels of cycling result in more exercise and a healthier population, reducing mortality rates from heart disease, and lowering levels of obesity—a rapidly growing problem throughout much of the world.[6]

The experience of the Netherlands, Denmark, and Japan shows that wealthy countries can achieve both a high rate of cycling and a high quality of life, but only if transportation policy and urban development patterns strongly support bicycle use and sustainable transportation.[10] With the approaching 2015 United Nations Climate Change Conference, also known as COP 21, there is a unique opportunity to commit global policy toward a future based on expanded cycling and sustainable transportation. The transportation sector currently accounts for nearly 25 percent of all carbon emissions, with urban passenger transportation emitting nearly 2.3 gigatons of CO_2 in 2010. Reducing carbon emissions in the urban transportation sector is a key part of achieving a two-degree scenario, where catastrophic climate change is largely avoided. If countries adopt aggressive sustainable transportation goals as part of the COP 21 negotiations, the world has a greater chance of achieving that scenario.

This report details the potential policies needed to reach an HSC scenario. The policies are based on examples of successful programs in cities and countries that have achieved both high levels of income and high levels of cycling. Unlike expensive policies needed in other sectors to reduce the severity of climate change, as this report shows, the policies necessary to reach an HSC scenario can dramatically reduce societal costs, freeing money for use in other endeavors.

2. Cycling Around the World Today—Data and Baseline Setting

To develop and assess future scenarios of cycling we first needed to understand the existing picture of urban cycling by compiling data on the extent of current cycling trends in countries around the world. From this data we established a baseline (2015) picture of cycling and identified key factors influencing it. The following section outlines the raw data we were able to collect and how it was analyzed to craft a platform on which projections about future cycling growth could be built. This platform, in the form of our estimates for 2015, is referred to as the "baseline," and is representative of how cycling is being used as a utility mode of transportation throughout the world (the analysis does not consider recreational use). The data has also been used to estimate trends and to develop a BAU scenario, which is presented in the next section.

The authors conducted a wide ranging data search focused on cycling levels per capita, average urban mode shares, bike sales and stocks, extent of infrastructure (such as bike lanes and bike sharing systems), and bike-related costs (including bicycle purchase and maintenance costs as well as infrastructure construction and maintenance costs). By far the most readily available data across the most countries and the most years has been bicycle mode share data. Other data have been spotty outside of Europe. Thus mode share was used as the primary means of establishing a 2015 baseline for cycling. The detailed database will be made available concurrent with the launch of the report.

Bicycle Mode Share Data

The authors obtained sufficient data on cycling mode share to estimate average cycling mode shares for twenty-one countries and regions based on social, economic, and climatic similarities. A few small, exceptional cycling countries (such as the Netherlands and Denmark) were pulled out to ensure that they received specific attention.

The authors and the expert panel were sensitive to the fact that there is inconsistency in the calculation of mode share, even from city to city within the same country. However, the size of the data set (more than eight hundred cities) provides some confidence in average numbers and a means of comparing relative levels of cycling between cities and tracking changes over time. Nonetheless, a key recommendation of this report is to create improved data definitions and collection systems to better document the baseline situation and to track changes over time.

Key highlights include:

- Russia was included in non-OECD Europe due to a lack of Russian data;
- Six EU countries were analyzed separately, given the excellent data availability: the Netherlands, Denmark, France, Germany, Italy, and the United Kingdom;
- Japan was pulled out of OECD Pacific to highlight extraordinary cycling levels;
- In each region, we separated large cities from smaller ones and estimated the mode share for these two city sizes;
- We tracked the dates of data (which ranged from 1977 to 2015) and created a very rough system of time trends where this was possible.

Table 1 shows the data development process and final estimation of mode shares by our most detailed country/region breakout. This includes the percentage of large and smaller cities covered in each region (that is, the percentage represented in our database); for many regions we have near 100 percent coverage for larger cities, meaning at least one year of data of cycling mode share in each large city in those regions. For smaller cities the coverage is typically far lower, indicating much greater uncertainty in the average mode shares in those cities. The table also shows the weighted mode share, taking into account large and small city mode share and the assumption that cities without data are on average 25 percent below the average taken for the cities with available data (based on

		>300k Cities		<300k Cities				
City Count	Region	Percent Coverage	Mode Share	Percent Coverage	Mode Share	Weighted City Mode Share	Years to 2015	2015 Mode Share
12	Denmark	100%	0.45	61%	0.18	0.23	9	0.25
40	France	95%	0.04	15%	0.02	0.02	9	0.04
68	Germany	100%	0.13	19%	0.14	0.12	8	0.13
18	Italy	39%	0.09	7%	0.16	0.10	11	0.12
31	Netherlands	100%	0.28	44%	0.26	0.23	8	0.25
24	Nordic	100%	0.13	29%	0.18	0.14	8	0.16
33	United Kingdom	61%	0.03	14%	0.05	0.03	7	0.04
108	Other OECD Europe	55%	0.06	15%	0.08	0.06	7	0.07
52	Japan	100%	0.17	14%	0.15	0.17	17	0.16
23	Other OECD Pacific	27%	0.02	18%	0.02	0.02	3	0.02
347	United States	95%	0.011	60%	0.012	0.01	5	0.02
14	Canada	56%	0.03	13%	0.01	0.02	5	0.03
14	Mexico	27%	0.02	0%	0.00	0.02	1	0.02
5	Brazil	9%	0.03	0%	0.00	0.02	1	0.02
33	Other LAC	25%	0.03	2%	0.05	0.03	5	0.02
10	Africa	5%	0.06	0%	0.00	0.05	9	0.03
29	Non-OECD Europe/Russia	9%	0.03	4%	0.04	0.03	5	0.02
2	Middle East	1%	0.08	0%	0.02	0.04	9	0.03
24	China	6%	0.25	0%	0.00	0.19	10	0.10
29	India	16%	0.17	0%	0.01	0.08	7	0.07
2	Other Asia	3%	0.03	0%	0.00	0.02	3	0.02

Table 1. Development of baseline cycling modes data by country/region.

Notes: "City count" = number of cities for which data was obtained. "Percent coverage" = percentage of cities within size class for which data was obtained. "Weighted city mode share" includes adjustments for both large/small city weights, and for percentage of cities without data, as described in the text. "Years to 2015" = number of years from average year of data until 2015, used in adjusting data to base year.

the expectation that cities that make data available are likely to be somewhat above average for cycling mode share). Finally, Table 1 also brings the average mode share up to 2015, based on the estimated trend and the average year of available data. The final 2015 mode shares are shown in the far right-hand column.

Figures 1a and b (next page) show the progression of urban population-weighted averages at the regional level from their average source year to the baseline year of 2015 (without adjustments for missing data). The number of cities covered by the data is shown as labels above each column. Approximate trends in data were used to determine if a region was experiencing growth or decline in cycle utilization. Although many periods in different regions have limited data, approximate trends are evident. Despite variations in individual countries, it was determined that OECD regions would trend toward growth in the baseline, while non-OECD regions would experience a fall in cycling use. The trends for future bicycle mode share in the BAU scenario are described in greater detail in Section 3.

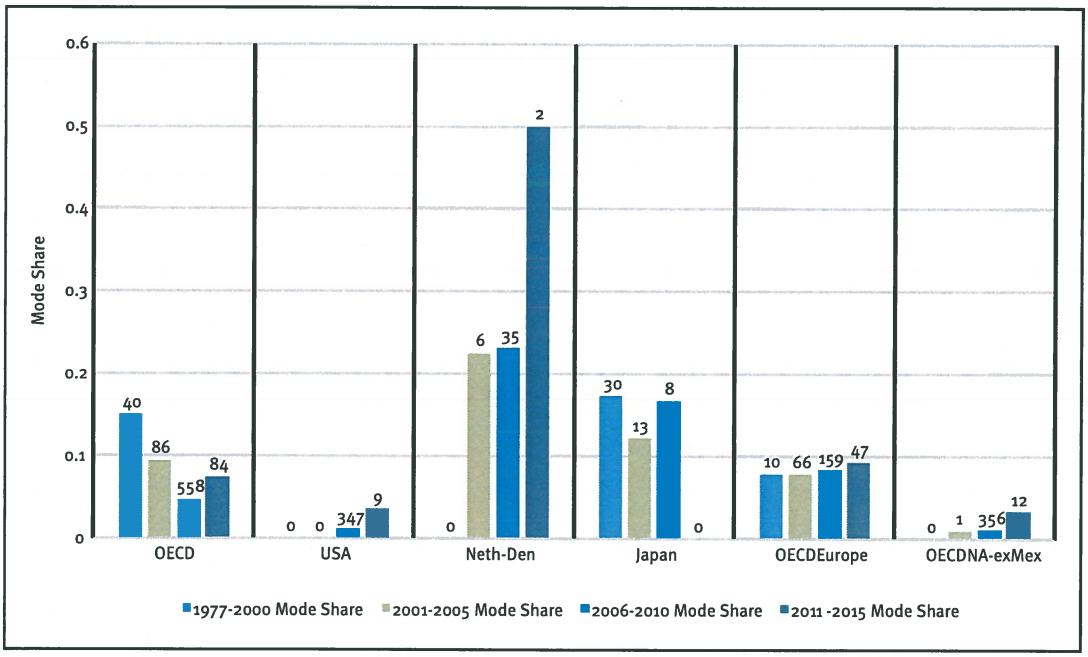


Figure 1a. Average mode share estimates for different time periods, for selected OECD countries and regions.

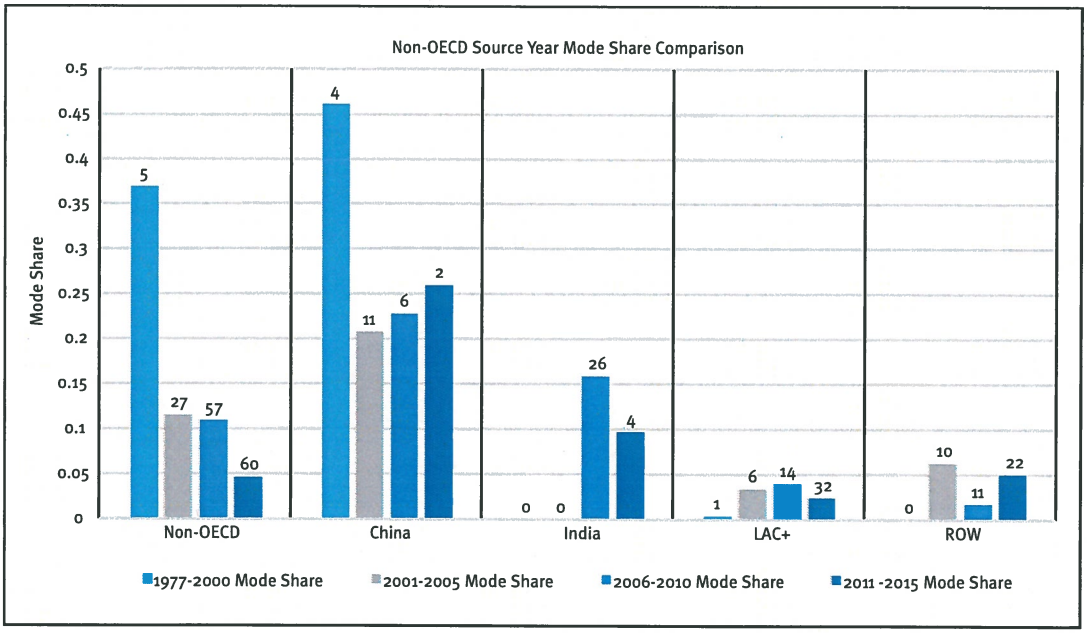


Figure 1b. Average mode share estimates for different time periods, for selected non-OECD countries and regions.

Note: The number of cities included in the average is shown above each column.

E-biking

Global e-bike usage presented a particular challenge to developing a baseline. As an emerging technology, e-bikes are not included in mode share reporting by all but a few cities. Instead, global/regional e-bike sales data was used to estimate e-bike usage within each region. We used the European Cyclists' Federation (ECF) sales data (discussed below) through 2015 in various regions around the world as well as average VKT on e-bikes per year and average trip length to derive person-kilometers of travel (PKT) and trips/capita estimates.[11] This was converted into mode share data by comparing these trip estimates to trips by other modes.

It should be noted that there are a variety of e-bike types and technologies, and these are not differentiated in this study. But some types (such as predominate in China) do not require any pedaling, whereas others (predominating in Europe) require pedaling and either simply add electric power to each pedal stroke or allow the user to "top up" pedal power at the turn of a hand grip. The strengths and weaknesses of these different technologies, and their costs, vary and could be the subject of follow-up analysis. Figure 2 shows the aggregate baseline mode share for each region in the study with the darker top representing the portion of the mode share occupied by e-bikes. A more detailed discussion of e-bikes is provided in the sidebar on p. 14.

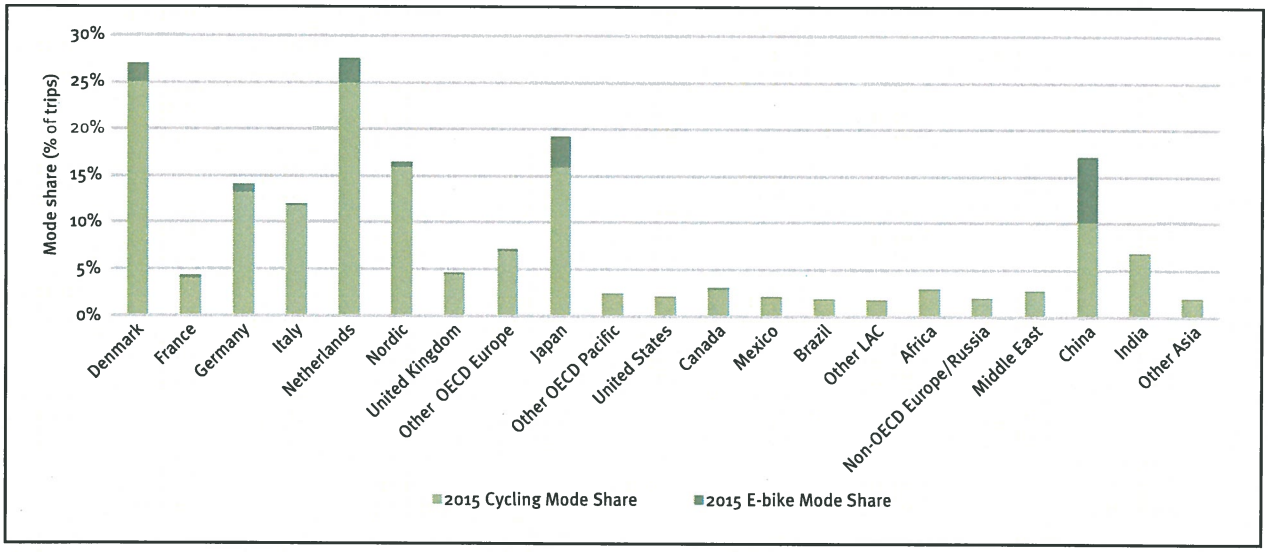


Figure 2. Aggregate, adjusted Baseline mode shares for bicycles and e-bikes, 2015.

E-bikes

Electric bicycles (e-bikes) provide a wide range of benefits, which include increasing the range of potential travel distances, reducing cycling effort in hilly cities, and providing mobility to population groups that are not entirely comfortable using bicycles. While there have been complaints of discomfort from users of non-assisted bicycles, and some Dutch cities have found that elderly population has a greater risk of crashes when using e-bikes, restricting the speeds of ebikes to a locally agreed maximum safe speed can help avoid safety issues

E-bikes come in many shapes, sizes, and price points around the world, and may play different roles depending on the specific technologies and types of bikes in question. For example, some are speed limited at 25 kilometers per hour; others are capable of going twice that speed. Some use electricity to assist pedal power, others use only electricity—pedaling is not even possible (as is prevalent in China). Most e-bikes in the developing world use heavy lead-acid batteries (very polluting and toxic), while those selling in Europe and North America are mainly lighter (and much more expensive) models with lithium-ion batteries.

There has been a rapid increase in the use of e-bikes in both developed and developing countries, with varying regulations regarding approved use and/or downright bans. Some countries have regulated these vehicles to the extent that only the "best" types of e-bikes can circulate on bikeways (all others can only use regular streets—this is the case in most of Europe), other places do not differentiate the types of e-bikes or whether they are a different type of vehicle (most of Latin America), and some places (like some Chinese cities) have begun to ban e-bikes altogether due to safety concerns stemming from the heavier, higher speed e-bike models more common there.

In this study, we try to remain "technology neutral" but point out the need for e-bikes to be affordable yet safe all over the world. Many policy issues are in play in different countries and regulations are still being developed. But it seems reasonable to urge that e-bikes be regulated to be as safe as possible (that is, with speed governors set to locally or nationally agreed safe speeds, and greater access/circulation to those that use pedal assistance instead of throttle power), and designed to be as competitive price-wise as possible with internal-combustion engine two-wheelers.

While lithium-ion batteries have superior performance, e-bikes equipped with these batteries currently cost up to US$1,000 more than those with lead-acid batteries (though economies of scale may eventually make these much more affordable, and appropriate in more countries). Countries should "move up the ladder" of technology as makes sense given the local economy, while ensuring safety.

Bicycle and E-bike Sales

Although there appears to be reasonably good data for e-bike sales worldwide, data on sales of regular (nonmotorized) bicycles is poor for much of the world. Figure 3 presents available data, amounting to about thirty-four million bicycles in the countries shown, although we roughly estimate that, given our data on cycling mode share, total world sales probably amount to more than a hundred million per year. E-bike sales in 2015 are estimated to reach forty million in all world regions, with China the dominant country but also with significant sales in Japan and Europe. As mentioned above, e-bike sales data were used to generate estimated e-bike travel levels, but bicycle sales data were not. In addition to the poor data coverage, the sales data include a potentially large number of bicycles used for purposes other than utilitarian travel, such as recreational use or racing. However, sales of utilitarian cycles were separately estimated in relation to cycling mode share and travel, and sales were then adjusted in each scenario in proportion to travel.

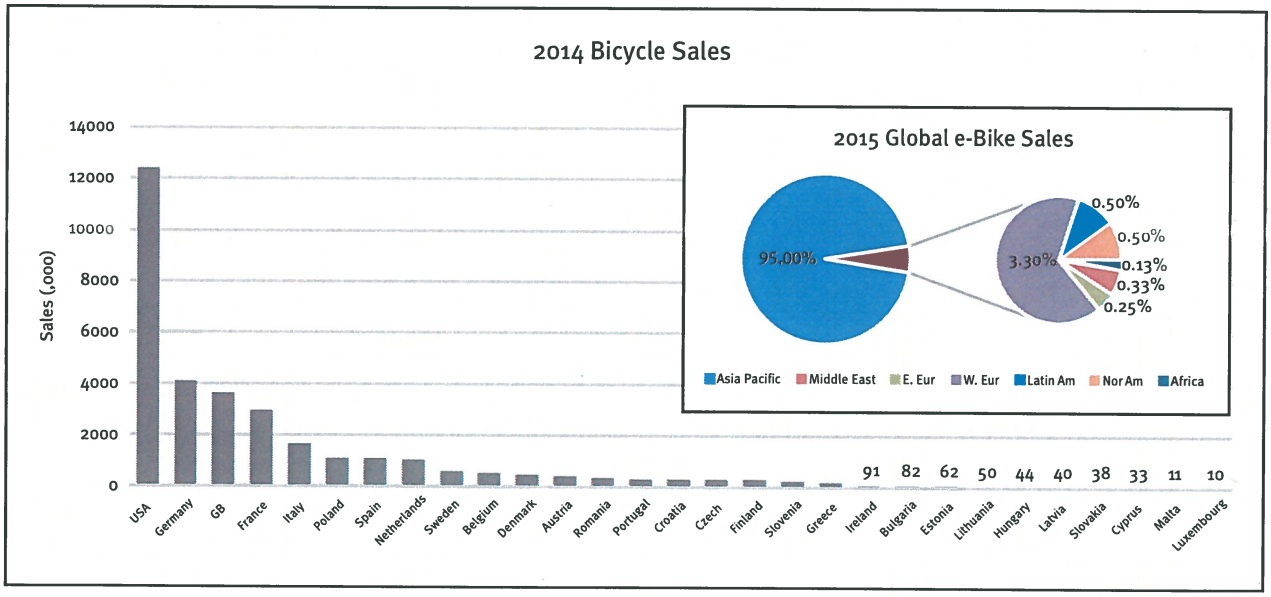


Figure 3. Bicycle and e-bike sales for most recent year.
(Bar chart shows bicycle sales in 2014, including recreational as well as utilitarian, for countries with available data; the inset pie charts show e-bike sales shares by major world region, 2015.

Bike Sharing

Bike sharing is a recent urban development that allows consumers to rent a publicly owned bicycle from a bike sharing station, use the bike while paying a fee per time used, and return the bike to any other station operated as part of the same system, allowing point-to-point trips. Typically, the initial thirty to forty-five minutes of use are free of charge, although other payment plans are in use. Although there is not a direct correlation between cycling mode share and the adoption of bike sharing, these systems play an instrumental role in the social acceptance of cycling by placing bikes in high visibility locations and making them easily accessible to large numbers of people. They can serve as a gateway for an otherwise apprehensive biker as well as an extension of public transport systems.[12] In order to craft a more complete picture of the role of cycling in the baseline year, a database of current Bicycle Sharing Schemes (BSS) was built and analyzed. A more detailed examination of bike sharing is included in the sidebar.

Figure 4 shows, as of 2014, the number of shared bikes within countries that have adopted BSS within some of their urban hubs, as well as shared bikes per capita (inset). It is evident that China has made the greatest investment in this new mode of sharing with many OECD countries following suit. It is important to note the number of BSS within each country as well (shown as numbers below the bars). This reflects the extent to which multiple cities have adopted systems. There is rapid growth both in the number of systems and system size, which is not reflected in this static snapshot.

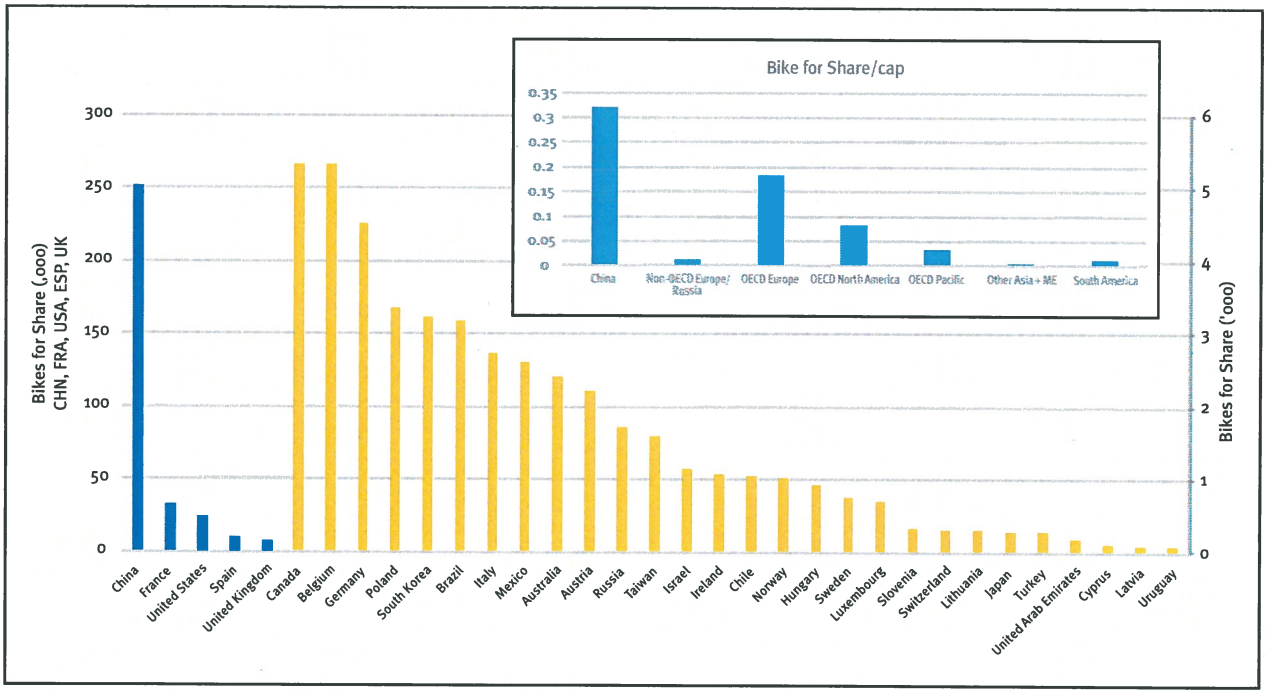


Figure 4. Bike sharing by world region, totals and (inset) per 1,000 residents.
Note: For totals, the blue bars relate to the left axis, and the yellow bars to the right axis.

Bike Share

Bike sharing is rapidly growing as a means of urban transportation, increasing from only fifteen thousand bikes in 2007 to more than one million bikes in 2015. These systems eliminate the need to purchase, store, or maintain a bicycle, creating easy access to bicycle transportation. Bike sharing also allows for trips to be made at either end of public transportation, without the need to store or transport a personal bicycle. This greatly expands the number of origins and destinations that can be reached quickly from transit stations.

Several types of bike share systems exist. A few systems are manually operated, with each station staffed by an attendant who controls bicycle rentals and returns. Most current systems are automated using "smart dock" technology. In these systems, bicycle rentals and returns are handled automatically through electronic locking mechanisms at docks in each station that secure the bicycles when they are not in use. The docks and stations are connected to user accounts through Internet connections. In some newer "smart bike" systems, the locking mechanisms and Internet connections are attached to the bicycles themselves, which may provide greater flexibility. Bike share bicycles are typically heavy-duty, weather-resistant vehicles that are quickly adjustable for use by a wide range of body shapes and sizes.

Some cities are experimenting with new technologies for bike share systems to serve a greater variety of trips. Tricycles have been deployed for less physically active users, shared cargo bikes help move heavy things, and shared e-bikes make cycling easier in hilly cities and for less physically able people. The rapid growth of bike share systems and the surge in innovation indicates that bike sharing will likely be an increasingly important piece of the urban transportation system.

In this study we have not attempted to estimate the marginal contribution of bike sharing to overall biking or impacts such as CO_2 reduction. It would take a very large expansion of bike sharing systems around the world to have a significant effect compared to all the private bike travel projected in our HSC. However, given that bike share systems have catalyzed dramatic increases in private bike use in many cities, especially when paired with bicycle infrastructure and other policies that support cycling, these systems can have strong indirect impacts on total cycling levels and benefits.

Given the benefits, popularity, and relatively low cost of bike share systems, governments around the world have provided subsidies to support their creation, operation, and expansion.

3. Cycling BAU Scenario

The following section outlines a cycling BAU scenario, which describes the likely future if the current trajectories for transportation and development policies continue without strong deviations due to policy or other discontinuities. The section is followed by an HSC scenario that describes a future where policies are adopted to favor sustainable transportation, with a particular focus on bicycle use.

Projecting current cycling trends into the future for the BAU scenario is difficult given the lack of strong time-series data on key cycling indicators, such as the number of trips or kilometers per capita. Sales of bicycles are generally not useful indicators of cycling, as bicycle ownership is poorly correlated with bicycle use, particularly for "utility" trips. Instead, as shown in Figure 1 and discussed above, we used the mode share data to create very approximate trends by region, particularly for determining whether cycling per capita appears to be rising or falling beyond 2015. We assumed that approximate mode share trends continue to 2030, then slow to 2050. For each region, the average cycling mode share is shown over five-year periods, 2000 through 2015, along with 1997 to 2000. The number of cities for which there is data, included in the average, is shown above each bar.

Though many years in most regions have low or no records, some rough trends emerge, such as a slight increase in OECD Europe cycling mode shares and perhaps in the United States as well. In non-OECD regions, both data and anecdotes show declining cycling mode shares but again the low data coverage for many regions and years makes this difficult to verify broadly.[13] Some regions, such as OECD Europe, have robust records showing a clear, if only slight, increase in mode shares; others, such as Japan, show no clear trend.3 The United States appears to show a general upward trend.

Based on our interpretation of these rough trends and anecdotes, we set the future trends very simply: in OECD we have increased mode share by 0.2 percentage points per year (one percentage point every five years), though also subject to a maximum 2 percent change versus the previous year to avoid excessive changes in countries with low mode shares; in non-OECD we set a declining rate of the same magnitude. The results are shown in Figure 5. Overall these are quite conservative figures—not major changes from today's mode shares. The 2030 mode shares tend to be less than 10 percent above (or below) today's levels. This reflects a future of slow, steady trends, not radical departures that would likely need to be driven by new policies—these are handled in the HS scenario.

When converted to PKT (using data on trips and trip length), the projection in Figure 5 emerges. The results show slow upward trends in cycling in OECD countries, and some fairly strong downward trends in cycling in the developing world. This represents the BAU future upon which an HSC scenario must be overlaid.

BAU Projections for E-biking

We developed future e-biking levels and mode shares based primarily on the recent sales data shown in the previous section. Given the higher cost of e-bikes and their more limited appeal for recreational use, the sales data are assumed to have a strong correlation with use as transportation, although some recreational and tourism use clearly occurs in Europe and the United States. E-bike sales data is projected to 2030 and 2050 in Figure 6. Sales increased from 2015 to 2030 by the same percentage increase seen in recent history, with a maximum increase of 5 percent yearly. From 2030 to 2050 a sales growth cap was established at 2.5 percent annually, assuming that most of those interested in e-biking are already in possession of e-bikes, and e-bikes sales are primarily for the replacement of existing e-bikes. The large majority of global e-bike sales occur in Asia Pacific, primarily in China.11 This reflects ongoing bans on ICE two-wheelers within Chinese cities, pushing the population to use e-bikes. The transition has been expedited by low operations and maintenance (O&M) costs, existing cycling infrastructure, and a culture of widespread acceptance of motorized two-wheelers.[14] Western Europe dominates the rest of e-bike sales, which is parallel to its historic adoption of

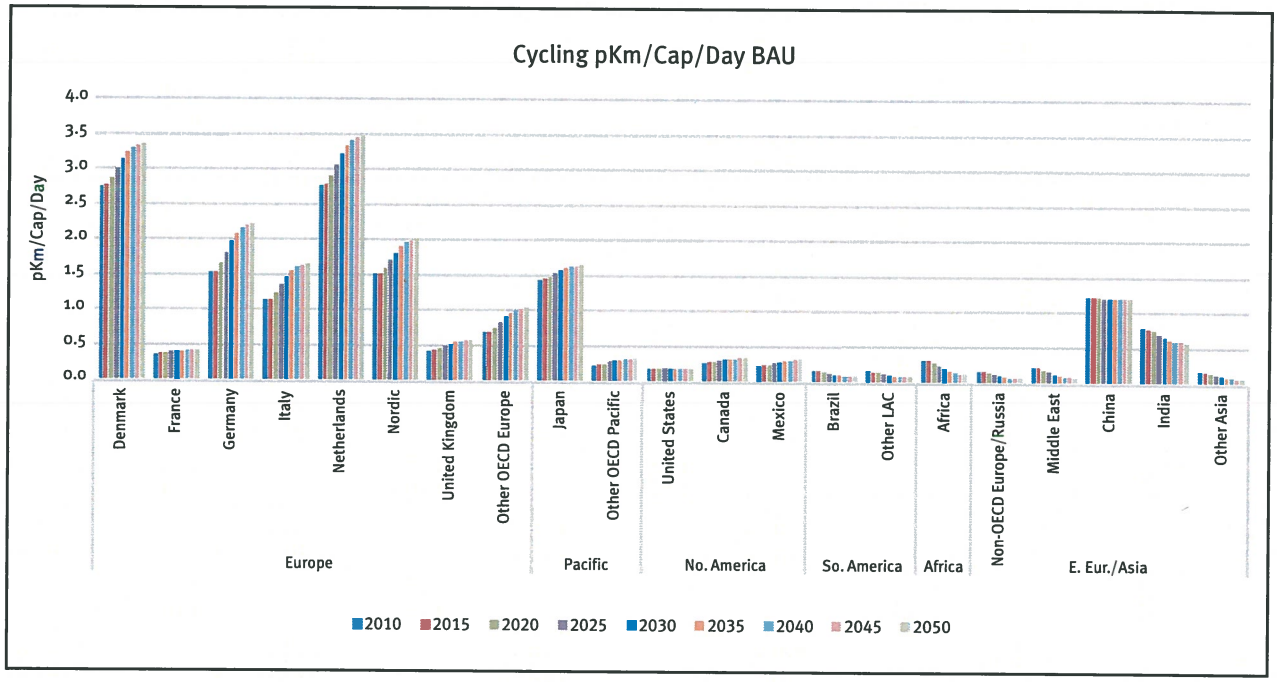


Figure 5. BAU projections of cycling by region, 2015 to 2050.

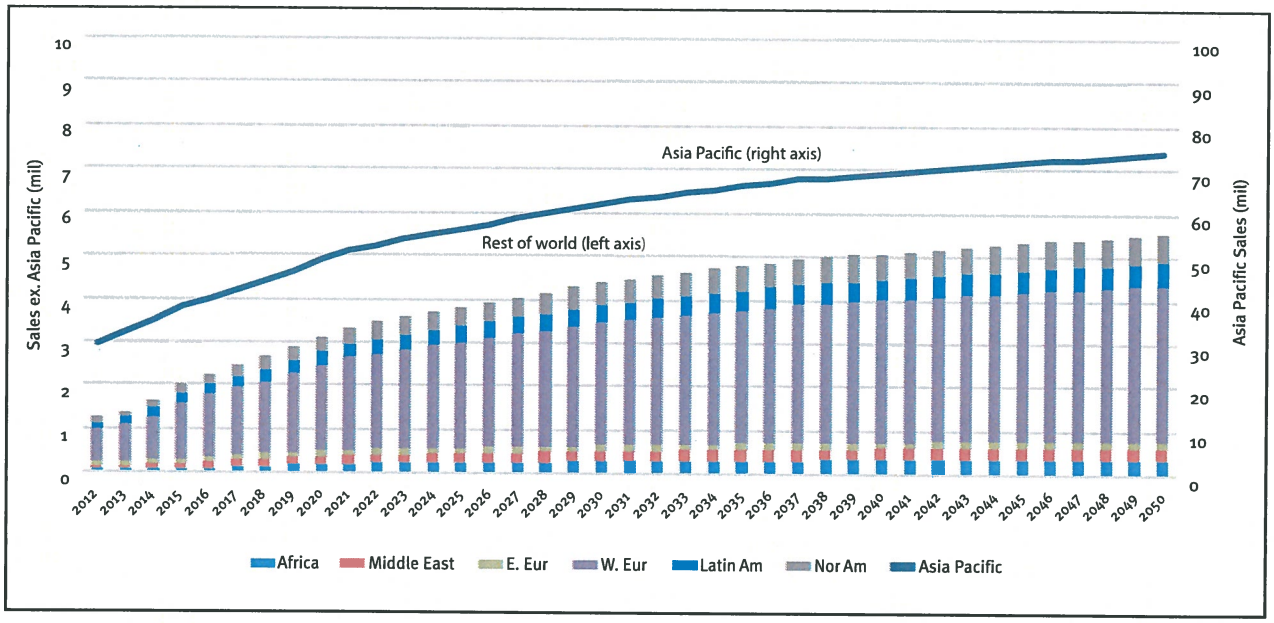


Figure 6. E-bike sales, BAU projection, 2015–2050.

traditional bicycles. North America, Africa, and Latin America are all projected to have a slow but consistent growth in e-bike sales through 2050. Eastern Europe, Russia, and the Middle East are projected to experience a much slower rate of sales going forward. Few new policies emerge to promote e-biking, provide bicycle infrastructure, or otherwise incentivize higher uptake rates than shown here.

The e-bike sales projections, coupled with an assumed steady use of e-bikes at around 6 kilometers per trip and one trip per day per e-bike, or 6 kilometers per day per e-bike, results in the average e-bike PKT per day across the entire population, shown in Figure 7. Some countries are expected to be stuck at very low levels of e-biking, given the very low levels today, with no expectation that this will change without strong new policy drivers. A good example is India, where e-bikes are expected to be uncompetitive with gasoline scooters unless policies are enacted to change this.

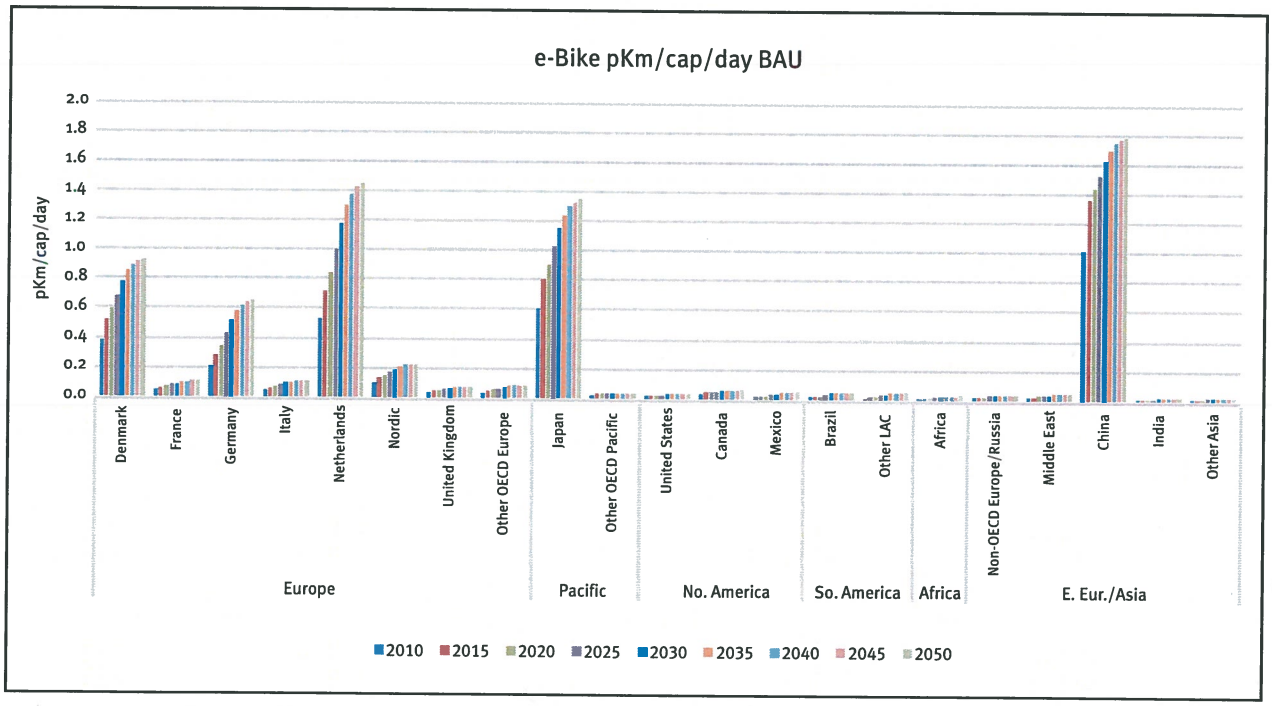


Figure 7. E-bike passenger travel per day, BAU, 2015–2050.

BAU Policy Narrative

The BAU scenario reflects a continuation of existing cycling policies as well as other transportation and urban development policies. In the OECD, more policies supporting bicycle use will continue to be adopted. This slowly translates to additional bicycle use as streets become increasingly safer and more comfortable and convenient for cycling.[1] Generally the countries with the best existing bicycle infrastructure continue to show growth, while areas with low bicycle use, infrastructure, and awareness (and often high car dependency) show slower growth in cycling levels. Wealthy countries have seen car ownership levels, as a percentage of the population, plateau. OECD car ownership is not expected to grow significantly per capita in the future, as cities slowly embrace a broad variety of policies encouraging sustainable transportation and development.[8] Further, urban populations in OECD countries are generally growing slowly, compared to cities in non-OECD countries, and they spend less on new road construction and more on road maintenance and retrofitting for more sustainable transportation. Smaller cities in OECD countries may continue to lose population, straining the ability of governments to provide services to increasingly low-density population. To address this situation, some governments will push for cities to shrink in size and to use resources even more efficiently. This may result in some increase in bicycle use as trip distances decline and government support for expensive automobile infrastructure declines.

In non-OECD countries, many cities are growing in a rapid and often loosely planned manner, with most growth occurring on the urban periphery in increasingly low densities. As more people are able to afford cars and motorized two-wheelers, they will buy them—possibly in great numbers. In the BAU, cities continue to pave and widen streets to accommodate the additional motor vehicle traffic, but with little or no provision for cycling. With growing motor vehicle congestion and higher speeds, the environment for cycling in cities becomes increasingly hostile, causing more people to shift from cycling to other modes. With declining densities, other sustainable transportation modes, such as walking and cycling, will also decline in most cities. In the largest cities, some investment will continue to be made in rapid transit, but most cities become increasingly dependent on private motor vehicles for personal transportation.

4. High Shift Cycling Scenario

In the HSC scenario the goal is to examine the upper limits of a plausible future of cycling—that is, to reach levels of cycling and e-bike riding that are well above today's or the projected increase in the cycling BAU scenario. We have developed 2030 and 2050 targets for the HSC scenario based on three general considerations that can be supported by the evidence of shifts to cycling already achieved in high-cycle-use cities:

1. that the average city of the future can reach or at least approach the current cycling levels of the better-performing cities within its own country or region

2. that a certain percentage of trips are "cyclable," based on trip distance

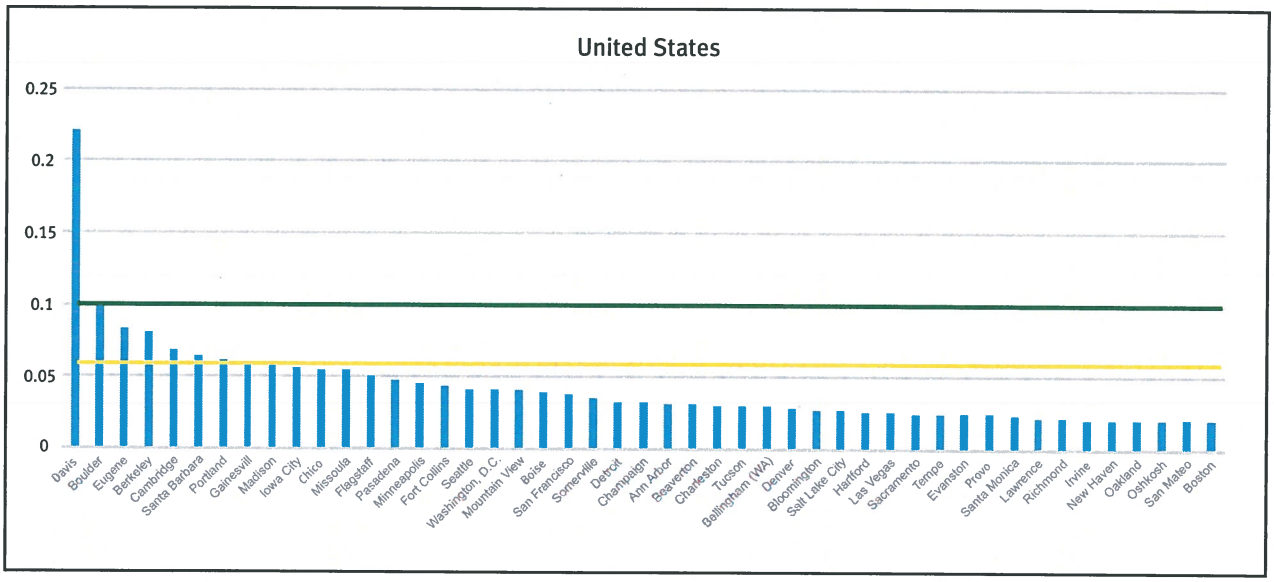
3. that future increases in cycling/e-biking will not exceed a maximum rate of change (increase) that seems plausible in a five-year period, based on past increases.

The HSC is dependent on a major shift in behaviors that has been achieved in a number of cities with strong policy support, including various incentives. It also will be greatly aided by better infrastructure (itself a function of policy) and aspects like reductions in the price of e-bikes, which are currently much more expensive than gasoline two-wheelers in many countries. These and other policy aspects are described in Section 5; here we lay out the actual HSC scenario, and elaborate the potential impacts of this scenario on modal shift, travel patterns, energy use, CO_2 emissions, and costs.

The mode share targets in the HSC have been developed with the above three factors in mind, though the cities in each region with the highest levels of cycling have provided the most important foundation for establishing our targets, along with cross-regional comparisons. Figure 8 shows four specific countries as examples, indicating the range of cycling mode share in the cities for which data is available. In general, HSC targets for cycling in 2030 have been set in the vicinity of the current top five or ten cities within a country or region, which puts the targeted cycling levels above those in the vast majority of cities. Adding in a target for e-cycling, the combined target (shown in green) is near or above the current best-known city in the region. It is important to keep in mind that data for many cities is missing, and there could be other cities with relatively high cycling mode share, although it seems likely that the vast majority of missing cities have a mode share below those with data, since those cities reporting data are likely ones that have initiatives under way.

For most countries and regions, this combined target is very ambitious, particularly with the expectation that it will be achieved within fifteen years. Figure 9 shows the five-year changes for cycling to achieve the 2030 targets, and that are included in our modal shift analysis. We have fit a logistic growth curve to represent the increase in cycling and e-biking over time, which allows for a "slow start" in the 2015–2020 time frame, but then requires dramatic shifts over the 2020–2030 period. Is this even possible? The "policy narrative" section below delves into this, but a couple of examples in the previous section (Denmark, for example) suggest that a country (and cities) committed to major shifts can achieve ten percentage point or higher mode share increases in a ten-year period.

Regarding the number of trips that are "cyclable," the data on trip distance, though scant, suggests that a very high share of one-way urban trips traverse distances that are easily covered by cycling or e-biking, at least in principal.[6,15] Of course this depends on factors such as weather and terrain—which are very city specific—and some demographic groups are more limited in their trip types and distances than others. But given typical cycling trip distances of 3–5 kilometers and e-biking capable of distances of 10 kilometers without much trouble (an e-bike going at 30 kilometers per hour can cover 10 kilometers in twenty minutes, making this an easily commutable distance), we looked at the share of trips in a number of countries that are 5 to 10 kilometers.[5] An example is shown in Figure 10—the



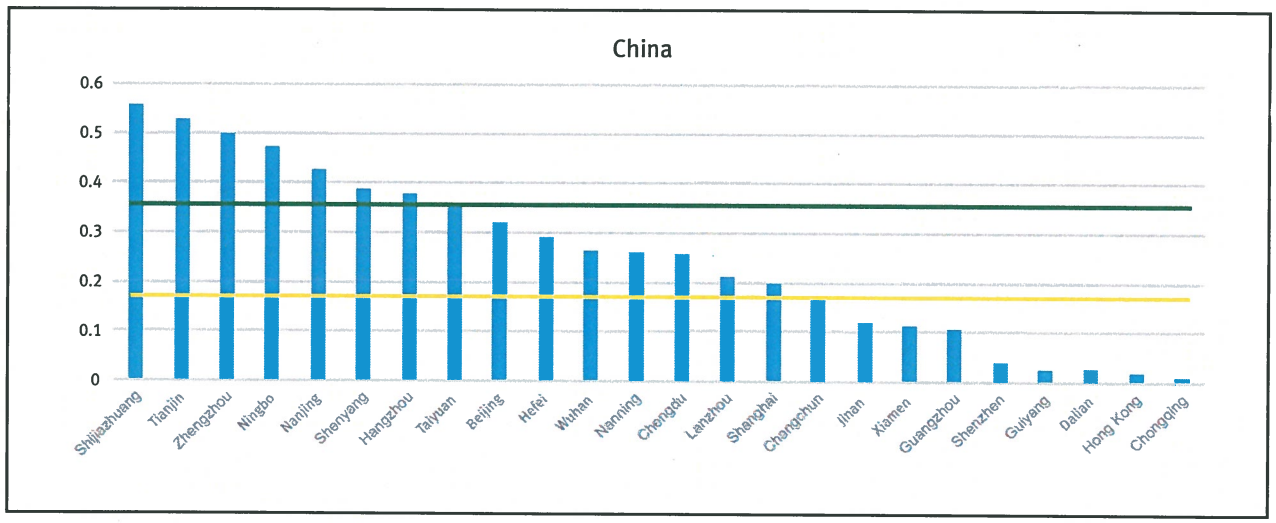
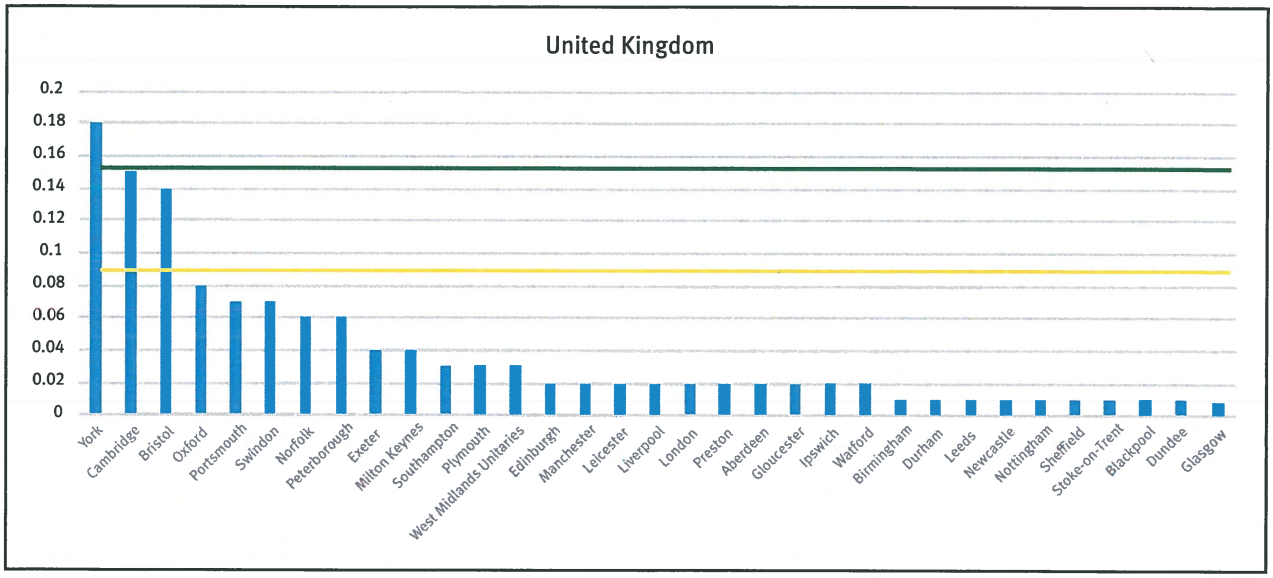


Figure 8. Cycling (yellow bars) and total of cycling plus e-biking (green bars) mode share targets for 2030 for four example countries, also showing recent mode share data for cities within those countries.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Liverpool
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Preston
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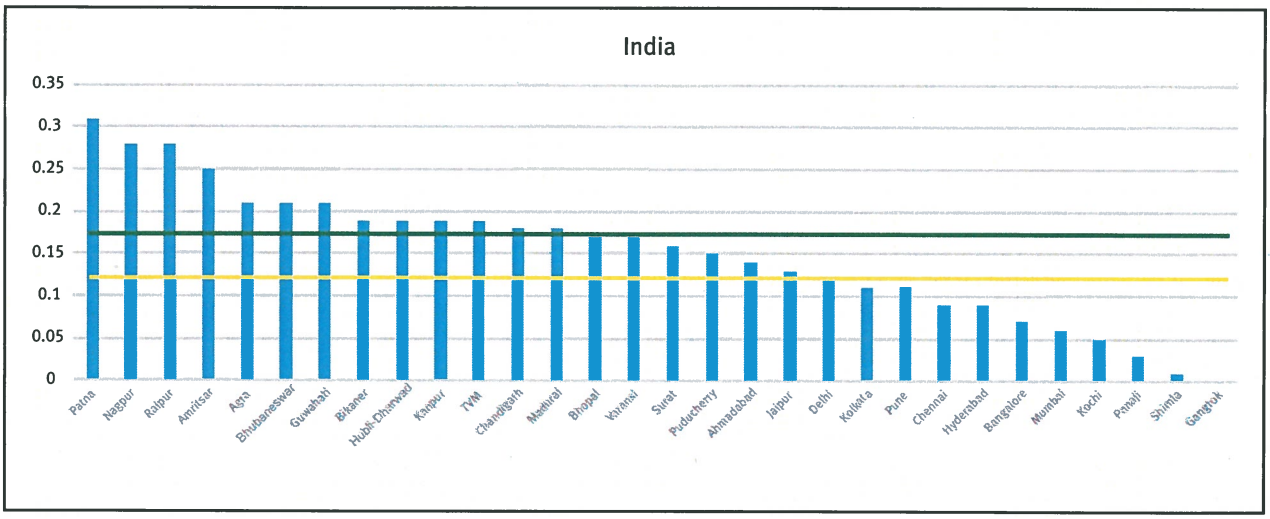
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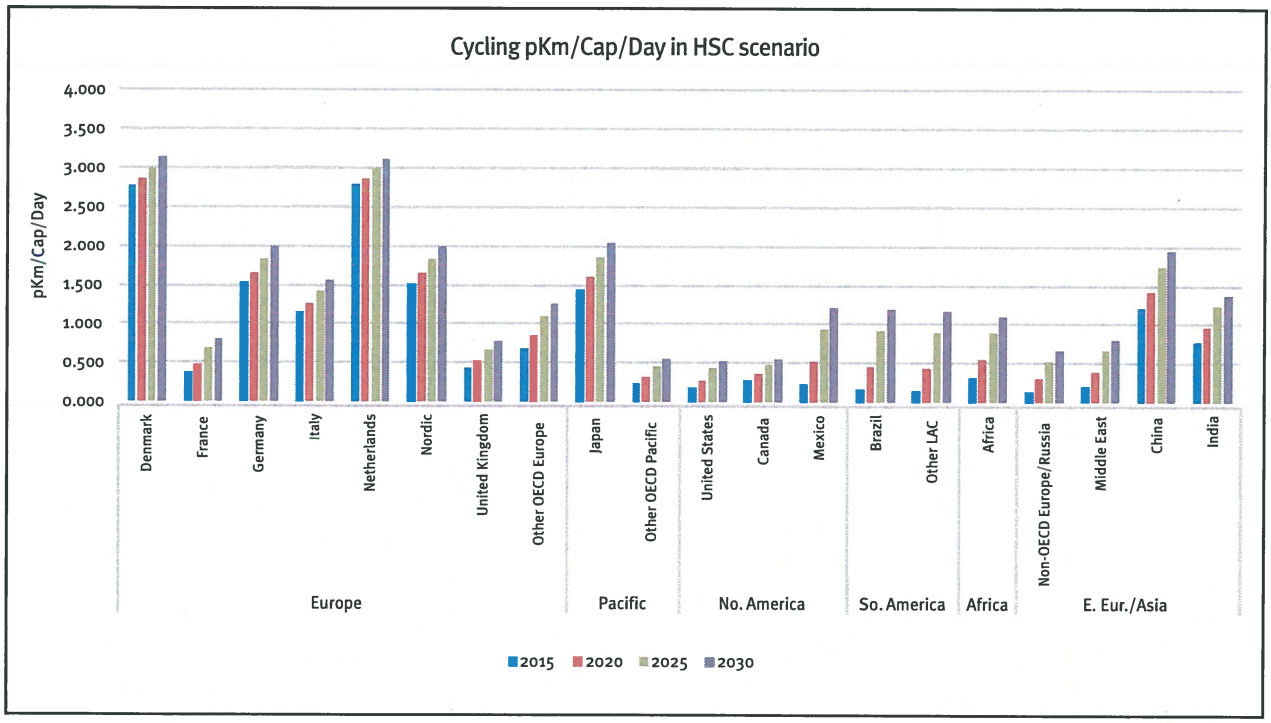


Figure 9. Increase in cycling per person per day between 2015 and 2030, HSC.

United States. This shows that even in the United States, fully half of all car trips are five miles (8 kilometers) or less, and 35 percent are less than three miles (5 kilometers). Thus while for the United States the HSC target in 2030 is set at about 10 percent for combined cycle/e-bike mode share, a much higher mode share would appear possible given trip distances. The United States has among the longest average urban trip distances in the world—thus most other countries have higher shares of trips that are less than 10 kilometers. Even in Belgium—with much higher cycling shares than the Unites States—car trips account for about 70 percent of 5 kilometer trips and 80 percent of 8 kilometer trips.[16]

Figure 11 shows the same results for only the HSC separated by region. These reflect the foregoing assumptions and considerations in developing this scenario.

Modal Shift Impacts of the High Shift Cycling Scenario

Assuming a much higher uptick of cycling and e-biking requires a second assumption—how does this change broader travel patterns? Individuals choosing to cycle typically means they are also choosing not to travel by another mode—be it walking, driving, or taking public transport. In the case of e-biking it could also mean shifting from a gasoline-powered two-wheel scooter or motorcycle. In the long run, a shift in travel modes toward more cycling has broader dynamics—supporting denser cities with transportation systems more oriented to walking, cycling, and public transport, as opposed to sprawling car-dominated cities.[a] In addition, over a thirty- to forty-year time frame, this development can relate to an uptick in cycling rather than an uptick in driving (or even a modest shift from the latter to the former) by people who do not yet own a car—the vast majority of people in the developing world. Thus for a 2030 modal shift estimate, this is really an alternative development estimate—more people take up cycling and e-biking over time, and the demand for car ownership and car travel drops somewhat.

There are many ways that such scenarios could play out. For example, bicycles could substitute for some mass transport trips; on the other hand they could be part of a much

[a] World Economic Outlook Database, October 2014, International Monetary Fund. Database updated on 7 October 2014. Accessed on 27 January 2015.

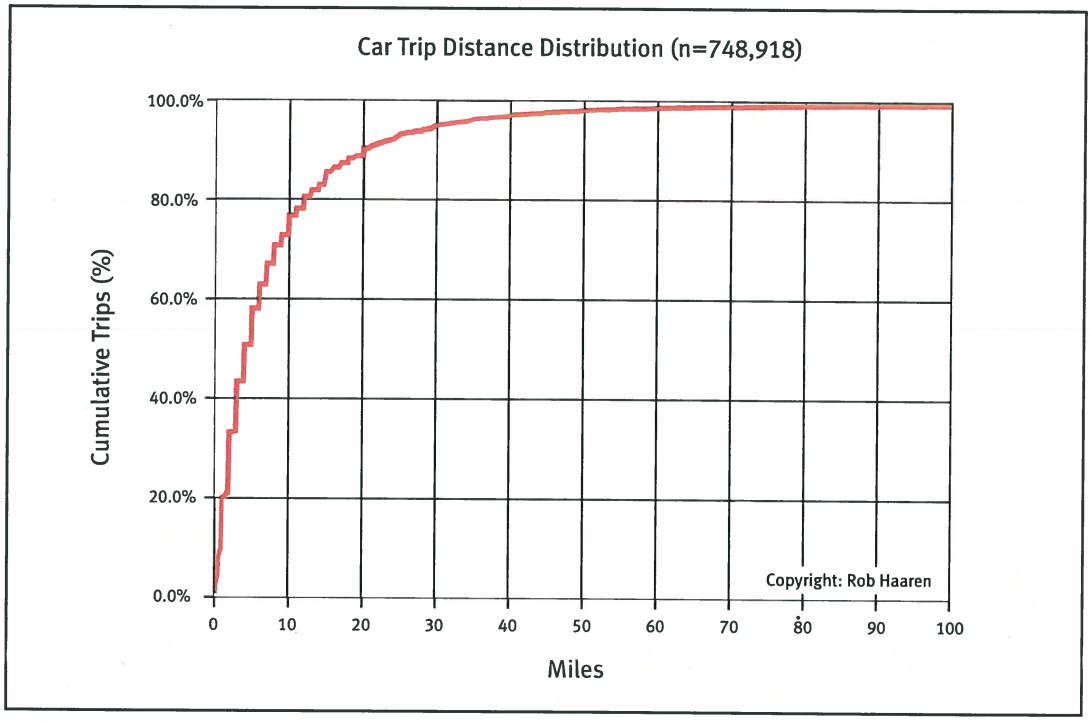


Figure 10. Percentage of car trip distances in the United States.17

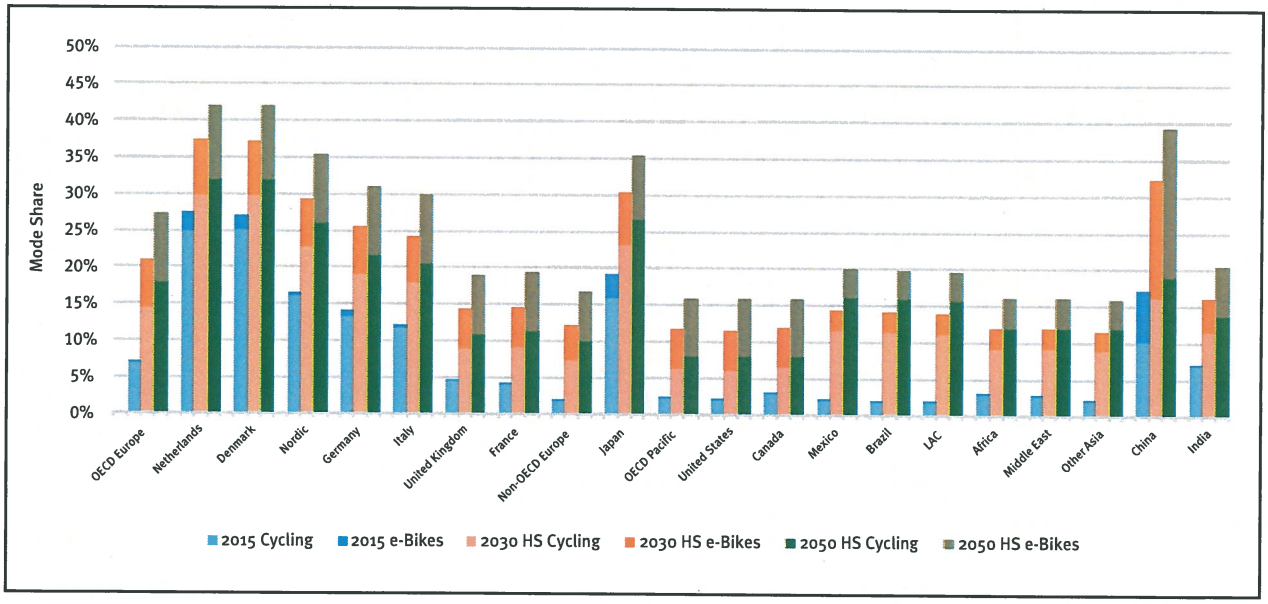


Figure 11. Mode shares to 2050, High Shift Cycling Scenario

more transit-oriented system where many trips involve both cycles and public transport, with cycles providing the "first and last mile" linkage and bus or rail providing the "core" part of the trip. The specific assumptions can have major effects on the resulting impacts on overall mode shares, kilometers of passenger travel by mode, transport system energy use, CO_2 emissions, and a range of cost indicators. The HSC scenario represents one plausible way in which these interactions could occur, based on the experience of cities that have achieved high rates of cycling. The analysis provides estimates of how a high shift toward cycling could translate into changes in key indicators of interest.

The cycling modal shift assumptions are as follows:

1. Starting from the HS scenario from our 2014 Global High Shift study, for each country/region we removed the (usually small) increase in cycling/e-biking that was projected to 2050, leaving only the effects of (fairly large) increases in bus and rail transit systems and their mode shift effects.

2. We then reintroduced our new HSC projections for cycling/e-bike travel.

3. We then reduced future travel from three modes: cars, motorized (typically gasoline) two-wheelers (M2W), and regular large and small buses to capture our mode shift to cycling. We did not lower the levels of travel on "rapid transit" modes (bus rapid transit and all urban rail modes). We assumed that these would remain at their high levels as part of our bicycle-enhanced future scenario.

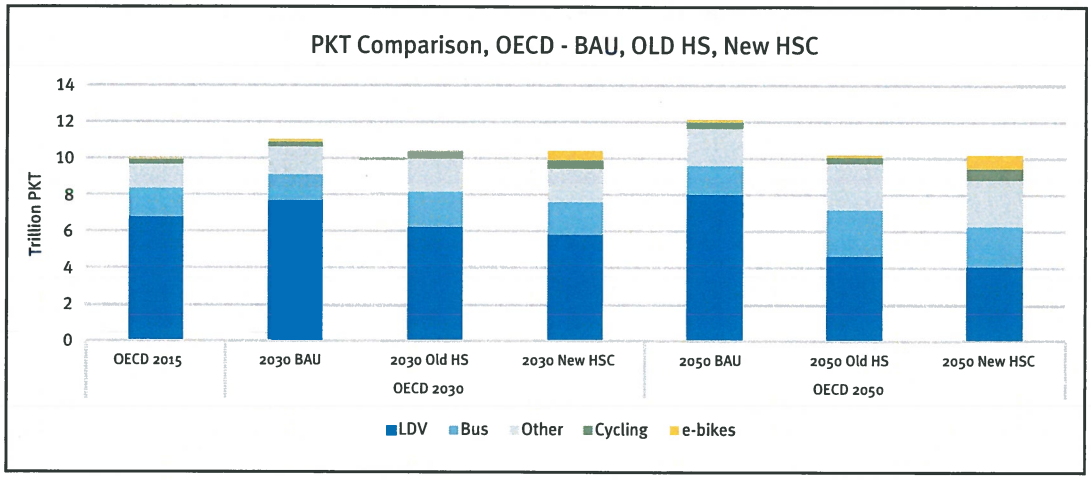
4. We lowered travel by car/M2W/bus to offset the rise in cycling/e-bike passenger kilometers in a given year. For example, an increase of 100 kilometers per person per year of cycling in 2030 results in a combined reduction of 100 kilometers in car/M2W/bus travel.

5. The relative reduction among these three modes is determined by their initial shares in the given year. For example, if there is twice as much car PKT as bus PKT in 2030, car PKT is reduced by two times the kilometers than bus PKT (and the opposite if bus PKT starts out twice the level of car PKT). This allows the dominant modes in each region to provide the biggest share of travelers shifting to bikes. This is typically cars, but in some regions (for example, Japan and Africa), in 2030 buses provide more PKT than cars, so there is a bigger reduction as people shift to bicycles/e-bikes.

The results of this for 2030 and 2050, on an OECD/Non-OECD basis, are shown in Figure 12. This shows the BAU case, last year's HS case with the BAU levels of cycling/e-biking, and the new HSC case with much greater levels of cycling and lower levels of travel by other modes.

The changes between these scenarios are more clearly explained in Figure 14, which shows the 2030 and 2050 differences between last year's HS versus BAU and the new HSC changes versus BAU, for OECD and non-OECD. This clearly shows that the cycling and e-bike levels do not change for last year's HS (since they were reset to BAU levels) whereas they change significantly for the HSC scenario. The impact of modal shift from these changes in cyling and e-biking is substantial: for example, in 2030 the drop in OECD driving was 18 percent in last year's HS, but in the HSC driving decreases by 24 percent over BAU. In non-OECD, driving decreased by 21 percent over BAU in last year's HS scenario, but in the HSC driving decreases by 29 percent over BAU.

Figure 13 also shows that there is a reduction in the increase of bus travel in the HSC scenario versus last year's HS, since some of the previous increase in bus travel is instead shifted over to bicycles/e-bikes.



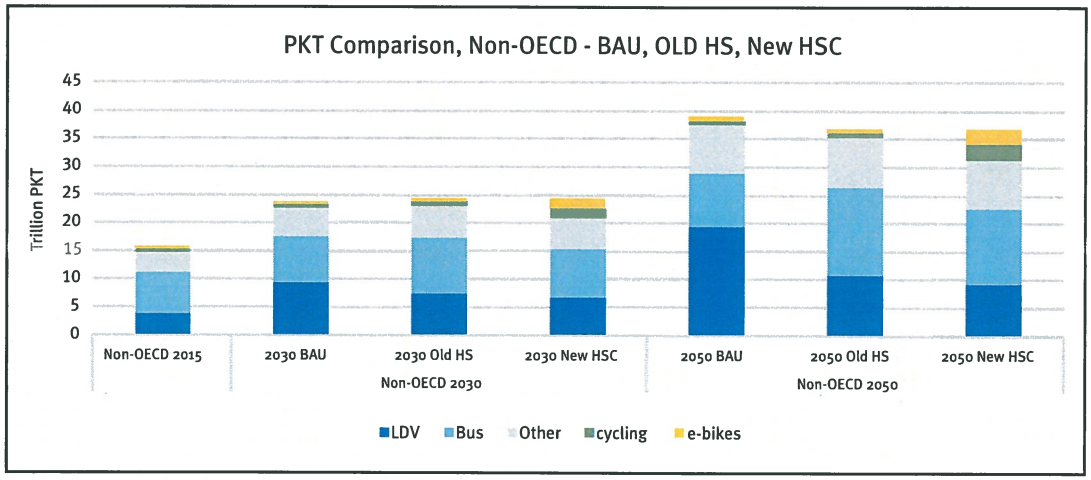
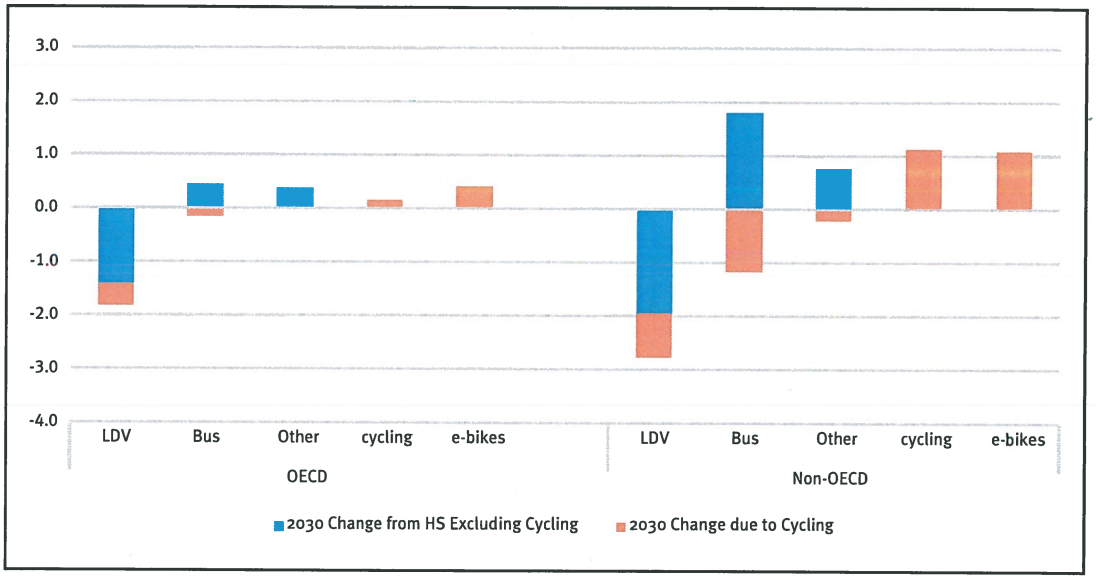


Figure 12. PKT Comparison between BAU, 2014 HS and Current HSC, for OECD and Non-OECD.



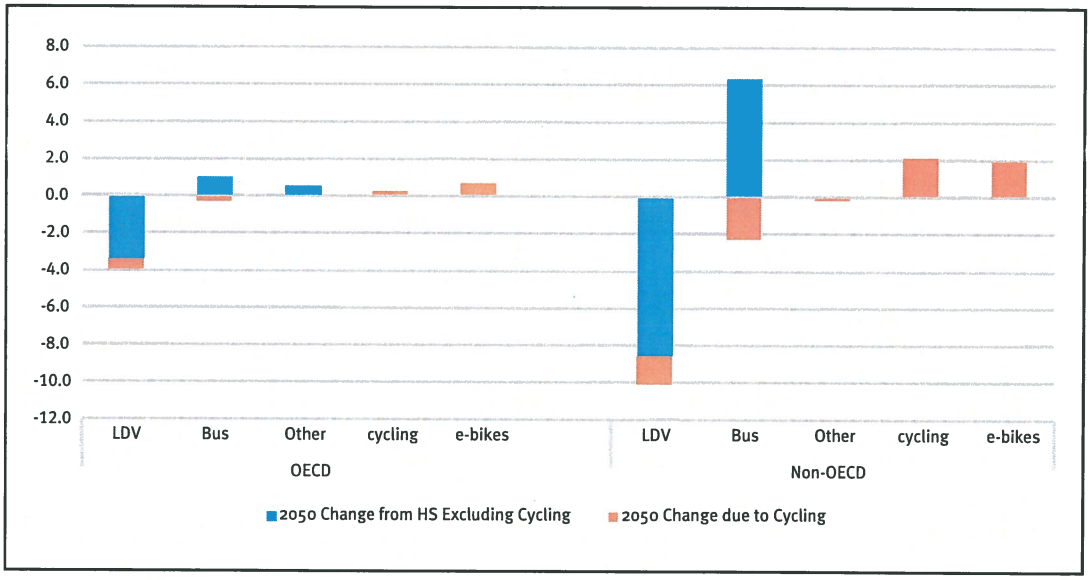


Figure 13a. Change in PKT relative to BAU for previous HS and new HSC scenarios, 2030.
Figure 13b. Change in PKT relative to BAU for previous HS and new HSC scenarios, 2050.

Note: For buses, the reduction in the HSC scenario is relative to the increase that occurred in the old HS scenario, so the net change in bus travel is still positive.

Impacts on Energy Use and CO_2 Emissions

The projected increase in cycling/e-biking and the corresponding reductions in future car, bus, and M2W travel in the HSC scenario are expected to significantly reduce both energy use and CO_2 emissions.9 However, one complicating factor is that e-bikes use electricity, and given the very large increase in the use of e-bikes in the HSC scenario and subsequent increase in electricity use, this tempers reductions in energy use by modes powered by gasoline and diesel.

Another factor is the number of people per vehicle and per vehicle kilometer of movement. It may take two e-bikes to replace a car that typically has two riders (though most regions average fewer than two people per car trip); it may take nearly forty bicycles or e-bikes to replace a half-full city bus that can hold eighty people. Our assumptions on vehicle efficiency are shown in Figure 14. The graph shows that e-bikes are indeed more energy efficient per passenger-kilometer, on average, than even rail transit, though in some situations (e.g., rush hours with very full trains or buses), these modes may do better than e-bikes. Rapid transit systems—for example, metro and BRT—also have the potential to move many more people at higher speeds in limited street space than e-bikes. Further, over time, cars and other personal light-duty vehicles are projected to get more efficient, reducing but far from eliminating the energy efficiency advantage of e-bikes. Overall there is a need for a mix of modes that encourages compact land use and a variety of travel options for different types of trips.

Finally, one other factor deserves mentioning: energy use by regular bicycles. Cyclists require energy to pedal bikes, which comes in the form of the food the riders consume. This may be significant, but on the other hand there is considerable energy expended for walking trips and even to take bus or rail transit, and sometimes a long walk from a car to a final destination such as an office within a large building. Further, the energy used in biking may in many cases help improve a person's overall fitness and reduce obesity, and may not require much or any additional food intake to provide the energy.[a] In any case, attempting to track the details of human-expended energy for cycling or other travel is outside the scope of this study and a potential research project in its own right. Nor does this study account for embedded energy and CO_2 associated with vehicle manufacture or infrastructure provision.

The change in energy use in the HSC scenario versus the previous HS scenario is shown in Figure 15, for OECD and non-OECD. The reduction in fuel use from non-e-bike modes is on the order of eight to ten times greater than the increase in energy use by e-bikes;

CO_2 emissions are a direct function of fuel use, and in the case of electricity the emissions are associated with fuel used in the generation of electricity. The results report the "well-to-wheels" emissions of the gasoline, diesel, and electricity used in the BAU and HSC scenarios. The IEA's Energy Technology Perspectives (ETP) electricity generation/CO_2 factors are used, which vary both by region and over time. The

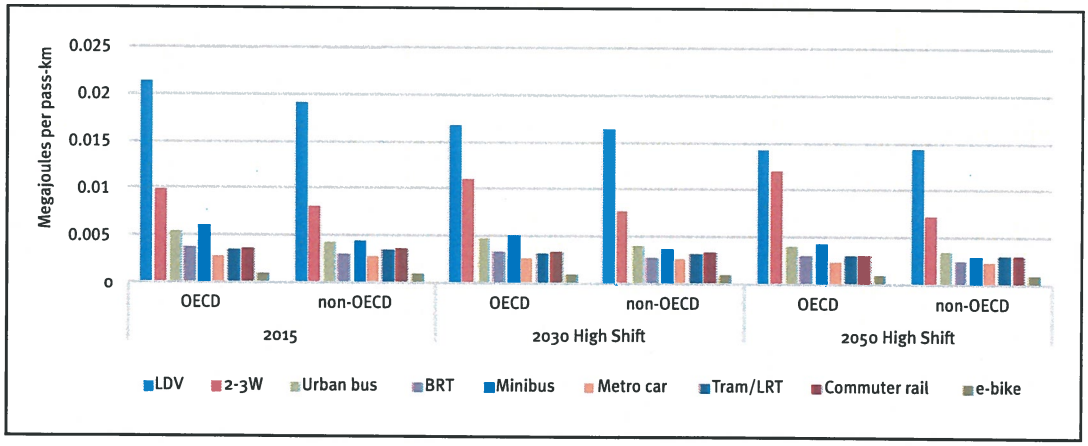


Figure 14. Energy intensity by mode, year, and region.

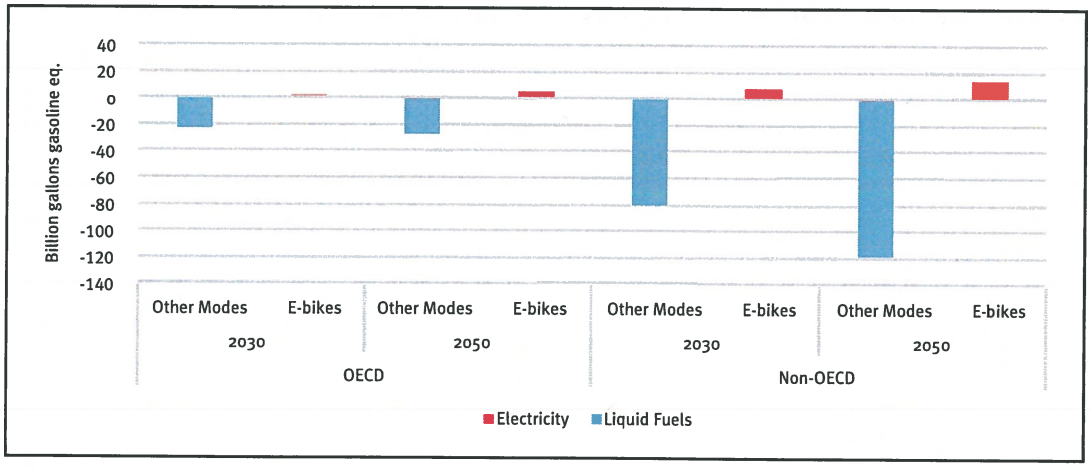


Figure 15. Change in energy use, current HSC versus old HS.

4°C Scenario (4DS), developed as part of IEA's ETP [b], is used for the electricity CO_2 projections in both the BAU and HSC scenarios, meaning that in most countries there is some de-carbonization of electricity over time, though not the very deep de-carbonization that occurs in the IEA's 2 Degree Scenario (2DS). Thus if this mode shift scenario were placed in the context with a broad 2DS, e-bikes and other electric vehicles would be almost completely de-carbonized by 2050 (and many light duty vehicles [LDVs] would shift to electric and also be de-carbonized).

As shown in Figure 16, the reduction in CO_2 emissions is similar to the reduction in energy use when comparing last year's HS scenario to the HSC scenario. The bicycle/e-bike increases and the modal shift generate about a 7 percent average reduction in CO_2 emissions over the HS scenario in 2030, rising to 11 percent by 2050. Compared to the BAU, the HSC scenario (including all elements of the original HS scenario along with the high cycling elements) cuts urban passenger transport CO_2 by 24 percent in 2030 and 47 percent in 2050—that is, nearly a 50 percent reduction in global urban passenger transport CO_2 from modal shift. This assumes that fuel economy standard requirements now slated for implementation under adopted rules go forward but are not modified further. If the world also adopts a global road map to a doubling of motor fleet fuel economy as proposed by the Global Fuel Economy Initiative, the impact of that initiative on CO_2

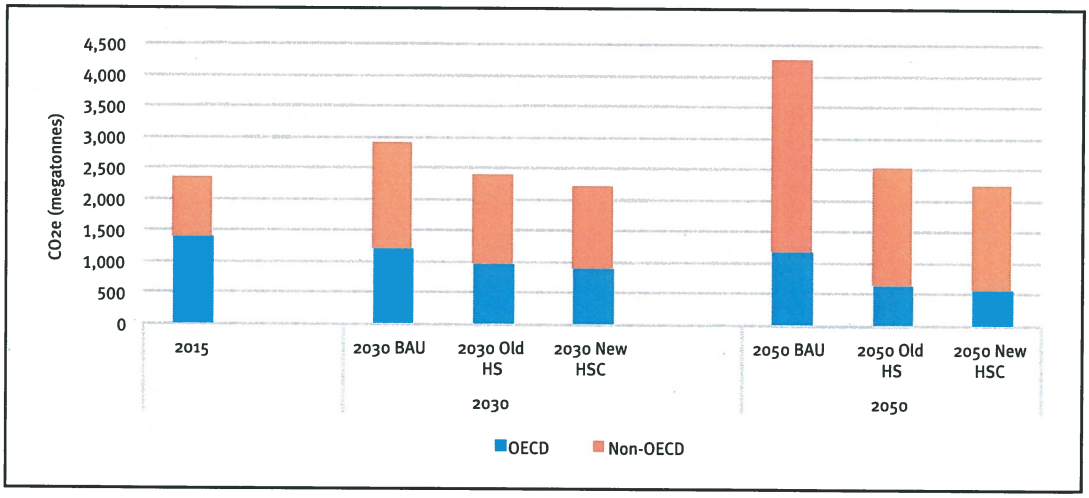


Figure 16. CO_2 emissions by scenario, year, and region.

[b] The analysis of well-to-wheel impacts was performed using IEA's Mobility Model (MoMo), as proprietary, spreadsheet-based energy and CO_2 emissions model, that uses energy data from the 4DS and 2DS scenarios to project the impact of changes to travel, energy, and CO_2-related inputs..

emissions would overlap with the impact of the HSC scenario, making the marginal impact of each lower.

Costs and Savings Associated with the High Shift Cycling Scenario

As in last year's high shift analysis, four basic types of costs are tracked for the current scenario: the purchase cost of vehicles (of all types); operation and maintenance costs for these vehicles and for systems such as metros and infrastructure such as roads and tracks; the initial construction costs of infrastructure associated with roads, parking, cycling, and transit systems; and the cost of energy used by vehicles in operation.

Cost Assumptions

We used the same estimates of infrastructure and other costs per unit as in last year's report, except that we updated some cost numbers for bicycles and e-bikes. For the sales price of bicycles and e-bikes, we used recent Web searches of average prices in different parts of the world to develop very rough averages, and projected how those averages might change in the future. As shown in Figure 17, the average cost of bicycles and e-bikes is much higher in OECD countries than in China, or anywhere that has access to Chinese e-bikes. We assume that as lithium-ion battery costs decline so will the price of e-bikes that use them, and eventually that e-bikes in the developing world can switch over to lithium-ion batteries at minimal price impact.

For the operations and maintenance costs of cycles and e-bikes, we assumed an annual maintenance cost per unit for bicycles of US$30 in OECD countries and US$15 in non-OECD; for e-bikes we assumed much higher costs of US$100 in OECD and US$50 in non-OECD, mostly related to the maintenance and possible replacement cost of batteries.

Finally, for the infrastructure costs related to cycling we assumed that cities would spend US$100,000 per kilometer of new cycle routes in OECD and half this cost in non-OECD countries. This covers a wide range of situations from construction of new dedicated (or segregated) bike routes to re-striping of existing roads to provide bike lanes, and including secure bike parking facilities. These costs were applied to an estimate quantity of cycle lane construction, which in turn is linked to cycling levels (and thus rises with cycling levels over time). The ratios used were based on available data regarding the extent of cycle lanes relative to the total kilometers of cycling in a range of cities (thus this includes a large amount of cycling not actually using cycle lanes). For OECD a 2015 value of 4 million (annual) cycle kilometers per kilometer of cycle lanes is assumed, with a non-OECD average of 10 million. These ratios drop over time as strong investments are made in increasing the number of lane-kilometers. In other words, it is assumed that as more cycle infrastructure is built, more cycle kilometers are made using cycle infrastructure. OECD reaches a ratio of 2.5 million by 2050, with non-OECD reaching 5 million, reflecting growth in cycle lanes from about 200,000 kilometers worldwide in 2015 to more than 2 million by 2050.

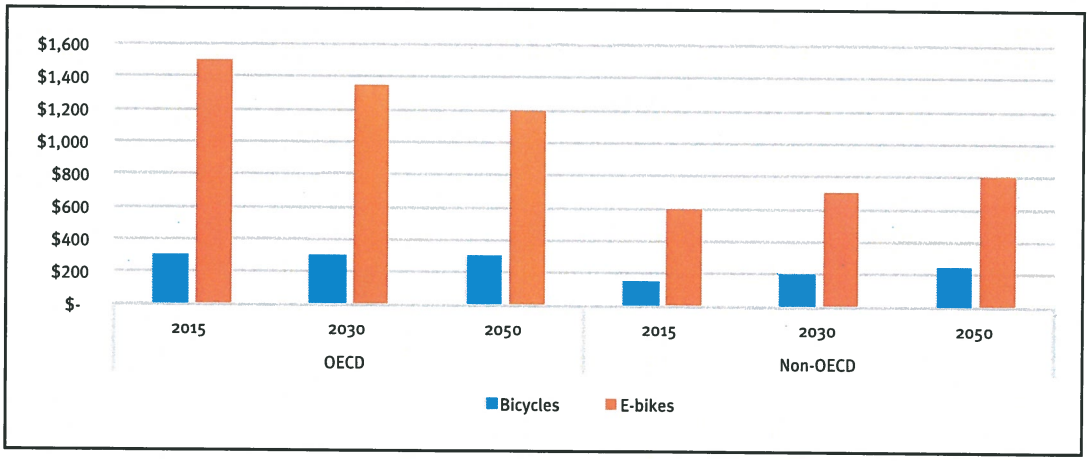


Figure 17. Bicycle and e-bike average purchase cost by region and year.

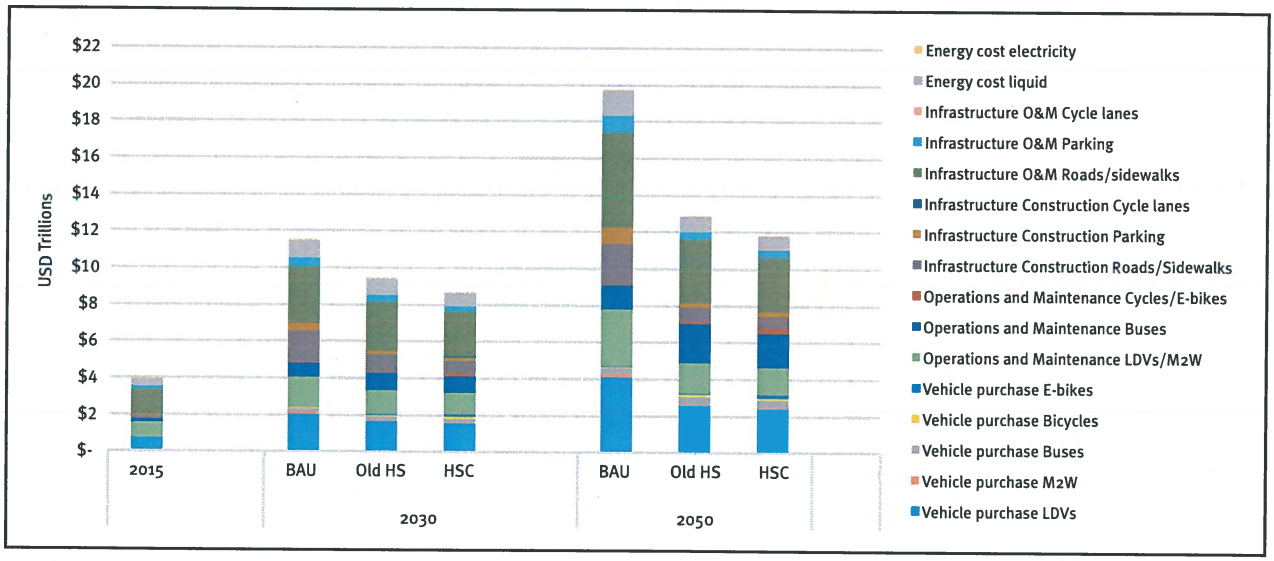


Figure 18. Total costs across all categories by scenario, 2030 and 2050.

Cost Results

The total cost across all modes in last year's HS scenario versus the current HSC scenario is shown in Figure 18. This chart isolates the effect of the increase in cycling and e-biking compared to the BAU (since these are set at BAU levels in our modified results from last year). The figure shows 2030 and 2050 results for the world; the net cost difference worldwide in 2030 is about US$700 billion—that is, this is the savings associated with the HSC scenario compared to last year's without this cycling.

The change in each cost category between the two scenarios (worldwide) is shown in Figure 20. The biggest reduction by far is a decrease in the cost of road construction. Road construction is set as a function of the size of the road network, which in turn is a function of the total vehicle kilometers of travel of all vehicle types. While it is unlikely that many roads would be removed due to lower demand, most of the roads in the developing world needed to accommodate future vehicle travel have not yet been built, and the HSC scenario creates an opportunity to avoid building some of this network. More broadly, HSC is part of a future where cities are denser, car travel much less necessary, and sprawl is greatly reduced, compared to a BAU future. Last year's HS, with a very strong increase in transit usage, picked up a considerable reduction in the need for car travel and road construction; the increased cycling in the new scenario goes even further, cutting construction costs by about US$300 billion in 2030.

The HSC also saves large amounts of money from lower vehicle purchase costs as well as vehicle, roadway, and parking O&M costs compared to last year's HS scenario. Finally, it saves close to US$200 billion in energy costs from last year's HS scenario, mainly from reductions in petroleum use. On the other hand, the HSC scenario requires a substantial increase in expenditures for bikes and e-bikes, and in bike-related maintenance and infrastructure compared to the 2014 HS scenario. But together these amount to only about US$200 billion in 2030, while the combined savings is close to US$1 trillion.

Projecting to 2050, the costs and savings from the HSC change only slowly relative to 2030 and the net savings per year do not change much—an increase to about US$1 trillion. One notable change is that the cost savings from road construction declines since even in the base scenario road construction slows down after 2030; on the other hand the savings from reduced road maintenance rises. Similarly, with a maturing bicycle/e-bike market, sales growth slows but cycling O&M costs rise with the overall stock of vehicles.

Compared to BAU, the HSC scenario has substantial reductions in societal costs, including reductions in fuel costs, O&M, and vehicle purchase costs. In the HSC scenario, while vehicle purchase costs are significantly reduced compared to BAU, there is still substantial growth in motor vehicle sales compared to 2015. However, this does not account for potential changes in vehicle utilization rates.

Bicycle and e-bike sales increase significantly in the HSC scenario, both compared to BAU, and particularly when compared to 2015 sales. The final cost results are shown in Table 2.

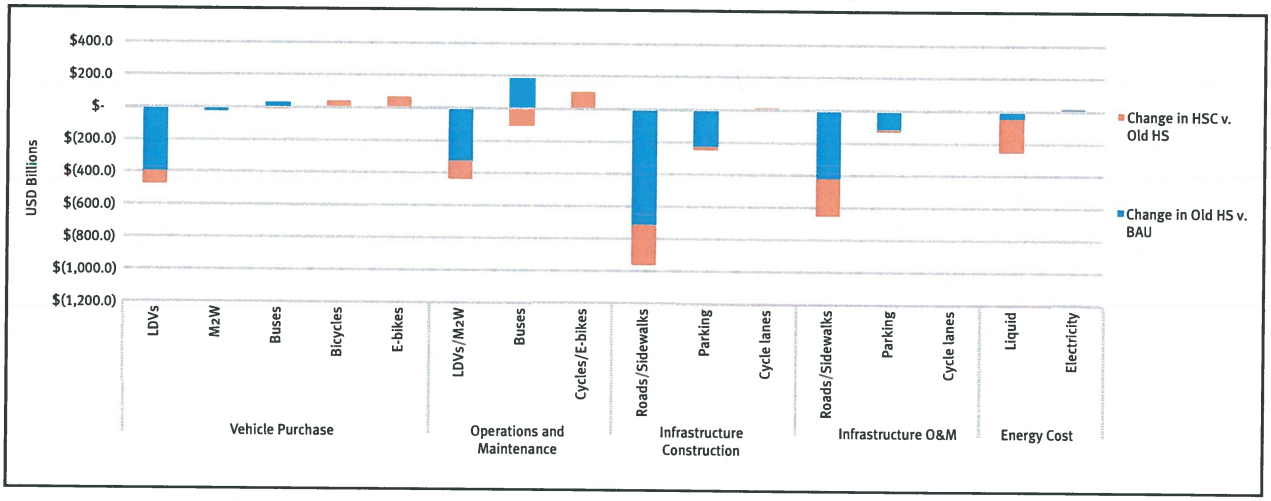


Figure 19a. change in cost ($ billion dollars) by cost category, 2030 HSC, Old HS, and BAU

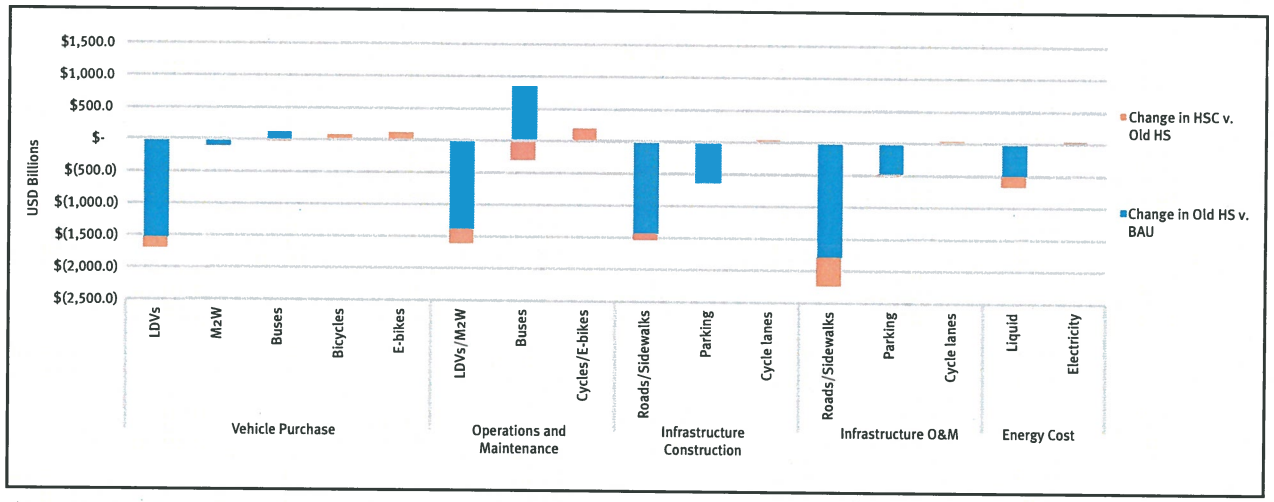


Figure 19b. change in cost ($ billion dollars) by cost category, 2050 HSC, Old HS, and BAU.

	2030	2050	Cumulative 2015-2030	Cumulative 2015-2050
Scenario Costs				
BAU	11.5	19.7	136	448
2014 HS	9.4	12.9	121	345
2015 HSC	8.6	11.8	115	320
Comparisons				
2014 HS versus BAU	(2.0)	(6.8)	(15)	(104)
2015 HSC versus BAU	(2.8)	(7.9)	(21)	(128)
2015 HSC versus 2014 HS	(0.8)	(1.1)	(6)	(24)

Table 2. Cost results by scenario and time frame, with comparisons across scenarios (USD trillions).

*Note: Differences may not appear exact, due to rounding.

5. The High Shift Scenario: A Policy Narrative

As outlined above, the HSC scenario is a highly ambitious but achievable plan for urban transportation, broadly reflecting a new paradigm of urban development in which public policies are directed toward an urban form that encourages a dramatic reduction in motor vehicle use, with much more active transport along with mass transit use. In this scenario, cars and motorized two-wheelers (such as motorcycles, mopeds, motorbikes, etc.) are subject to use restrictions, pricing, parking, and speed management to limit their usage and minimize their negative impact. Restrictions on motorized two-wheelers have been implemented successfully in China, and restrictions on automobiles have been implemented in cities around the world. It is critical to address all types of motor vehicles that rely on internal combustion engines (ICE), as the growth of motor vehicle use may occur primarily through increased car use in one region but increased ICE two-wheelers in another.

The overarching policy changes enable a particularly strong increase in urban cycling. Thus the HSC scenario is predicated upon an aggressive policy agenda where tough political decisions are made at the national level and in cities around the world in favor of density, locational efficiency, mixed use, and parking management. Supporting policies directly encourage cycling, walking, and transit, through extensive infrastructure and excellent intermodal connections. In most countries, such policy decisions will require a radical shift away from the current trajectory in transportation and land-use policy. Political leaders have strong incentives to choose this path, as it leads to a dramatic reduction in societal investments and operating and energy costs, and it provides improved economic well-being, enhanced social equity and stability, and strong reductions in environmental damage over the current trajectory. Many cities and countries have already chosen this path, providing tangible evidence of the benefits that can be accrued from this type of investment.

Cycling is vital to the HSC scenario, in part because cycling rates can grow dramatically in a very short amount of time and support a substantial percentage of trips. Over the long term, it may be possible for many cities to replicate the success of cycling in cities such as Groningen, Assen, and Amsterdam in the Netherlands, where cycling exceeds 40 percent of all trips, and in Copenhagen in Denmark, which grew from low levels of cycling after World War II to more than 45 percent of trips today.[c,d] Such cities have succeeded by providing seamless infrastructure and a host of supportive policies to make cycling a safe, comfortable, and efficient option for a large number of trips. But in the short term, most efforts should be modeled after cities that have succeeded in rapidly growing cycling from very low levels, in some cases from near zero to more than 5 percent mode share in just a few years. Seville, Spain, is particularly relevant, as it grew cycling mode share from 0.5 percent to nearly 7 percent of trips in six years (2006–2012), with the number of cycling trips increasing from five thousand to seventy-two thousand per day.[c] Seville achieved this by installing a backbone network of nearly 130 kilometers of protected cycle lanes (cycle tracks) throughout the city and implementing a bike share program with 2,500 bicycles and 258 stations in a dense bike share network across the city. Paris, Buenos Aires, and Montreal have also experienced similarly rapid increases in cycling through investments in low-stress networks of cycling infrastructure and large-scale bike sharing schemes.

Substantial restraint on motor vehicle speed and volumes is the other widespread policy implementation that complements cycling infrastructure. In Europe and Japan historic city cores have kept high densities of population,

[c] http://lcc.org.uk/pages/seville-goes-dutch.

narrow streets, and often have substantial car-free zones. This was important in the case of Seville and is seen in the central zones of many Dutch cities. In the United Kingdom, which overall has a low cycling mode share, the highest mode shares are achieved in York and Cambridge, which have historic centers that have been car-free since the 1970s. Tokyo and other Japanese cities have long maintained high levels of cycling (many exceeding 20 percent of trips) through dense urban development and networks of streets designed for low speeds and low volumes of motor vehicles, which support cycling with fewer lanes for cycling.[18]

In the HSC scenario, the following policies, based on a number of best practice cycling policy recommendations[19,20] are used to quickly increase cycling levels:

- Cycling infrastructure is retrofitted onto existing streets and roads with relatively inexpensive materials to create backbone networks of low-stress bicycle routes on arterial streets, small residential streets, and even intercity roads;
- Construction includes 1 kilometer of cycling lanes (either pathways or striped lanes on city streets, along with street furniture and secure bike parking) for every 2.5 million cycling kilometers that occur each year;
- Implementation of bike share programs in large cities to connect to transit and provide initial impetus for cycling;
- Laws and enforcement practices are changed to better protect cyclists and walkers;
- Aggressive investment is also made in walking facilities and public transport to create a menu of transport options in cities that can be combined to accommodate a wide variety of trips without the need for motor vehicle use;
- Metropolitan land-use and transportation planning are coordinated so that new urban development investments are directed toward parts of the city where existing and planned cycling, walking, and public transit

Buenos Aires has seen rapid growth in cycling through the implementation of a large-scale network of protected bike lanes throughout the city. More than 140 kilometers of lanes were installed beginning in 2010. A small, three-station, manually operated bicycle sharing system began operation in 2010. This system has since expanded to two hundred stations and was converted to an automated system in 2015. These improvements have caused bicycling to jump from less than 0.5 percent of trips in 2010 to more than 3.5 percent of trips today.

In addition, many downtown streets in Buenos Aires are in the process of being pedestrianized or heavily traffic calmed, supporting active and public transportation. The city has also installed multiple bus rapid transit (BRT) corridors, knitting farther reaches of the city together, and allowing for a wide variety of trips to be completed quickly and comfortably through a combination of cycling, walking, and public transport.

Figure 20. Seville Bicycle Infrastructure

Source: CC Image courtesy of adrimcm on Flickr

Figure 21. Buenos Aires Bicycle Infrastructure

Source: ITDP

infrastructure can accommodate nearly all trips from that development without spurring additional motor vehicle use. New transportation investments are planned for areas where they can most effectively reduce existing motor vehicle use;

- Policies that had formerly supported additional motor vehicle use, such as minimum parking requirements, free parking on public streets, and fuel subsidies are eliminated;

- Policies such as congestion pricing, VKT fees, and development impact fees are adopted to charge a price for driving that accounts for negative externalities. These fees fund investment in sustainable transport;

- Funding is increased for sustainable transport to allow for high and sustained investment in cycling, walking, and public transportation infrastructure and services;

- National policies support and spur city-level change by providing funding for cities to invest in cycling and other active and public modes, and financing to help leverage existing revenue streams to spur large-scale investment;

- National governments adopt best practice standards from the best performing countries to ensure that the highest quality infrastructure is built;

- Global institutions, such as development banks, change lending practices to shift investment from roads toward cycling and other more sustainable modes.

A significant change in motor vehicle technologies is also going to happen in the time frame under consideration, complemented by a big shift in city management toward the so-called smart or connected cities with an emphasis on multimodal transport choice and transportation demand management. In an HSC scenario, it is essential that cycling be fully integrated into such policies and practices as they are developed on a number of levels. New technologies should be crafted with cycling safety in mind, exploiting the automation of driving and motor vehicle speed (Intelligent Speed Adaption) to eliminate road crash fatalities (Vision Zero), boost vehicle occupancy and utilization rates, curb demand for parking, and reallocate space for better bicycle facilities. For example, while policies promoting automated motor vehicles are attractive and may encourage some cycling, in an HSC scenario, priority is given to policies that more directly lead to mode switching, given the health, congestion, and cost benefits of shifting trips to cycling from motor vehicle use.

Regions with Low Cycling

Regions with low cycling are defined as either having very low cycling mode shares (less than 5 percent, such as in the United States) or having cycling done almost exclusively by people with low incomes. In the latter, cycling mode shares are typically declining as individuals in growing economies are able to afford alternatives to cycling.

Both of these types of countries can achieve moderate cycling levels within five years through adopting the following policy measures. Cities must first adopt rapid infrastructure implementation programs, focusing on building backbone networks of connected, high-quality bicycle facilities and bicycle-priority streets, spaced evenly roughly 1–2 kilometers apart across cities, so that it is possible to traverse the city by bicycle without encountering any stressful situations. In addition, cities should implement a large-scale rollout of bicycle sharing programs with densely spaced stations and a high ration of bicycles to residents. This allows bicycles to be used without requiring a bicycle purchase, introducing many people to cycling and allowing cycling trips to be combined with transit trips to accommodate longer trips by bicycle. Both backbone networks and bike sharing schemes can move from concept to implementation in well under five years, allowing for rapid growth in cycling. Funding for these efforts should come from reallocating existing urban roadway expansion funds toward sustainable transportation, particularly cycling infrastructure.

In tandem with improved infrastructure, cities must take the first steps to improve laws to protect people on bicycle and on foot. Laws should clarify right-of-way regulations, with some priority toward cycling and walking, and police officers should be trained to better

understand and enforce these laws.

Low-cycling cities must also take first steps to reduce motor vehicle travel. These include adopting demand-based on-street parking pricing, where the price of curbside parking is set with a goal of 85 percent occupancy. In addition to improving the allocation of curb space, this is used in tandem with the reallocation of street space, so that when, for example, parking space is reallocated to bicycle infrastructure, the demand for parking is reduced through a corresponding increase in parking price for the remaining parking spaces in the area. Cities must also develop transportation and land-use plans for directing urban growth toward parts of the city with existing and planned cycling, walking, and public transit infrastructure that can accommodate the vast majority of trips. To fund large-scale investments in cycling, walking, and transit infrastructure, cities should begin developing new funding mechanisms, such as congestion pricing and VKT fees.

National governments should adopt policies to prioritize cycling, walking, and transit at the national level. These policies include adopting best practice design standards for street design based on street design guides in the Netherlands, which is widely regarded as having designs most conducive to high levels of cycling, walking, and transit. To ensure that these designs are implemented well, national governments need to fund training for planners and engineers to understand how these guidelines work. This includes visits from Dutch and Danish engineers and planners, to provide firsthand design training and to present tactile local examples of world-class street designs. To increase the speed of infrastructure implementation, national governments also should provide funding to cities to adopt rapid cycling infrastructure programs. Bicycle network funding can often be diverted from existing urban roadway construction funds. National governments must also provide project financing to maximize the amount of infrastructure that can be built with available resources, again, to greatest effect where local governments are not able to obtain financing themselves.

National governments should also fund transportation and land-use planning efforts, requiring that plans include concrete strategies to reduce motor vehicle use. To help cities fund the implementation of such plans, national governments should also provide funding and guidance for VKT fee programs and congestion charging schemes, with the condition that the revenue from these programs be devoted to the implementation of sustainable transportation plans. National governments can also act to reduce incentives for driving, such as fuel subsidies, parking subsidies, and other policies that serve to encourage more driving. Countries should also end government funding and financing of limited access and high-capacity roads and flyovers in urban areas, and existing roads of this type should be tolled and eventually replaced with streets more conducive to sustainable transportation.

Bilateral and multilateral development banks, which typically finance projects in locations with declining levels of cycling and walking, can redirect all financing from urban roads to the financing of bicycle backbone networks, walking infrastructure, and rapid transit systems. The banks should adopt best practice design guidelines that direct investment toward the highest quality projects that are implemented in the shortest amount of time.

Regions with Moderate Cycling

Regions with moderate levels of cycling include those with 5 to 15 percent mode share and significant levels of cycling by middle-class residents. These regions can move to high levels of cycling in five to ten years through the adoption of the following policies. In cities with moderate levels of cycling, plans can be developed to improve existing infrastructure to meet best practice designs and to expand the network of bicycle infrastructure and cycle-priority (low automobile speed, low automobile volume) streets to include all streets in the city. This includes decoupling existing motor vehicle routes from cycling routes on most residential and many commercial streets. This way, cycling trips are made directly and conveniently to all destinations in a city, but automobile trips are diverted around the densest parts of cities and residential neighborhoods, while still allowing for some local access. Infrastructure improvements can also include retiming traffic signals to prioritize the efficient movement of bicycles and mass transport vehicles over other modes. This way, motor vehicle travel speeds can be further

reduced and cycling becomes a more efficient means of reaching destinations.

To boost safety, cities should adopt strict liability legislation, as currently in place in the Netherlands, which presumes that the most vulnerable users—people on bicycles and on foot—have priority at junctions, unless proved otherwise.3,10 Speed limits can be reduced in tandem with slower street designs to mitigate damage should crashes occur. Police officers should receive extensive training in the enforcement of driver behavior that most negatively impacts cycling and walking. Driver education policies should better educate drivers in safe driving, particularly around people cycling and walking.

Plans for large-scale transportation investments must be adopted and implemented, creating large networks for cycling, rapid transit, and walking, seamlessly connected through highly accessible transit stations with ample cycle parking and integrated payment schemes for transit, bike share, car share, and other forms of shared mobility. These infrastructure projects can be funded through the adoption of VKT fees and congestion pricing, which have the double effect of discouraging driving while funding effective alternative modes. These also provide a stable funding source, which cities can borrow against to implement more projects in a shorter time frame. To further reduce demand for motor vehicle travel, off-street parking policies should be revised to eliminate required parking from new development and to cap the number of parking spaces in each area based on the level of motor vehicle use that can be accommodated effectively by nearby infrastructure.

In cities with high levels of motorized two-wheeler use, policies should be adopted to restrict those vehicles and promote e-bicycles instead. E-bikes should be allowed to use urban bicycle infrastructure, but only within regulated speeds (less than 20 kilometers per hour). New restrictions must be heavily enforced to maintain a high level of comfort and safety for people on non-assisted bicycles. In addition, new higher-speed infrastructure can be built to allow e-bikes to substitute for longer-distance trips, particularly in suburban areas outside city centers. E-bikes (like bicycles) should be permitted/encouraged to move with the flow of motor vehicle traffic as speeds and safety considerations permit.

Regions with High Cycling

Regions with high cycling have mode share of 15 to 30 percent and high levels of cycling across a wide range of the population, including some cycling among the upper classes and politicians. Cities with high levels of cycling should focus on further expansion of cycling through investment in e-bike infrastructure, particularly in lower-density areas where trips are longer, transit is less prevalent, and motor vehicle use is greater. This infrastructure should be designed for slightly higher speed (30 kilometers per hour), as is currently being developed in the Netherlands. This infrastructure should allow for longer trips to be made by bicycle, with a more direct substitution for motor vehicle trips. These cities should continue to improve existing infrastructure to bring all infrastructure up to the highest standards.

These cities need to focus heavily on reducing driving in existing development and ensuring that new development does not spur additional motor vehicle use. This includes promoting the redevelopment of lower density suburbs to transform them into more urban, higher density, mixed-use areas that are more supportive of cycling, walking, and transit trips.

As self-driving cars become more prevalent, intelligent national and local policies should help guide their use as a complement to cycling, transit, and walking. Specifically, the expansion of self-driving cars should be guided toward eliminating road crash fatalities (Vision Zero), boosting vehicle occupancy and utilization rates to curb demand for parking, reducing the operating cost of transit, and removing on- and off-street parking.

Implications for COP 21

An HSC scenario, prioritizing cycling, walking, and public transport while restricting motor vehicle use, can achieve a 50 percent reduction in urban transport CO_2. The 2015 United Nations Climate Change Conference (COP 21) in Paris provides an excellent opportunity to move global policy toward supporting this scenario. To do so, cycling targets for things such as cycling mode share, cycling infrastructure investment, and the introduction of e-bikes as part of national mobility strategies could be set at the country level to define goals and measure progress toward them. Countries can make commitments to these targets as well as toward other supportive investment in walking and public

transportation necessary to achieve a future based on more sustainable transportation.

Other measures such as fiscal and tax incentives and the switching of fossil fuel subsidies to cycling and e-biking are already being discussed in Europe and could be extended elsewhere. [21]

Conclusions/Next Steps

Based on this study, it is likely that an HSC scenario will result in greatly reduced fuel consumption, emissions, and spending on transportation while maintaining high levels of access and a high quality of life. A rapid increase in cycling and e-biking in particular contributes nearly 10 percent of additional emissions reductions on top of the HS scenario shift to public transportation. Costs resulting from the shift to cycling lead to an estimated annual savings of US$700 billion per year, with a cumulative savings of US$25 trillion dollars from 2015 to 2050.

Since the HSC scenario saves money, paying for it is not problematic. Cities and countries across the spectrum of wealth have demonstrated the potential for rapid increases in cycling, and it is clear that such a scenario is entirely possible in the given time frame. However, a large amount of political will is required to change course from the BAU to implement an HSC scenario, and it is not clear if cities and countries will be able to find such will, especially given the low capacity for long-term planning in many places.

To improve on this study, better data on existing cycling rates and trends would be very useful. In particular, better data on cycling trip distances, mode shares, and trip rates around the world would help create a more accurate model. Data from developing regions, such as Africa and the Middle East, would be greatly beneficial. Data points over time for more locations would also help clarify current trends to create better projections. This data can be collected going forward through household travel surveys or from newer sources, such as cell phone data.

Finally, this research could be expanded to assess other co-benefits and impacts of greatly increased cycling. These could include the health and economic impacts of more physical activity and greater work productivity. In developed nations, for instance, the health impacts of regular cycling on populations that are otherwise often highly sedentary are remarkable, with cycling to work reducing the risk of mortality by almost 40 percent.[22] Further research could also examine the reduced social cost of traffic congestion from a future less dependent on motor vehicle use and the change to traffic injuries and deaths from streets that prioritize safe cycling and walking over driving speeds. The European Cyclists' Federation has already completed several such international studies at the EU level including health, employment, and economic impacts, and there would be considerable value in extending these to a global scale.

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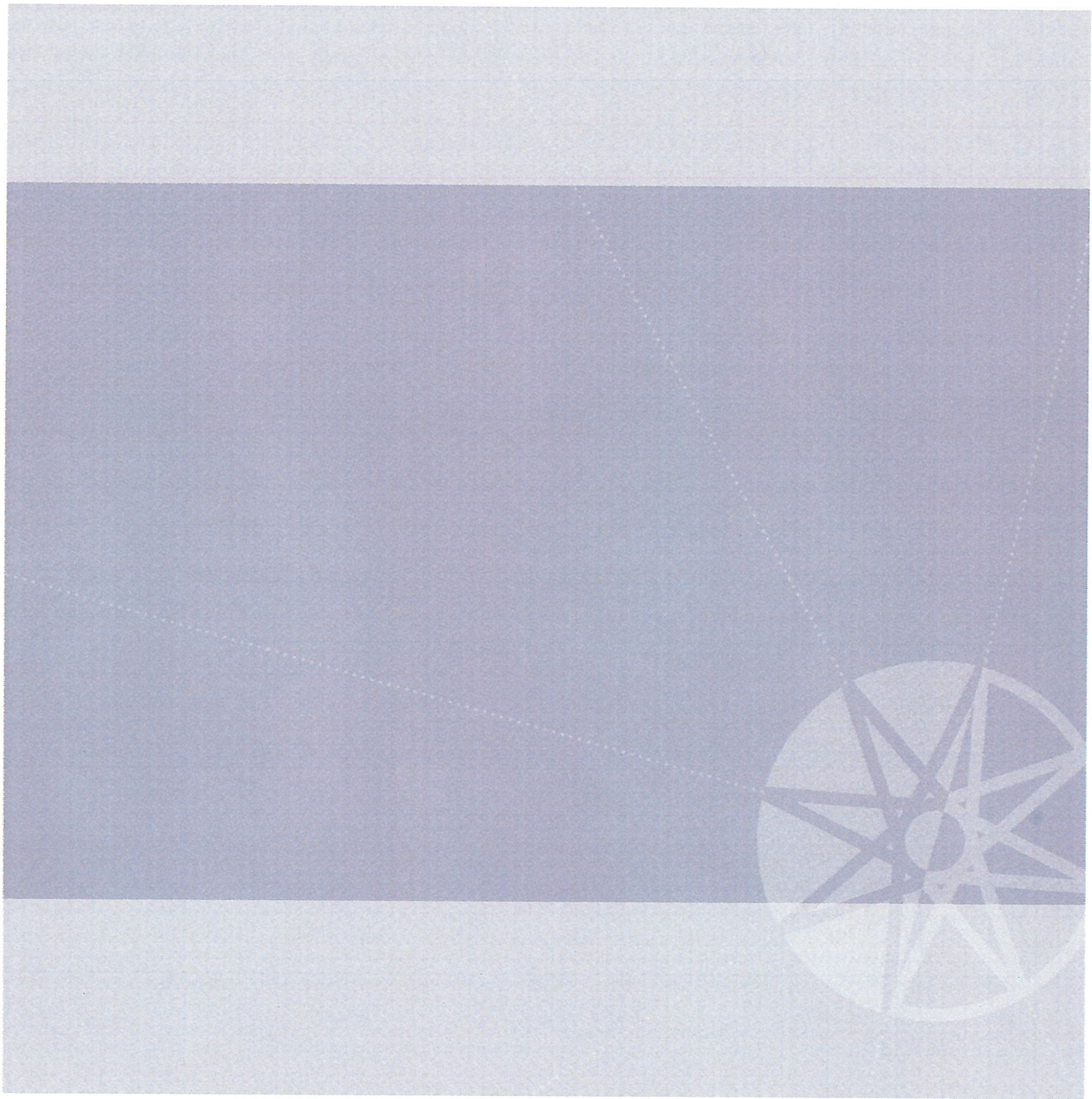

Transport Reviews
A Transnational Transdisciplinary Journal
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713766937

Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany

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First Published: July 2008

To cite this Article: Pucher, John and Buehler, Ralph (2008) 'Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany', Transport Reviews, 28:4, 495 — 528

To link to this article: DOI: 10.1080/01441640701806612
URL: http://dx.doi.org/10.1080/01441640701806612

Transport Reviews, Vol. 28, No. 4, 495–528, July 2008

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(Received 9 July 2007; revised 16 October 2007; accepted 11 November 2007)

ABSTRACT *This article shows how the Netherlands, Denmark and Germany have made bicycling a safe, convenient and practical way to get around their cities. The analysis relies on national aggregate data as well as case studies of large and small cities in each country. The key to achieving high levels of cycling appears to be the provision of separate cycling facilities along heavily travelled roads and at intersections, combined with traffic calming of most residential neighbourhoods. Extensive cycling rights of way in the Netherlands, Denmark and Germany are complemented by ample bike parking, full integration with public transport, comprehensive traffic education and training of both cyclists and motorists, and a wide range of promotional events intended to generate enthusiasm and wide public support for cycling. In addition to their many pro-bike policies and programmes, the Netherlands, Denmark and Germany make driving expensive as well as inconvenient in central cities through a host of taxes and restrictions on car ownership, use and parking. Moreover, strict land-use policies foster compact, mixed-use developments that generate shorter and thus more bikeable trips. It is the coordinated implementation of this multi-faceted, mutually reinforcing set of policies that best explains the success of these three countries in promoting cycling. For comparison, the article portrays the marginal status of cycling in the UK and the USA, where only about 1% of trips are by bike.*

Introduction

For readers in many countries, the title of this article might sound so impossible as to seem absurd. Most Britons and Americans, for example, must find cycling quite resistible indeed, since they make only about 1% of their trips by bike. Cycling conditions in most countries—including the UK and the USA—are anything but safe, convenient and attractive (Pucher *et al.*, 1999; McClintock, 2002; Pucher and Dijkstra, 2003; Tolley, 2003). Bicycling in much of the industrialized world is a marginal mode of transport, occasionally used for recreational purposes but rarely used for practical, everyday travel needs. Moreover, the

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0144-1647 print/1464-5327 online/08/040495-34 © 2008 Taylor & Francis
DOI: 10.1080/01441640701806612

social distribution of cycling tends to be very uneven, with young men doing most of the cycling, while women cycle far less, and the elderly hardly cycle at all.

Thus, it may come as a surprise to sceptical readers that there are technologically advanced, affluent countries that have managed to make cycling a mainstream mode of transport, a perfectly normal way to get around cities. In the Netherlands, Germany and Denmark, cycling levels are more than ten times higher than in the UK and the USA. Dutch, German and Danish women cycle as often as men, and rates of cycling fall only slightly with age. Moreover, cycling is distributed evenly across all income groups. In the Netherlands, Germany and Denmark, cycling is truly for everyone and for all trip purposes.

Moreover, cycling in those countries is not viewed as requiring expensive equipment, advanced training, or a high degree of physical fitness. Nor are cyclists forced to muster the courage and willingness to battle motorists on streets without separate bike lanes or paths. On the contrary, Dutch, German and Danish cyclists ride on simple, inexpensive bikes, almost never wear special cycling outfits, and rarely use safety helmets. Even timid, risk-averse and safety-conscious individuals can be found cycling, unlike the many millions of Americans and Britons who are terrified by the mere thought of getting on a bike.

As documented in this article, cycling was not always thriving in the Netherlands, Germany and Denmark. Cycling levels plummeted in all three countries from about 1950 to 1975 (Dutch Bicycling Council, 2006). It was only through a massive reversal in transport and urban planning policies in the mid-1970s that cycling was revived to its current successful state. In 1950, cycling levels were higher in the UK than they are now in Germany: almost 15% of all trips. Just as in these other countries, cycling in the UK plummeted from 1950 to 1975, but British cycling never recovered. It continued to fall to its current level of 1.3% of trips, only slightly higher than the 0.9% bike share of trips in the USA (U.S. Department of Transportation, 2003; Department for Transport, 2007).

While history, culture, topography and climate are important, they do not necessarily determine the fate of cycling. Government policies are at least as important: transport policies, land-use policies, urban development policies, housing policies, environmental policies, taxation policies and parking policies. In many respects, the UK and the USA have given the green light to the private car, almost regardless of its economic, social and environmental costs. In sharp contrast, cycling has prospered in the Netherlands, Germany and Denmark over the past three decades precisely because these countries have given the red light, or at least the yellow warning light, to private cars. Instead of catering to ever more motor vehicles by expanding roadways and parking facilities, Dutch, German and Danish cities have focused on serving people, making their cities people-friendly rather than car-friendly, and thus more liveable and more sustainable than American and British cities.

There are many good reasons to encourage more cycling. It causes virtually no noise or air pollution and consumes far less non-renewable resources than any motorized transport mode. The only energy cycling requires is provided directly by the traveller, and the very use of that energy offers valuable cardiovascular exercise. Cycling requires only a small fraction of the space needed for the use and parking of cars. Moreover, cycling is economical, costing far less than both the private car and public transport, both in direct user costs and public infrastructure costs. Because it is affordable by virtually everyone, cycling is among the most equitable of all transport modes. In short, it is hard to beat cycling when

it comes to environmental, social and economic sustainability. Consequently, both the European Union (EU) and the USA have officially recognized the importance of cycling as a practical mode of urban transport and endorse the dual objectives of raising cycling levels while increasing cycling safety (U.S. Department of Transportation, 1994, 2004; European Conference of the Ministers of Transport, 2004).

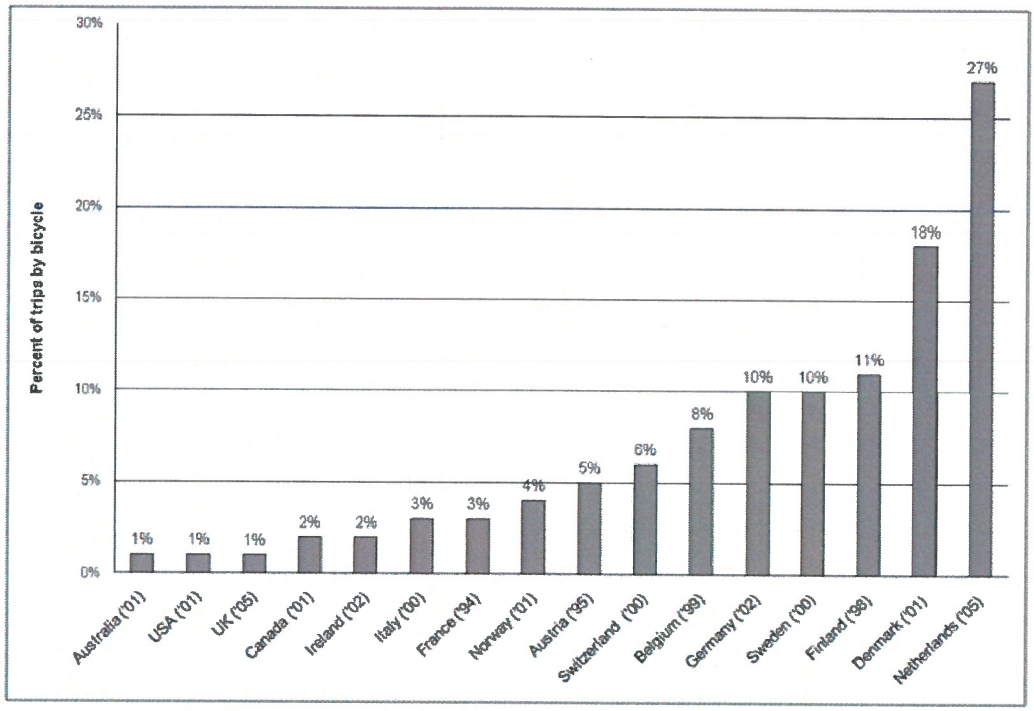
As shown in this article, countries vary greatly in the degree to which these stated objectives have been met. The Netherlands, Denmark and Germany have been at the forefront of policies to make cycling safe, convenient and attractive, while the UK and the USA have lagged far behind. Differences between these countries in cycling levels are enlightening because all five of them are democratic, capitalist, affluent societies with nearly universal car ownership. The success of cycling does not depend on poverty, dictatorial regimes or the lack of motorized transport options to force people onto bikes. This article shows how the Netherlands, Denmark and Germany have managed to make cycling a popular, mainstream way of getting around cities.

First, however, we document differences among countries in their overall levels of cycling, in bike trip purposes, and in the gender, age and income levels of cyclists. Differences in cycling safety explain some of the difference in cycling levels among countries; thus, the article contains an entire section with comparisons of cycling fatality and injury rates and trends over time. Subsequent sections summarize the range of policies and programmes used in the Netherlands, Denmark and Germany to promote cycling by a broad spectrum of society and at the same time improve cycling safety. The article concludes with an overall assessment of the lessons that can be learned from these countries to make cycling safer, more convenient and more attractive in other countries as well.

Variations among Countries in Overall Cycling Levels

As shown in Figure 1, there are large differences among Australia, the USA, Canada and European countries in the bike share of trips, ranging from a low of 1% in Australia, the UK and the USA to 27% in the Netherlands. These differences in the bike share of trips roughly parallel differences in the average distance cycled per person per day, an alternative way of measuring and comparing cycling levels among countries. Averaging over the entire population of each country, the European Conference of the Ministers of Transport (2004) estimated that per capita cycling per day ranges from 0.1 km in Spain, Greece and Portugal to 2.5 km in the Netherlands (see Figure 2). Denmark (1.6 km) and Germany (0.9 km) immediately follow the Netherlands in distance cycled per inhabitant. The USA and the UK are both at the low end of the spectrum, averaging 0.1 km and 0.2 km of cycling per person per day, respectively.

These national averages hide large variations in cycling levels between cities within each country, as shown in Figure 3. With only a few exceptions, however, even the most bike-oriented cities in the UK, Australia, Canada and the USA generally have bike shares of travel that are lower than the least bike-oriented cities in the Netherlands, Denmark and Germany. No British, Canadian, Australian or American city even approaches the bike share of trips in most Dutch and Danish cities. Only a few German cities have bike mode shares lower than 5%, while all Canadian, Australian and American cities, and most British cities, have bike shares that low.



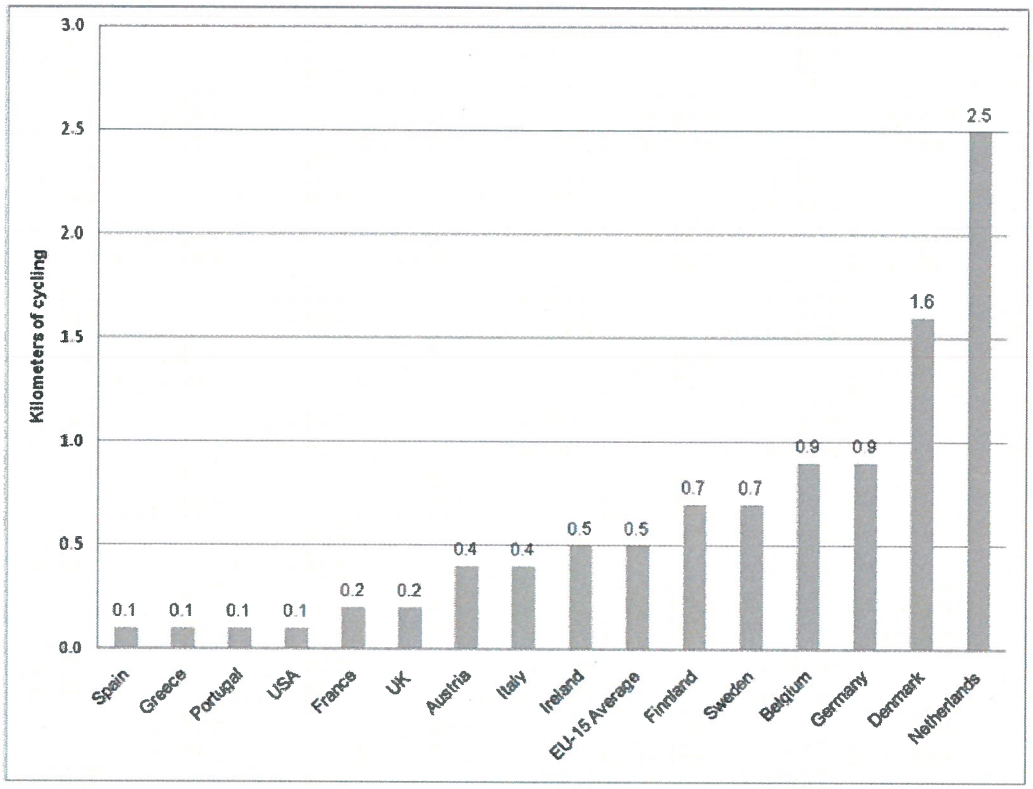
Sources: European Union (2003); German Federal Ministry of Transport (2003); U.S. Department of Transportation (2003); European Conference of the Ministers of Transport (2004); Department for Transport (2005); Organisation for Economic Cooperation and Development (2005); Netherlands Ministry of Transport (2006); Australian Bureau of Statistics (2007)

Figure 1. Bicycle share of trips in Europe, North America and Australia (percentage of total trips by bicycle).

These statistics on cycling levels reflect data from national ministries of transport, central statistical bureaus and supplementary city travel surveys. They are not entirely comparable because travel surveys vary somewhat according to variable definitions, data collection method and frequency, target population, sample size and response rates (Kunert *et al.*, 2002). At the very least, however, such travel surveys facilitate approximate comparisons of different levels of cycling among countries and cities, and whatever their limitations, they are the best available sources of information.

One might expect that Europeans cycle more than Americans due to shorter trip lengths in European cities. Indeed, a considerably higher percentage of all trips in European cities are shorter than 2.5 km: 44% in the Netherlands, 37% in Denmark and 41% in Germany, compared to 27% in the USA (German Federal Ministry of Transport, 2003; U.S. Department of Transportation, 2003; National Statistical Office of Denmark, 2005; Statistics Netherlands, 2007). In the UK, only 30% of trips are shorter than 2.5 km, much closer to the American level, perhaps due to more extensive sprawl in Britain than in the Netherlands, Denmark and Germany (Department for Transport, 2007).

Even controlling for trip distance, however, the Dutch, Danes and Germans make a much higher percentage of their local trips by bike. As shown in Figure 4, both Americans and Britons cycle for only 2% of their trips shorter than 2.5 km, compared to 37% in the Netherlands, 27% in Denmark and 14% in Germany. That pattern also holds for the progressively longer trip distance categories shown in Figure 4. For trips between 2.5 and 4.4 km, for example, Americans and Britons make just 1% of their trips by bike, compared to much higher bike mode



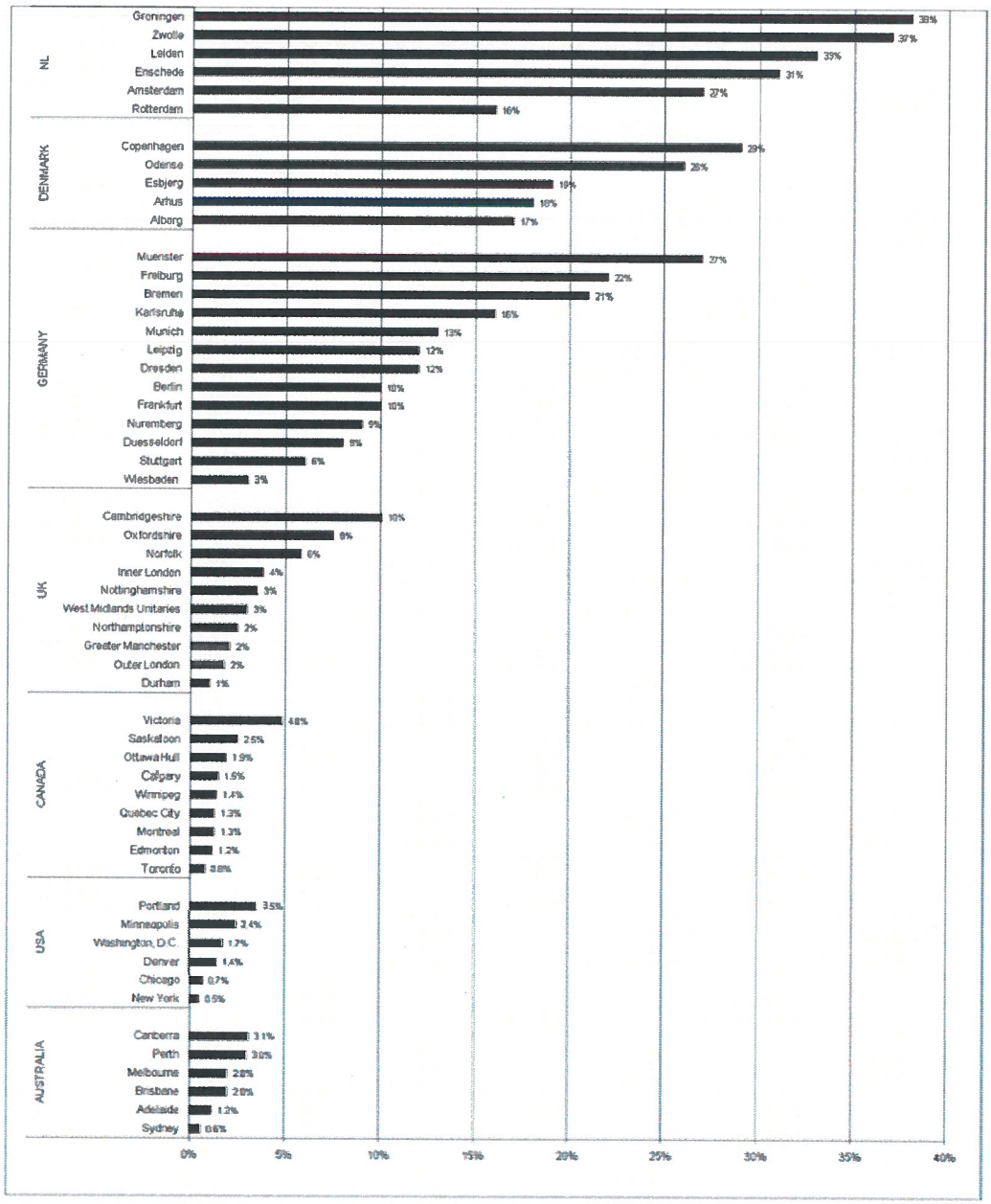
Sources: European Union (2002); U.S. Department of Transportation (2003)

Figure 2. Kilometres cycled per inhabitant per day in Europe and the USA.

shares for the same trip distance in the Netherlands (37%), Denmark (24%) and Germany (11%).

Northern Europeans—even Britons—are far more likely than Americans to cycle for practical, utilitarian purposes. Travel to work or school accounts for only 11% of all bike trips in the USA, compared to 28% in Germany, 30% in the UK, 32% in the Netherlands and 35% in Denmark. Even more strikingly, shopping trips account for only 5% of all bike trips in the USA, compared to 20% in Germany, 22% in the Netherlands and 25% in Denmark (U.S. Department of Transportation, 2003; German Federal Ministry of Transport, 2003; Netherlands Ministry of Transport, 2006; Danish Ministry of Transport, 2007; Department for Transport, 2007). Roughly three-fourths of all bike trips in the USA are for recreation, compared to 38% in Germany, 35% in the UK, 27% in the Netherlands and only 10% in Denmark.

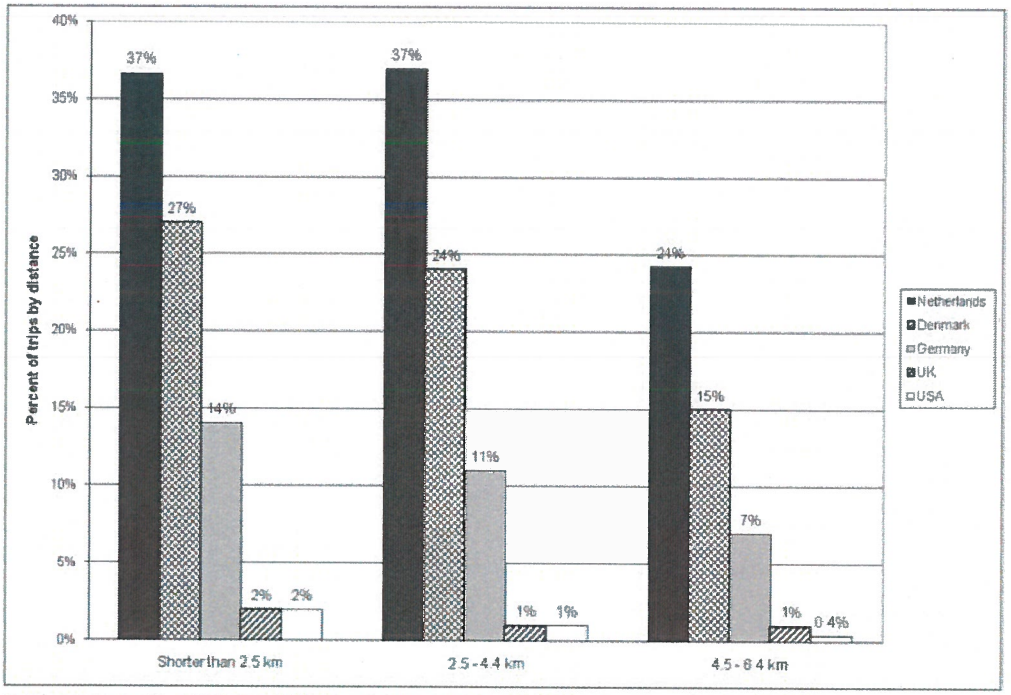
The Netherlands, Denmark and Germany have been among the most successful countries at promoting cycling for daily travel. Since all three countries are quite affluent, their high levels of cycling are not due to an inability to afford more expensive transport modes. Indeed, levels of car ownership in the three countries are among the highest in the world. The case of Germany is particularly noteworthy. Although it has a much higher level of car ownership than the UK, the bike share of trips in Germany is almost ten times higher in Germany than in the UK. Clearly, high levels of car ownership do not preclude cycling. Thus, an examination of the successful pro-cycling policies and programmes in the Netherlands, Denmark and Germany may provide especially useful lessons for increasing cycling in other countries with high incomes and widespread car ownership.



Sources: Andersen (2005); Department for Transport (2006); Dutch Bicycling Council (2006); Australian Bureau of Statistics (2007); Netherlands Ministry of Transport (2007); Socialdata (2007); Statistics Canada (2007)

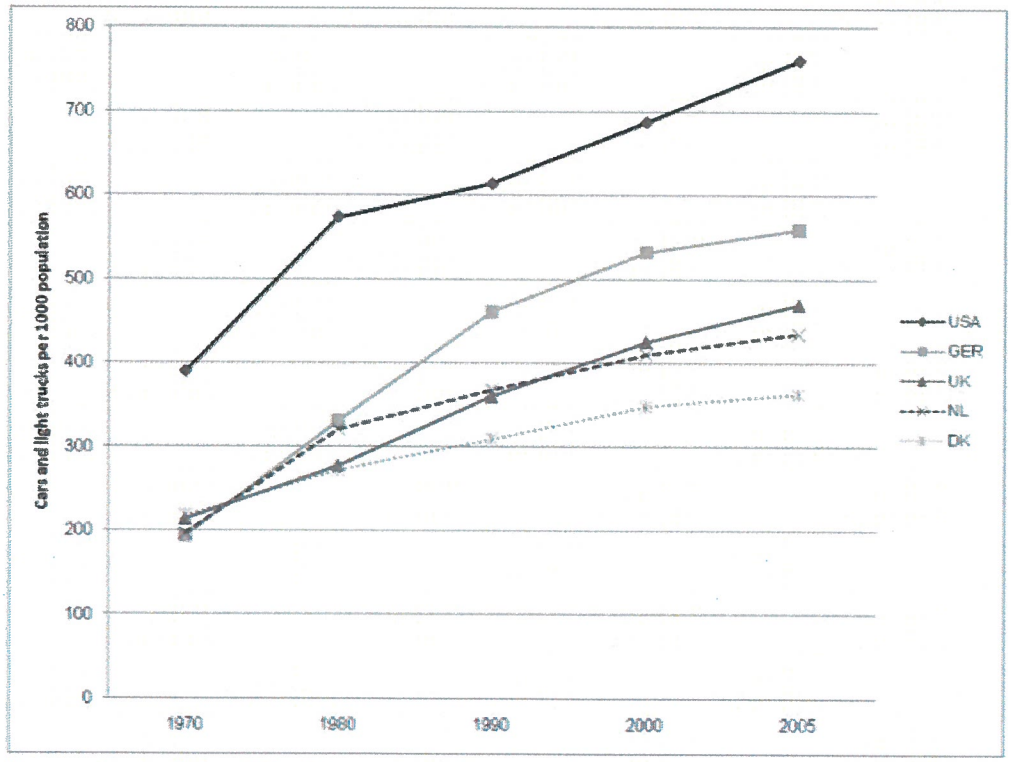
Figure 3. Bike share of trips in selected cities in the Netherlands, Denmark, Germany, the UK, Canada, the USA and Australia (2000–2005). *Note*: UK data are for counties.

One can view the same information in another light. As shown in Figure 5, car ownership per capita has increased in the Netherlands, Denmark and Germany over the past few decades but remains much lower than in the USA. That is partly due to high taxes on car ownership and use in most European countries. But it is also due to excellent alternatives to the private car in the Netherlands, Denmark and Germany, including cycling as well as walking and public transport. As is most evident in Denmark and the Netherlands, safe and convenient cycling reduces the need for car ownership.



Sources: German Federal Ministry of Transport (2003); U.S. Department of Transportation (2003); Department for Transport (2005); Netherlands Ministry of Transport (2006); Danish Ministry of Transport (2007)

Figure 4. Bicycling share of short trips in the Netherlands, Denmark, Germany, the UK and the USA (2000–2005).



Sources: European Union (2006); U.S. Department of Transportation (2007)

Figure 5. Trend in car and light truck ownership per 1000 population in the USA, Germany, the UK, the Netherlands and Denmark (1970–2005).

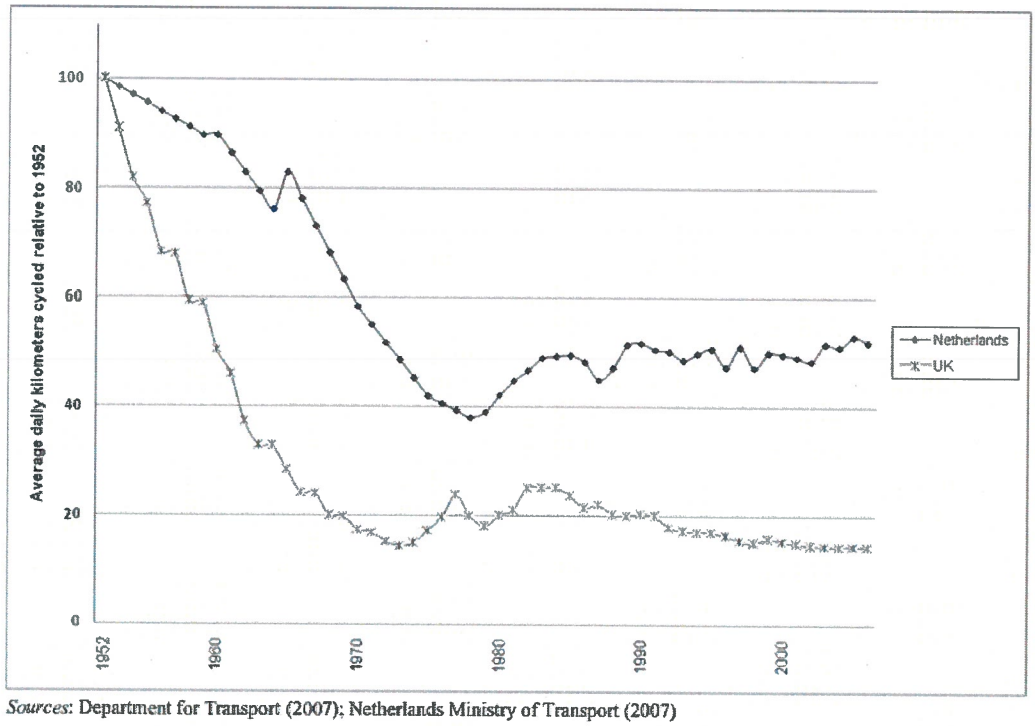
Some readers might assume that bicycling levels in Europe have been consistently high. In fact, cycling fell sharply during the 1950s and 1960s, when car ownership surged and cities started spreading out. From 1950 to 1975, the bike share of trips fell by roughly two-thirds in a sample of Dutch, Danish and German cities, from 50%–85% of trips in 1950 to only 14–35% of trips in 1975 (Dutch Bicycling Council, 2006). Similarly, a study by the City of Berlin (2003) found that the number of bike trips there fell by 78% from 1950 to 1975. During that 25-year period, cities throughout the Netherlands, Denmark and Germany focused on accommodating and facilitating increased car use by vastly expanding roadway capacity and parking supply, while largely ignoring the needs of pedestrians and cyclists (Hass-Klau, 1990).

In the mid-1970s, transport and land-use policies in all three countries shifted dramatically to favour walking, cycling and public transport over the private car. The policy reform was a reaction to the increasingly harmful environmental, energy and safety impacts of rising car use (Hass-Klau, 1990; Pucher, 1997; European Conference of the Ministers of Transport, 2004; Dutch Bicycling Council, 2006). Most cities improved their bicycling infrastructure while imposing restrictions on car use and making it more expensive. That policy reversal led to turnarounds in the previous decline of bike use. From 1975 to 1995, the bicycling share of trips in the same, previously cited sample of Dutch, Danish and German cities rose by roughly one-fourth, resulting in 1995 bike shares of 20–43%. In Berlin, the total number of bike trips nearly quadrupled from 1975 to 2001 (increasing by 275%), reaching 45% of the 1950 bicycling level (City of Berlin, 2003). The rebound in cycling from 1975 onward was not enough to offset the huge declines from 1950 to 1975. Nevertheless, it was a significant accomplishment and provides evidence of the powerful impact of policy on travel behaviour. It is especially impressive given continuing growth in per-capita income, car ownership and suburban development in all three countries over the past three decades.

The Netherlands and the UK provide striking contrasts in their long-term cycling trends (see Figure 6). Over the period 1952 to 1975, cycling in the UK fell by 80%, compared to a drop of 62% in the Netherlands. Cycling in both countries rebounded somewhat during the ten years from 1975 to 1985. In the next 20 years, however, cycling resumed its long-term decline in the UK, whereas cycling levels continued to increase in the Netherlands. The overall result is that by 2006, the cycling level in the UK was less than a seventh of its 1952 level (13%), while cycling in the Netherlands was at slightly more than half of its 1952 level (52%).

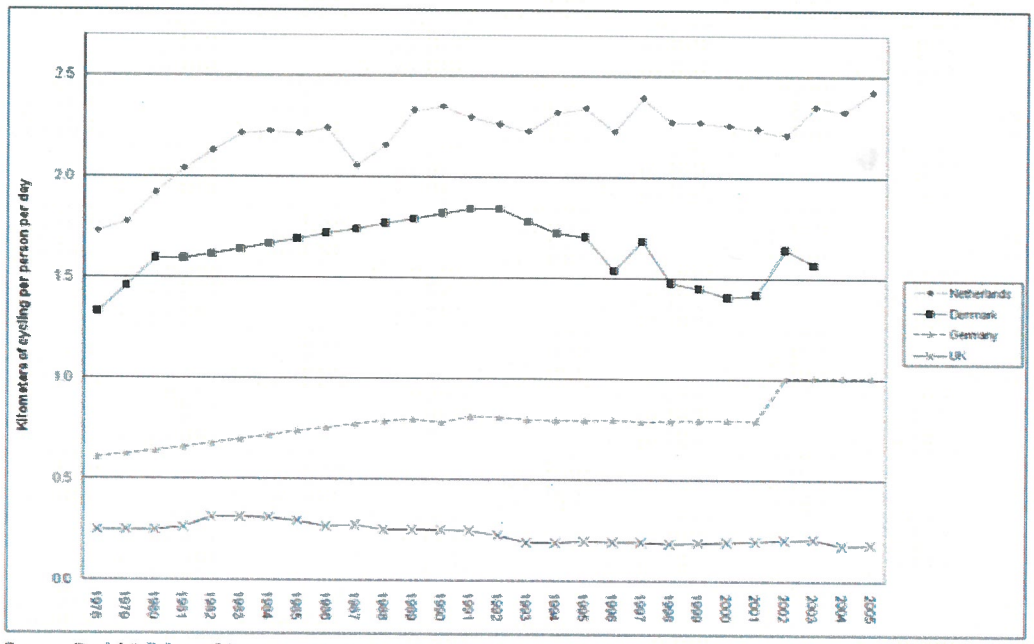
Analysis of national aggregate data for the past few decades confirms a rebound in cycling in the Netherlands, Denmark and Germany since the 1970s. As shown in Figure 7, average daily kilometres cycled per inhabitant rose in all three countries from 1978 to 2005: from 0.6 to 1.0 in Germany, from 1.3 to 1.6 in Denmark and from 1.7 to 2.5 in the Netherlands. In both the Netherlands and Denmark, the strongest growth in cycling was from the mid-1970s until the early 1990s. By comparison, average daily kilometres cycled in the UK have fallen almost continuously since 1978, declining by a third: from 0.3 to 0.2.

Not only do the Netherlands, Denmark and Germany have high and growing levels of cycling, but their cyclists comprise virtually all segments of society (see Figure 8). Women are just about as likely to cycle as men, making 45% of all bike trips in Denmark, 49% in Germany and 55% in the Netherlands. While cycling is



Sources: Department for Transport (2007); Netherlands Ministry of Transport (2007)

Figure 6. Trend in kilometres cycled per inhabitant per year in the Netherlands and the UK (1952–2006) (percent relative to 1950 level).



Sources: Danish Ministry of Transport (2007); Department for Transport (2007); German Federal Ministry of Transport (2007); Netherlands Ministry of Transport (2007)

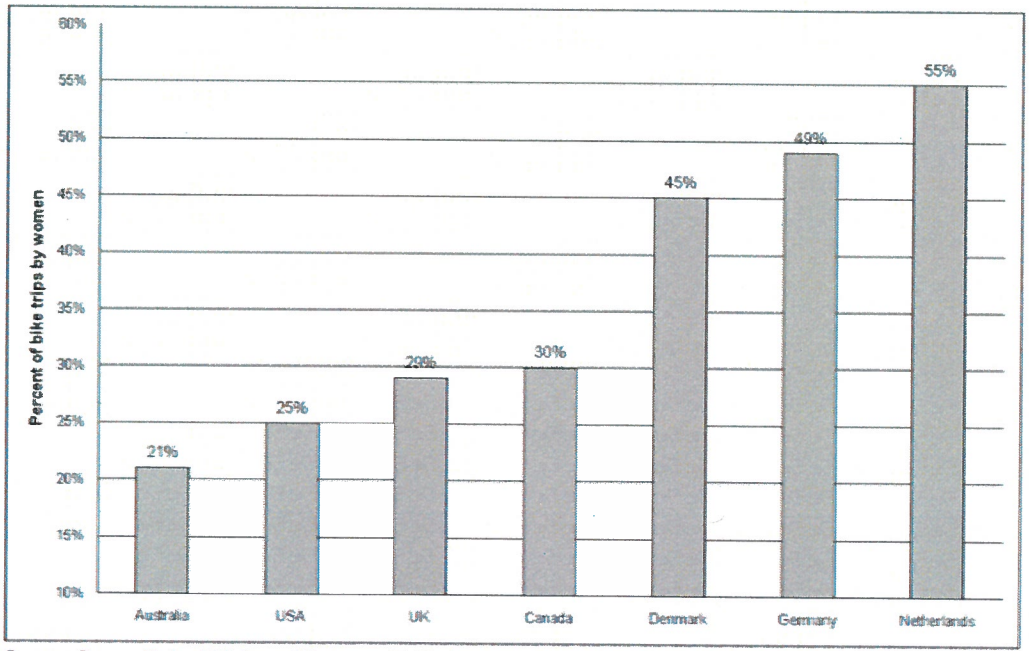
Figure 7. Trend in kilometres cycled per inhabitant per day in the Netherlands, Denmark, Germany and the UK (1978–2005).

gender-neutral in those three countries, men dominate cycling in the UK and the USA, where they make 72% and 76% of all bike trips, respectively.

Another dimension of cycling's universality in the Netherlands, Denmark and Germany is the representation of all age groups. Children and adolescents have the highest rates of cycling in almost every country. As shown in Figure 9, however, cycling levels in the Netherlands, Denmark and Germany remain high even among the elderly. In Germany, the bike share of trips rises steadily from 7% among 18- to 24-year olds to 12% for those 65 and older. The bike share of trips declines with age in Denmark, but even among those aged 70–74 years old, cycling accounts for 12% of all trips, the same as among Germans who are 65 and older. The Dutch elderly double that percentage, making 24% of all their trips by bike.

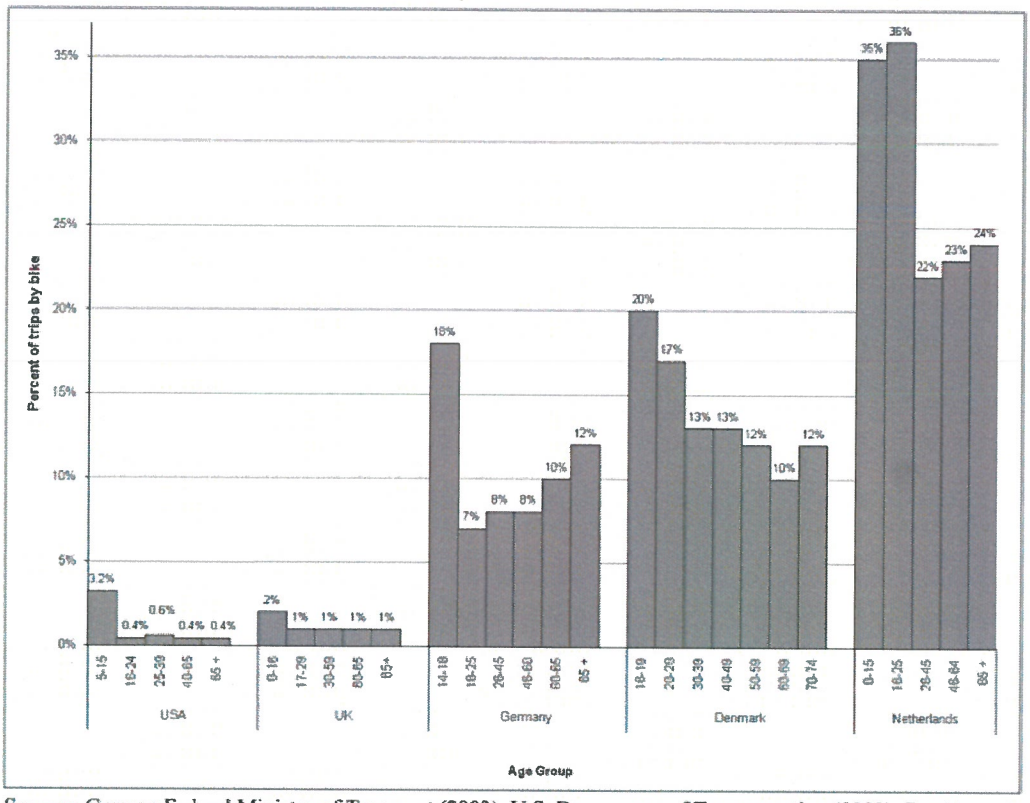
Cycling rates are low for all age groups in the USA, but they also decline with age: from 3.2% among children 5–15 years old to only 0.4% of trips for those 40 and older (see Figure 9). Similarly, the bike share of trips falls from 2% among British children to 1% among older age groups. The bike share of trips for the Dutch elderly is 24 times higher than for British elderly and 60 times higher than for American elderly. The bike share of trips for both the German and Danish elderly is 12 times higher than for British elderly and 30 times higher than for American elderly.

Rates of cycling are similar across different income classes, not only in the Netherlands, Denmark and Germany, but also in the UK and the USA (German Federal Ministry of Transport, 2003; U.S. Department of Transportation, 2003; Department for Transport, 2006; Danish Ministry of Transport, 2007; Statistics Netherlands, 2007). In the Netherlands, Germany and the UK, low-income



Sources: German Federal Ministry of Transport (2003); U.S. Department of Transportation (2003); Danish Ministry of Transport (2005); Statistics Netherlands (2005); Australian Bureau of Statistics (2007); Department for Transport (2007) and information provided directly by bike planners in Canadian provinces and cities

Figure 8. Women's share of total bike trips in Australia, the USA, the UK, Canada, Denmark, Germany and the Netherlands (2000–2005).



Sources: German Federal Ministry of Transport (2003); U.S. Department of Transportation (2003); Danish Ministry of Transport (2005); Statistics Netherlands (2005); Department for Transport (2007)

Figure 9. Bicycling share of trips by age group in the USA, the UK, Germany, Denmark and the Netherlands (2000–2002).

groups cycle only slightly more than high-income groups. By comparison, the poor in the USA cycle for a slightly lower percentage of their trips than the affluent, but the difference is negligible (0.8% vs. 0.9%). Thus, cycling appears to be the most equitable of all transport modes, at least in terms of usage across income classes.

The remainder of this article examines how Germany, the Netherlands and Denmark have succeeded in making cycling a safe and convenient way to get around their cities.

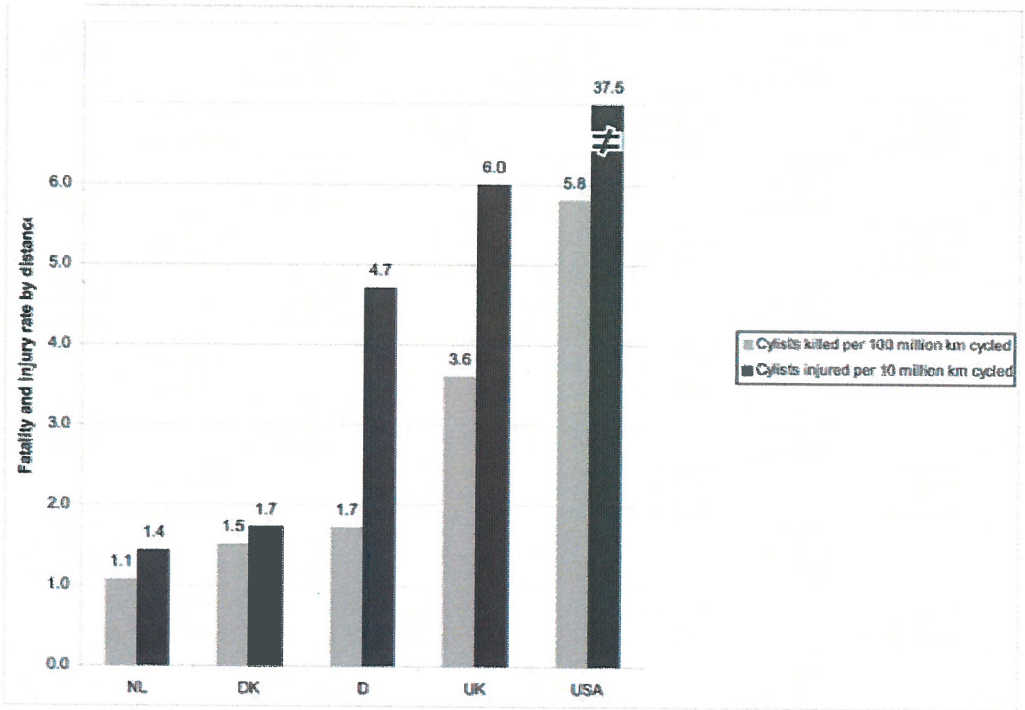
Trends in Cycling Safety

Perhaps the most important reason for the higher levels of cycling in the Netherlands, Denmark and Germany—especially among women, children and the elderly—is that cycling is much safer there than in the USA and the UK. Both fatality and injury rates are much higher for cyclists in the USA and the UK than in Germany, Denmark and the Netherlands. Averaged over the years 2002 to 2005, the number of bicyclist fatalities per 100 million km cycled was 5.8 in the USA and 3.6 in the UK, compared to 1.7 in Germany, 1.5 in Denmark, and 1.1 in the Netherlands (see Figure 10). Thus, cycling is over five times as safe in the Netherlands as in the USA and more than three times as safe as in the UK. That might explain why the Dutch do not perceive cycling as a dangerous way to get around. Cycling in

Germany and Denmark is not quite as safe as in the Netherlands, but it is three to four times safer than in the USA and twice as safe as in the UK.

Serious cycling injuries outnumber cycling fatalities roughly ten-fold in most countries (Organisation for Economic Cooperation and Development, 2007). Thus, it is important to consider non-fatal injury rates as well. Figure 10 compares non-fatal injury rates per 10 million km cycled side by side with fatality rates per 100 million km cycled. For all five countries, these statistics rely on police reports. Without exception, the cycling safety ranking for countries is the same for injuries as for fatalities. Thus, the Netherlands has the lowest non-fatal injury rate as well as the lowest fatality rate, while the USA has the highest non-fatal injury rate as well as the highest fatality rate. Indeed, the non-fatal injury rate for the USA is about 8 times higher than for Germany and about 30 times higher than for the Netherlands and Denmark. The injury rate in the UK is second highest, but much lower than in the USA.

The cyclist injury rate for the USA seems extremely high relative to the other countries. Yet it vastly underestimates total cycling injuries. It only includes cycling injuries resulting from crashes with motor vehicles on roadways and reported by the police (U.S. Department of Transportation, 2007). By comparison, the Center for Disease Control and Prevention (2007), the official public health agency of the U.S. Government, reports ten times more cycling injuries per year (479 963 vs. 45 000 in 2005), based on reports from emergency rooms of hospitals. As documented by the Organisation for Economic Cooperation and Development (2007), the official statistics of other countries also underestimate total cyclist injuries to varying



Sources: Danish Ministry of Transport (2007); Department for Transport (2007); German Federal Ministry of Transport (2007); Netherlands Ministry of Transport (2007); U.S. Department of Transportation (2007)

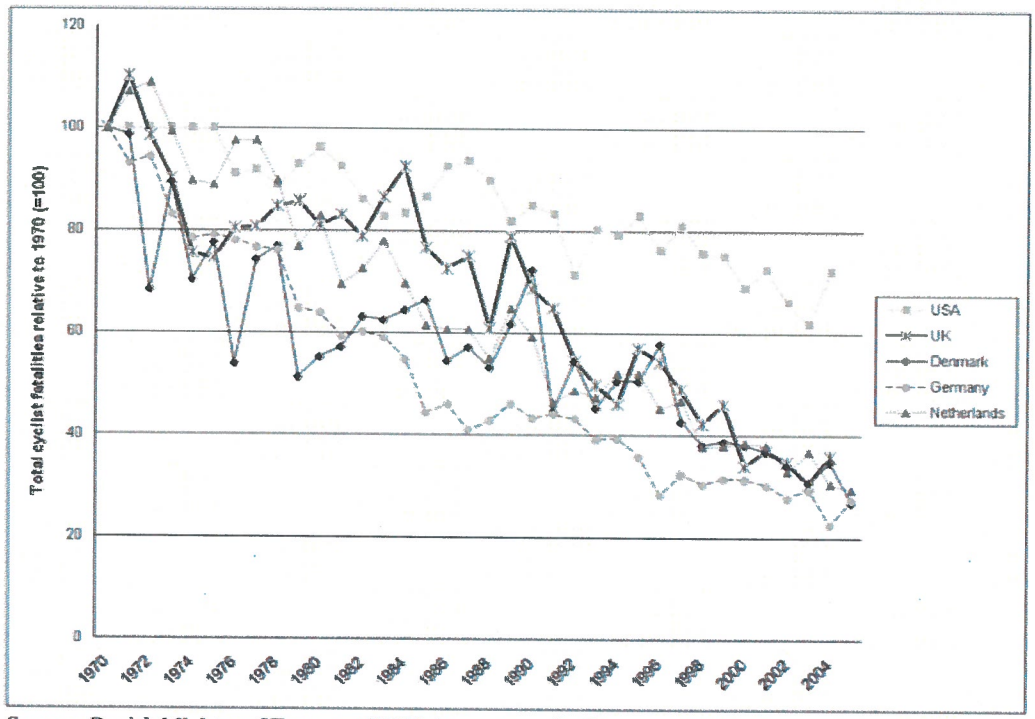
Figure 10. Fatality rates and non-fatal injury rates in the Netherlands, Denmark, Germany, the UK and the USA (2004–2005).

degrees. The documented ten-fold underreporting in the USA highlights the poor and variable quality of data on cycling injuries.

There are always problems comparing injury statistics across different countries because of differences in definitions and methodologies of data collection (Pucher and Dijkstra, 2000, 2003). Whether a cycling injury is reported in official statistics depends on the type of injury, where it occurs, whether it involves a motor vehicle, and whether it requires emergency medical assistance or a hospital visit. Many, if not most, cycling injuries are not reported at all. Even serious cycling injuries are underreported, as shown by the American case. Thus, the cycling injury rates reported in Figure 10 are less accurate and less comparable than the corresponding fatality rates. Nevertheless, both measures indicate much safer cycling in the Netherlands and Denmark than in the UK and the USA, with Germany in between.

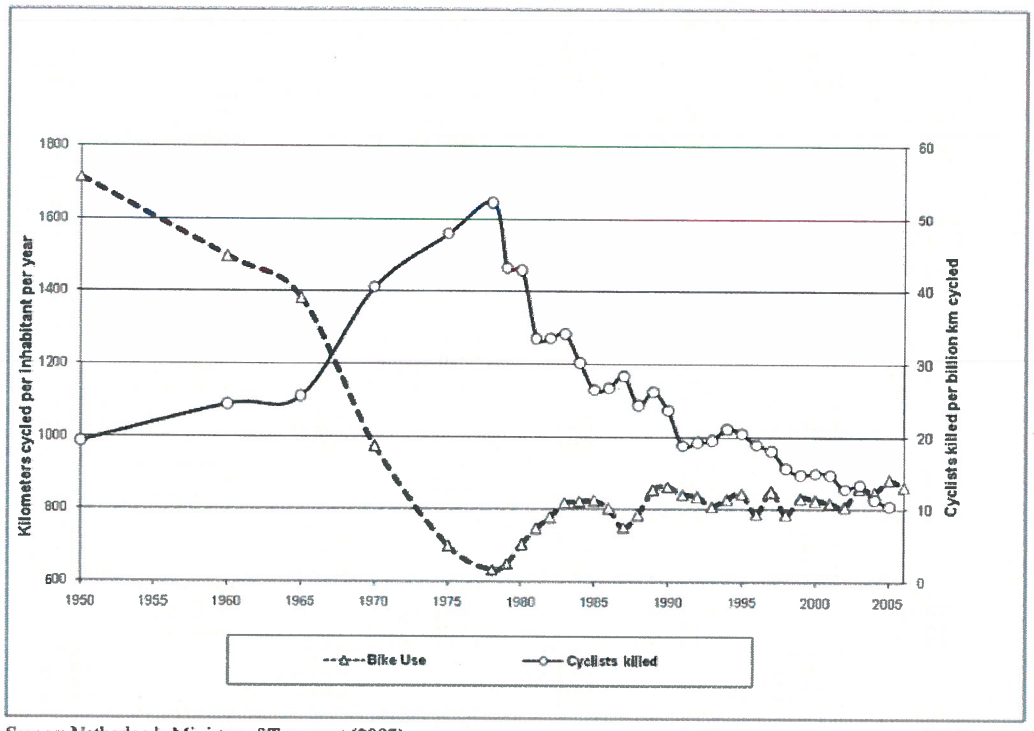
As shown in Figure 11, Germany, Denmark and the Netherlands have greatly improved cycling safety since 1970. Although levels of cycling have increased in all three countries over the past 35 years (as already shown in Figure 7), the total number of cycling fatalities has declined by over 70%. Fatalities fell by 60% in the UK over the same period, but the amount of cycling also decreased. The least improvement in cycling safety has been in the USA, where fatalities fell by only 30%.

Longer term data are available for the Netherlands. They dramatically portray the strong relationship between cycling safety and levels of cycling (see Figure 12). During the 1950s and 1960s, car use rose rapidly in the Netherlands. Insufficient supply of both roadways and separate cycling facilities generated dangerous



Sources: Danish Ministry of Transport (2007); Department for Transport (2007); German Federal Ministry of Transport (2007); Netherlands Ministry of Transport (2007); U.S. Department of Transportation (2007)

Figure 11. Trend in cycling fatalities in the USA, the UK, Denmark, Germany and the Netherlands (1970–2005) (percentage relative to 1970 level).



Source: Netherlands Ministry of Transport (2007)

Figure 12. Inverse trends in cycling fatality rates and annual kilometres cycled per inhabitant in the Netherlands (1950–2005).

traffic conflicts and an alarming increase in cycling fatalities (Dutch Bicycling Council, 2006; Netherlands Ministry of Transport, 2006). As the cyclist fatality rate per billion km cycled rose by 174% from 1950 to 1978, the average km cycled per inhabitant fell by 65%. Since the mid-1970s, Dutch cities have undertaken massive improvements to cycling infrastructure and restricted car use (Netherlands Ministry of Transport, 1999, 2006). The result has been an 81% fall in the cyclist fatality rate from 1978 to 2006, thus encouraging a 36% increase in km cycled per inhabitant. This statistical relationship, of course, does not prove causation, but there is every reason to believe that increased safety is a key to promoting more cycling (Rietveld and Daniel, 2004).

There is also reason to believe that more cycling facilitates safer cycling. The phenomenon of 'safety in numbers' has consistently been found to hold over time and across cities and countries. Fatality rates per trip and per km are much lower for countries and cities with high bicycling shares of total travel, and fatality rates fall for any given country or city as cycling levels rise (Jacobsen, 2003).

Most surveys show that the perceived traffic danger of cycling is an important deterrent to more widespread cycling (Noland, 1994; Dutch Bicycling Council, 2006). Women and the elderly appear to be especially sensitive to such traffic danger (Garrard *et al.*, 2008). Many American parents do not allow their children to cycle for the same reason. As shown in Figure 10, cycling in the USA is indeed dangerous in comparison with other countries. Thus, making cycling safer is surely one of the keys to increasing overall cycling levels in the USA, particularly among women, the elderly and children.

In the USA, much of the effort to improve cyclist safety has focused on increasing helmet use, if necessary by law, especially for children. Thus, it is important to emphasize that the much safer cycling in northern Europe is definitely *not* due to widespread use of safety helmets. On the contrary, in the Netherlands, with the safest cycling of any country, less than 1% of adult cyclists wear helmets, and even among children, only 3–5% wear helmets (Dutch Bicycling Council, 2006; Netherlands Ministry of Transport, 2006). The Dutch cycling experts and planners interviewed for this article adamantly oppose laws to require the use of helmets, claiming that helmets discourage cycling by making it less convenient, less comfortable and less fashionable. They also mention the possibility that helmets would make cycling more dangerous by giving cyclists a false sense of safety and thus encouraging riskier riding behaviour. At the same time, helmets might reduce the consideration motorists give cyclists, since they might seem less vulnerable if wearing helmets (Walker, 2007).

German and Danish cycling planners seem far more supportive of increased helmet use, especially among children (Danish Ministry of Transport, 2000; German Federal Ministry of Transport, 2002; City of Muenster, 2004; Andersen, 2005; Boehme, 2005). There have been extensive promotional campaigns in these two countries to encourage more helmet use, but there are no laws requiring helmet use, not even for young children. In 2002, 33% of German children aged 6–10 years wore helmets while cycling, compared to 9% of adolescents aged 11–16 and 2% of Germans aged 17 or older. In 2006, 66% of Danish school children aged 6–10 wore helmets, compared to 12% among school children 11 years or older, and less than 5% among adults.

Government Roles in Funding and Planning Cycling Facilities and Programmes in The Netherlands, Denmark and Germany

Due to the mostly local, short-distance trips made by bike, policies and programmes to promote safe and convenient cycling are usually carried out at the municipal level (European Conference of the Ministers of Transport, 2004). Local governments in the Netherlands, Germany and Denmark have been planning, constructing and funding bicycling facilities for many decades, at least since the 1970s but much earlier in some cities. Municipalities are responsible for making the specific plans that reflect the particular conditions and needs of the local context. Cycling training, safety and promotional programmes are usually carried out at the local level as well, even if they are mandated and funded by higher levels. At the intermediate level, states, counties and regional governments provide additional policy guidance, coordination and funding, as well as some direct planning and construction of cycling facilities that serve rural areas or provide links between municipalities.

Central government involvement in cycling has been more recent, evolving gradually since about 1980 and providing overall goals, design guidelines, research support, model projects, coordination and funding. The Netherlands, Denmark and Germany all have official National Bicycling Master Plans (Netherlands Ministry of Transport, 1999; Danish Ministry of Transport, 2000; German Federal Ministry of Transport, 2002). Each of these plans sets forth the overall goal of raising levels of cycling for daily travel while improving cycling safety. They also propose various strategies to achieve these dual goals: better design of lanes, paths and intersections; more and better bike parking; coordination with public transport; and cycling safety

and promotion campaigns. Although the Master Plans vary from one country to another, they generally focus on the federal government's role in fostering research, dissemination of best practice information, and funding and evaluation of a wide range of experimental, innovative projects.

Federal governments usually bear the cost of bicycling facilities built along national highways and contribute significantly to financing long-distance bicycling routes that cross state boundaries (European Conference of Ministers of Transport, 2004). In Germany, for example, the federal government contributed over €1.1 billion to doubling the extent of bikeways along federal highways from 1980 to 2000, and is now devoting €100 million per year for further bikeway extensions, cycling research and demonstration projects. In addition, about €2 billion a year in revenues from the motor fuel tax are earmarked for a special urban transport investment fund, which provides 70–85% federal matching funds for state and local governments wanting to build cycling facilities (paths, lanes, bridges, traffic signals, signs, parking, etc.). From 1990 to 2006, the Dutch Central Government contributed an average of €60 million per year to various cycling projects, including €25 million per year specifically for bike parking at train stations. In addition, the Dutch Central Government provides €1.8 billion a year for provinces to spend on transport projects, including cycling facilities. By comparison, the Danish Central Government has no regular funding for cycling projects but since 2000 has contributed about €2 million a year to various demonstration projects.

The EU has been playing a modest but increasing role in promoting cycling (European Conference of Ministry of Transport, 2004). Its Interreg programme, for example, helps finance transnational and cross-border bikeway projects. That EU funding fits in nicely with the European Cyclists' Federation's (ECF) VeloEuro programme to expand and integrate long-distance bicycling routes throughout Europe. The EU contributes towards the funding of missing bike route connections between countries and of cycling facilities in underdeveloped regions. The EU also facilitates bicycling research and the exchange of best practice information among EU countries, just as national governments do this within each country.

How to Make Cycling Safe and Convenient

Many policies and programmes are necessary to make cycling safe and feasible for a broad spectrum of the population. Table 1 summarizes seven categories of measures that have been widely adopted in Dutch, Danish and German cities. Their success in making cycling so appealing is largely attributable to the coordinated implementation of all of these measures, so that they reinforce the impact of each other in promoting cycling. Indeed, that is perhaps the key lesson to be learned: the necessity of a coordinated, multi-faceted approach.

Due to space limitations, we can only provide a few details to describe the nature and extent of the seven types of measures. The following discussion serves mainly to provide some representative examples of what Dutch, Danish and German cities have been doing to raise cycling levels and make it safer. Most of the information cited below was provided directly to the authors by bicycling coordinators and planners in the ministries of transport of the Netherlands, Denmark and Germany and in two case study cities in each country (Amsterdam and Groningen; Copenhagen and Odense; Berlin and Muenster).

Figure 13. Separate cycling facilities in Odense are so safe and convenient that they attract men and women, young and old. Raised kerbs separate the bike path from the car lane on one side and from the footpath on the other side.
Source: Troels Andersen, City of Odense

Bike Paths and Lanes

Especially from the mid-1970s to the mid-1990s, separate facilities such as bike paths and lanes expanded greatly in all the three countries. In Germany, the bikeway network more than doubled in length, from 12 911 km in 1976 to 31 236 km in 1996 (German Federal Ministry of Transport, 1998). In the Netherlands, the bikeway network doubled in length, from 9282 km in 1978 to 18 948 km in 1996 (Statistics Netherlands, 1999; Pucher and Dijkstra, 2000). National, aggregate statistics for the period since the mid-1990s are not available, but data for individual cities suggest continued expansion, albeit at a much slower rate than previously. The main focus now appears to be on improving the specific design of cycle paths and lanes to improve safety.

In 2004, for example, Berlin (3.4 million inhabitants) had 860 km of completely separate bike paths, 60 km of bike lanes on streets, 50 km of bike lanes on sidewalks, 100 km of mixed-use pedestrian-bike paths and 70 km of combined bus-bike lanes on streets (City of Berlin, 2007). Amsterdam (735 000 inhabitants) and Copenhagen (504 000 inhabitants) each have roughly 400 km of completely separate bike paths and lanes (City of Amsterdam, 2003a; City of Copenhagen, 2004). Even much smaller cities, however, have extensive cycling facilities. For example, there are 320 km of bike paths and lanes in Muenster, Germany (278 000 inhabitants), over 500 km in Odense, Denmark (185 000 inhabitants), and over 420 km in Groningen, the Netherlands (181 000) (City of Muenster, 2004; Dutch Bicycling Council, 2006; City of Odense, 2007).

Table 1. Key policies and innovative measures used in Dutch, Danish and German cities to promote safe and convenient cycling

Extensive systems of separate cycling facilities
- Well-maintained, fully integrated paths, lanes and special bicycle streets in cities and surrounding regions
- Fully coordinated system of colour-coded directional signs for bicyclists
- Off-street short-cuts, such as mid-block connections and passages through dead-ends for cars

Intersection modifications and priority traffic signals
- Advance green lights for cyclists at most intersections
- Advanced cyclist waiting positions (ahead of cars) fed by special bike lanes facilitate safer and quicker crossings and turns
- Cyclist short-cuts to make right-hand turns before intersections and exemption from red traffic signals at T-intersections, thus increasing cyclist speed and safety
- Bike paths turn into brightly coloured bike lanes when crossing intersections
- Traffic signals are synchronized at cyclist speeds assuring consecutive green lights for cyclists (green wave)
- Bollards with flashing lights along bike routes signal cyclists the right speed to reach the next intersection at a green light

Traffic calming
- Traffic calming of all residential neighbourhoods via speed limit (30 km/hr) and physical infrastructure deterrents for cars
- Bicycle streets, narrow roads where bikes have absolute priority over cars
- 'Home Zones' with 7 km/hr speed limit, where cars must yield to pedestrians and cyclists using the road

Bike parking
- Large supply of good bike parking throughout the city
- Improved lighting and security of bike parking facilities often featuring guards, video-surveillance and priority parking for women

Coordination with public transport
- Extensive bike parking at all metro, suburban and regional train stations
- 'Call a Bike' programmes: bikes can be rented by cell phone at transit stops, paid for by the minute and left at any busy intersection in the city
- Bike rentals at most train stations
- Deluxe bike parking garages at some train stations, with video-surveillance, special lighting, music, repair services and bike rentals

Traffic education and training
- Comprehensive cycling training courses for virtually all school children with test by traffic police
- Special cycling training test tracks for children
- Stringent training of motorists to respect pedestrians and cyclists and avoid hitting them

Traffic laws
- Special legal protection for children and elderly cyclists
- Motorists assumed by law to be responsible for almost all crashes with cyclists
- Strict enforcement of cyclist rights by police and courts

Source: Information provided directly to authors by bicycling coordinators in the Netherlands, Denmark and Germany

The bicycling networks in all these cities include numerous off-street short-cut connections for cyclists between streets and traversing city blocks to enable them to take the most direct possible route from origin to destination. The result of such a wide range of facilities is a complete, integrated system of bicycling routes that permit cyclists to cover almost any trip either on completely separate paths and lanes or on lightly travelled, traffic-calmed residential streets.

Not only has the network of separate cycling facilities greatly expanded since the 1970s, but also their design, quality and maintenance have continually

improved to ensure safer, more convenient and more attractive cycling with each passing year. In addition, many cities in the Netherlands, Denmark and Germany have established a fully integrated system of directional signs for cyclists, colour-coded to correspond to different types of bike routes. That system of signage often extends to entire regions, states and even countries for long-distance routes (City of Copenhagen, 2002; Andersen, 2005; City of Muenster, 2007).

All large cities and most medium-sized cities in the Netherlands, Denmark and Germany provide detailed maps of their cycling facilities. Some cities have recently introduced Internet bike route planning to assist cyclists in choosing the route that best serves their needs. In Berlin and Odense, for example, cyclists can enter their origin and destination as well as a range of personal preferences, such as speed, on-street or off-street facility, avoiding intersections and heavy traffic, etc. (Andersen, 2005; City of Berlin, 2007). The Internet programme shows the optimal route on a map and provides all relevant information about time, average speed, bike parking and public transport connections. This bike route planning is even possible while en route, using the LCD display of a mobile phone.

The provision of separate cycling facilities is undoubtedly the cornerstone of Dutch, Danish and German policies to make cycling safe and attractive. They are designed to feel safe, comfortable and convenient for both young and old, for women as well as men, and for all levels of cycling ability. Separate facilities are not sufficient but they are certainly necessary to ensure that cycling is possible for a broad spectrum of the population (Garrard *et al.*, 2008).

Figure 14. This traffic-calmed street in Freiburg, Germany restricts car speeds to 30km/hr and gives cyclists and pedestrians priority over motorists. Most residential streets in German cities are traffic calmed, thus making them ideal for cycling, even without any special facilities such as lanes or paths. *Source:* John Pucher

Traffic Calming

It is neither possible nor necessary to provide separate bike paths and lanes on lightly travelled residential streets, but they constitute an important part of the overall cycling route network. Thus, Dutch, Danish and German cities have traffic-calmed most streets in residential neighbourhoods, reducing the legal speed limit to 30 km/hr (19 mph) and often prohibiting any through traffic. In addition, many cities—especially in the Netherlands—introduced considerable alterations to the streets themselves, such as road narrowing, raised intersections and crosswalks, traffic circles, extra curves and zigzag routes, speed humps and artificial dead-ends created by mid-block street closures. Cycling is almost always allowed in both directions on all such traffic-calmed streets, even when they are restricted to one-way travel for cars. That further enhances the flexibility of bike travel (Boehme, 2005; City of Berlin, 2007; City of Groningen, 2007; City of Odense, 2007).

The most advanced form of traffic calming—the 'woonerf' or 'Home Zone'—imposes even more restrictions, requiring cars to travel at walking speed. Pedestrians, cyclists and playing children have as much right to use such residential streets as motor vehicles; indeed, motor vehicles are required to yield to non-motorized users.

In the Netherlands, Denmark and Germany, traffic calming is usually area-wide and not for isolated streets. That ensures that thru-traffic gets displaced to arterial roads designed to handle it and not simply shifted from one residential street to another.

Related to traffic calming, almost every city has created extensive car-free zones in their centres, mainly intended for pedestrian use but generally permitting cycling during off-peak hours (City of Copenhagen, 2002; City of Amsterdam, 2003b; City of Muenster, 2004). In some Dutch cities, these car-free zones specifically include cycling facilities such as bike lanes and parking (Dutch Bicycling Council, 2006). The combination of traffic calming of residential streets and prohibition of cars in city centres makes it virtually impossible in some cities for cars to traverse the city centre to get to the other side. Cars are forced to take various circumferential routes instead, thus mitigating the congestion, pollution and safety problems they would cause in dense city centres.

Another kind of traffic calming is the so-called 'bicycle street', which has been increasingly adopted in Dutch and German cities. These are narrow streets where cyclists are given absolute traffic priority over the entire width of the street. On normal streets, cyclists are usually expected to keep as far to the kerb (or lane of parked cars) as possible, so as not to interfere with motor vehicle traffic. On bicycling streets, however, cyclists can ride anywhere they want, even if that means obstructing cars. Cars are usually permitted to use the streets as well, but they are limited to 30 km/hr (or less) and must yield to cyclists and give special consideration to avoid endangering them. In Muenster, for example, there were already 12 bicycling streets in 2007, and they have been so successful that the city has plans to add another 10 bicycling streets in the coming years (City of Muenster, 2007).

Traffic calmed residential neighbourhoods, car-free city centres, and special bicycle streets all greatly enhance the overall bicycling network in Dutch, Danish and German cities. Most importantly, they offer much safer, less stressful cycling than streets filled with fast-moving motor vehicles. Since most bike trips start at home, traffic calming of neighbourhood streets is crucial to enabling bike trips to

Figure 15. This contra-flow lane in Copenhagen enables cyclists to ride in both directions, while cars are restricted to one direction. The roadway has been deliberately narrowed through the provision of bike parking. In effect, these modifications have turned it into a bicycling street, where cyclists outnumber motorists.
Source: Jennifer Dill

start off in a safe, pleasant environment on the way to the separate bike paths and lanes that serve the rest of the trip.

The available empirical evidence shows that traffic calming improves overall traffic safety. The benefits tend to be greatest for pedestrians, but serious cyclist injuries also fall sharply. Moreover, most studies report large increases in overall levels of walking and cycling. There are, of course, many different kinds of traffic calming. It is conceivable that one or another specific kind of traffic calming measure (perhaps roundabouts or speed humps) might detract from cycling safety in some circumstances. Overall, however, the evidence is overwhelming that traffic calming enhances both pedestrian and cyclist safety by reducing speeds on secondary roads (Herrstedt, 1992; Webster and Mackie, 1996; Transport for London, 2003; Morrison *et al.*, 2004).

Intersection Modifications

While bike paths and lanes help protect cyclists from exposure to traffic dangers between intersections, they can pose safety problems when crossing intersections. Thus, Dutch, Danish and German planners have worked continuously on perfecting the designs of intersections to facilitate safe cyclist crossings (City of Copenhagen, 2002; City of Berlin, 2003; Dutch Bicycling Council, 2006). The extent and specific design of intersection modifications vary, of course, from city to city, but they generally include many of the following:

Figure 16. Green wave for cyclists in Odense, Denmark. Bright green lights on the bollards along the path pulsate in a wave-like forward motion guiding cyclists to the next green traffic signal at 20km/hr. If cyclists keep pace with the green wave, they get green traffic signals at all intersections.
Source: Troels Andersen, City of Odense

- special bike lanes leading up to the intersection, with advance stop lines for cyclists, far ahead of waiting cars;
- advance green traffic signals for cyclists, and extra green signal phases for cyclists at intersections with heavy cycling volumes;
- turn restrictions for cars, while all turns allowed for cyclists;
- highly visible, distinctively coloured bike lane crossings at intersections;
- special cyclist-activated traffic lights;
- timing traffic lights to provide a 'green wave' for cyclists instead of for cars, generally assuming 14–22 km/hr bike speed, depending on type of route;
- insertion of traffic islands and bollards in roadway to sharpen turning radius of cars and thus force them to slow down when turning right; and
- realigning bike pathways a bit further away from their parallel streets when they approach intersections to help avoid collisions with right-turning cars.

Given the very nature of roadway intersections, it is virtually impossible to avoid all conflicts between motor vehicles and cyclists, but Dutch, Danish and German planners have done a superb job of minimizing these dangers.

Bike Parking

Extensive bike parking of various sorts is available throughout most Dutch, Danish and German cities. Local governments and public transport systems themselves directly provide a large number of bike parking facilities. Moreover, private developers and building owners are required by local ordinances to

Figure 17. This bike path in Amsterdam swerves to the right several meters to increase cyclist safety when crossing the intersection. The increased distance between the main road and the bike path crossing gives motorists and cyclists more time to see each other and thus avoid collisions. The traffic island with two bollards forces a sharp turning radius for right-turning cars, forcing them to slow down. Cyclists get an advance green light via the two sets of traffic signals shown on the post to the far right, further increasing their speed and safety.
Source: Lewis Dijkstra

provide specified minimum levels of bike parking both within and adjacent to their buildings (City of Berlin, 2005; Dutch Bicycling Council, 2006).

Aside from the large number of bike racks throughout these cities, the most visible and most innovative aspect of bike parking policy is the provision of state-of-the-art parking facilities at train stations. Immediately adjacent to Muenster's main train station, for example, there is a modern, attractive 'bike station' (built in 1999) that offers secure, indoor parking for 3300 bikes as well as bicycle sales, repairs, washing, and cycling touring services. The station has direct access to all train platforms (Boehme, 2005). Amsterdam, Groningen and Odense offer similar, high-capacity bike parking facilities at their main train stations (Langenberg, 2000; City of Groningen, 2007; City of Odense, 2007). Moreover, virtually every train station throughout Dutch, Danish and German metropolitan areas offers bike parking of some sort. In the Berlin region, there were 24 600 bike-and-ride parking spots at train stations in 2005 (including metro, suburban rail and regional rail), with 7000 additional bike parking spots planned by 2010 (City of Berlin, 2007).

Many city centres also offer special bike parking facilities. The City of Odense, for example, recently added 400 sheltered bike racks near its main shopping area as well as a state-of-the-art automatic, secure parking station (Andersen, 2005). Groningen offers 36 major bike parking facilities in its town centre, including seven that are guarded to prevent bike theft (Dutch Bicycling Council, 2006). Amsterdam has 15 guarded bike parking facilities in its downtown shopping area (City of

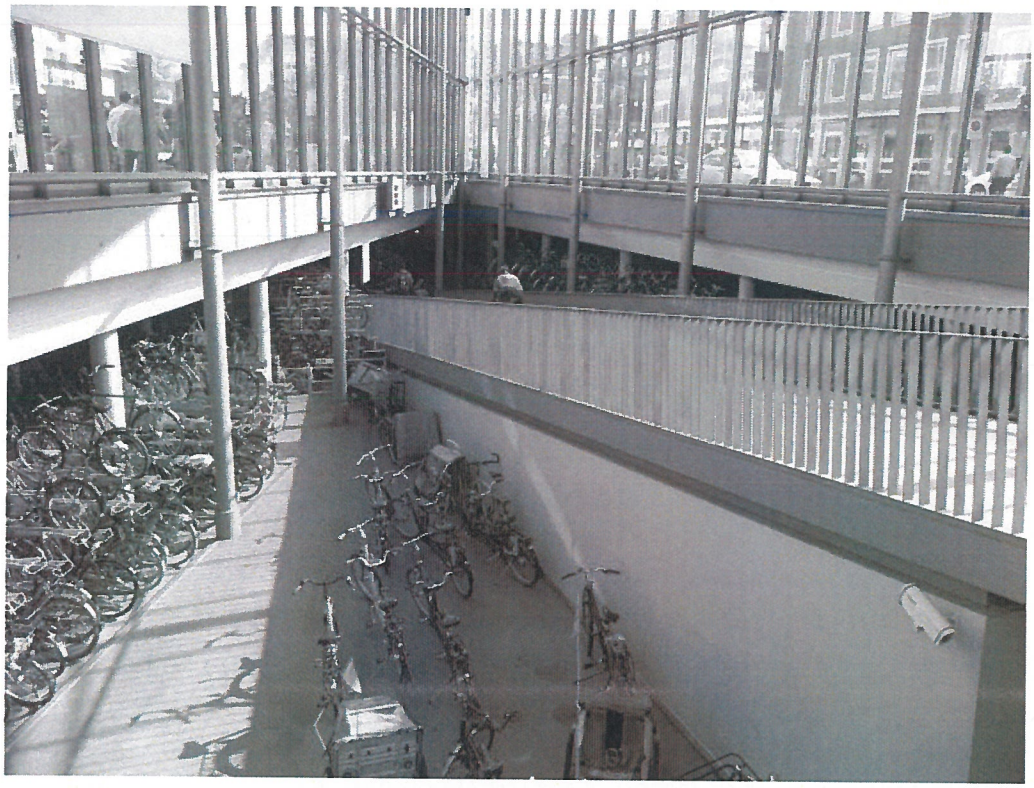


Figure 18. Deluxe parking for 3,300 bikes at the main train station and bus terminal in Muenster, Germany. The bike ramp connects the street level to the bike parking level, from which there is direct access for cyclists to all train platforms. All bus stops are at ground level just to the left of the bike station.
Source: Peter Berkeley

Amsterdam, 2007). In 2007, Muenster added a secured, indoor parking facility for 290 bikes adjacent to its main shopping district (City of Muenster, 2007). The City of Copenhagen installed 3300 bike parking spaces in the town centre to facilitate cycling for shopping and entertainment trips (City of Copenhagen, 2007).

Clearly, the provision of convenient, secure, sheltered bike parking is essential to cyclists, just as car drivers need parking for their cars. The current policy focus in Dutch, Danish and German cities is to increase the security of bike parking, since bike theft is a major problem.

The random parking of bikes in public spaces can obstruct pedestrians on sidewalks and is considered by some to be a visual eyesore. Thus, the supply of bike parking is being expanded not only for greater cyclist convenience but also to deal with the clutter of randomly parked bikes. Somewhat similar to car parking in the USA, there never seems to be enough bike parking. In spite of Muenster's superb bike parking facility at the main train station, for example, there are still over 10 000 bikes parked in the nearby sidewalks, plazas and alleys, and most of those are not in racks (City of Muenster, 2004).

Integration with Public Transport

Most Dutch, Danish and German cities have integrated cycling with public transport. Public transport companies and city planners in northern Europe have

increasingly recognized the key role that bicycling plays as a feeder and distributor service for public transport. Thus, copious bike parking is provided at train stations in the city centre as well as at outlying stations along the rail network (North-Rhine Westphalia Ministry of Transport, 2004). In cities such as Muenster, many suburban residents use a bike to reach the nearest suburban rail station, park it there, and then take the train to the city centre, where they continue their trip with another bike they have parked at the main train station (City of Muenster, 2004). Most rail systems charge an additional fee for cyclists to take their bikes on suburban trains, metros and trams. Moreover, many systems prohibit bikes on vehicles during rush hours, and even if permitted, it can sometimes be less convenient than keeping bikes at parking facilities at both ends of the trip.

Most Dutch, Danish and German cities we surveyed do not permit bikes to be taken onboard regular city buses, and most buses do not come equipped with bike racks (City of Amsterdam, 2007). That contrasts starkly with the USA, where over 50 000 urban transit buses in 2007 had bike racks to facilitate bike and ride (American Public Transportation Association, 2007). It appears to be the one area where American transit systems do a better job of coordinating cycling with transit. The northern European approach is to provide bike parking facilities at major bus terminals, bus route interchanges and even some suburban bus stops. Bike-and-ride facilities at bus stops are not nearly as extensive, secure and comfortable as those at rail stations, but they help offset the lack of bike racks on buses.

Another form of bike-transit integration is the provision of bike rentals at virtually every major Dutch, Danish and German train station and many suburban stations as well. The German Railways' 'Call a Bike' programme in Berlin is especially innovative. It permits anyone with a mobile phone and credit card to rent one of more than 3000 German Rail bikes placed all over the city. One simply calls up the 'Call a Bike' number, provides credit card information (charged per minute of bike use), and then receives the access code used to unlock the bike (German Railways, 2007). The bike can be left at many different locations throughout the city instead of being returned to the point of origin. The same 'Call a Bike' service is offered by German Railways in other major cities such as Hamburg, Cologne, Frankfurt and Munich, with a total of over 10 000 such rental bikes.

There is an even more extensive public transport bike programme in the Netherlands. In 2007, over a hundred Dutch railway stations provided quick and easy discount bike rentals, operated by OV-Fiets. Payment is made via a special account linked to a season ticket for public transport or a special OV-Fiets membership card (OV-Fiets, 2007).

Training and Education

Dutch, Danish and German children receive extensive training in safe and effective cycling techniques as part of their regular school curriculum. Most children complete such a course by the fourth grade. It includes both classroom instruction and 'on the road' lessons, first on a cycling training track just for children and then on regular cycling facilities throughout the city. Real police officers test the children, who receive official certificates, pennants and stickers for their bikes if they pass the test. Since many children get to school by bike, training in safe cycling is considered essential to ensure their safety (German Federal Ministry of Transport, 2002). But it also gets kids off to a lifetime of safe cycling skills. And since all schoolchildren are included, it means that girls as well as boys start cycling at an early age.

Another crucial element in cyclist safety is training motorists to be aware of cyclists on the roadway and to avoid endangering them. In general, motorist training in the Netherlands, Denmark and Germany is far more extensive, more thorough, and more expensive than in the USA. Motorists are legally responsible for collisions with children and elderly cyclists, even if they are jaywalking, cycling in the wrong direction, ignoring traffic signals, or otherwise behaving contrary to traffic regulations (German Federal Ministry of Transport, 2002; Netherlands Ministry of Transport, 2006). The priority legal status of non-motorists puts motorists on the defensive and forces them to drive with special attention to avoiding endangering cyclists and pedestrians.

Traffic Laws

As suggested by the previous section, traffic laws in the Netherlands, Denmark and Germany give special consideration to the especially vulnerable situation of cyclists vis-à-vis motor vehicles (German Federal Ministry of Transport, 2006). Thus, they generally require the motorist to make special efforts to anticipate potentially dangerous situations and pro-actively avoid hitting cyclists. Moreover, motorists are generally assumed to be legally responsible for most collisions with cyclists unless it can be proven that the cyclist deliberately caused the crash. Having the right of way by law does not excuse motorists from hitting cyclists, especially children and elderly cyclists.

For the most part, traffic laws intended to protect cyclists and pedestrians from motor vehicles are far more strictly enforced by the police and courts in the Netherlands, Denmark and Germany than in the USA. Moreover, cyclists disobeying traffic laws are also more likely to be ticketed than in the USA. In combination with comprehensive and rigorous training of motorists and cyclists, the strict enforcement of traffic laws surely contributes to safer driving behaviour by motorists and safer cycling by cyclists.

Promotional Events

Although the provision of safe and convenient cycling facilities is the key approach to promoting cycling, virtually all Dutch, Danish and German cities have various programmes to stimulate interest and enthusiasm for cycling by all groups. Table 2 includes a partial listing of typical promotional measures used by six cities we specifically surveyed: Amsterdam and Groningen (Netherlands), Copenhagen and Odense (Denmark), and Berlin and Muenster (Germany). There were many other creative and interesting programmes as well, but Table 2 conveys the sorts of promotional measures undertaken.

Promotional activities tend to be more extensive in Denmark and Germany than in the Netherlands, where cycling levels are already so high that the focus is more on safer cycling than on more cycling, although the two are directly related, as noted earlier.

Complementary Taxation, Parking and Land-Use Policies

Most of the above policies refer to measures that make cycling safer and more convenient. Many other important government policies encourage cycling indirectly. Several different categories of such complementary policies are listed in Table 3.

Table 2. Cycling promotion in the Netherlands, Denmark and Germany

Access to bikes
- Free use of distinctive, simple City Bikes parked throughout the city, as in Copenhagen
- Easy, convenient and inexpensive bike rentals at train stations and throughout the city, such as the 'OV-Fiets' and 'Call a Bike' programmes in the Netherlands and Germany, respectively
- Company bikes loaned for free to employees who can use them during the day for short business trips
- Tax breaks to purchase a bike in the Netherlands
- Convenient air pumps for bikes in city centre
- 'Park and Bike': discount bike rentals for motorists who park their cars and bike for the rest of the journey

Bike trip planning
- Bicycling websites with extensive information for cyclists on bicycling routes, activities, special programmes, health benefits of cycling, bikes and bike accessories, etc.
- Flexible Internet bike trip planning tool allows finding the most comfortable or quickest route by bike tailored to the specific preferences and needs of each person
- Comprehensive bike maps for most cities as well as most regions and states

Public awareness campaigns
- Focus on health benefits of cycling, such as the 'Get Rid of the Sack' programme in Odense targeted at overweight middle-aged men with pot-bellies who need more exercise
- Special fun programmes for young children, such as the 'Cycling Duckie' in Odense, which distributes candy, balloons, free bike accessories and other gifts to children learning to cycle
- Cycling ambassador programmes that send well-trained cyclists to residential neighbourhoods to serve as role models of safe cycling and help with cycling promotion, distributing newsletters and information
- Annual bicycling festivals and car-free days that promote the environmental advantages of bicycling, display the latest bike models and accessories, and disseminate various other relevant information for bike enthusiasts
- Wide range of cycling competitions for different ages and skill levels
- Special guided bike tours for seniors

Public participation in bike planning
- Regular surveys of cyclists to assess their satisfaction with cycling facilities and programmes and to gather specific suggestions for improvement
- Bike councils that provide a platform for opinion exchange among stakeholders from businesses, the bike industry, the city administration, research institutes, universities, bike experts and citizen advocacy groups, such as the 'Fahrrat' in Berlin

Source: Information provided directly to authors by bicycling coordinators in the Netherlands, Denmark and Germany

For example, many Dutch, Danish and German cities impose a range of restrictions on car use, including limits on speeds, turns, direction of travel, and in some cases prohibit car use altogether, such as in car-free zones. Similarly, the provision of road capacity and parking facilities is far less generous than in American cities (Newman and Kenworthy, 1999; Transportation Research Board, 2001). Indeed, roadway and parking supply have been deliberately reduced in many Dutch, Danish and German cities over the past few decades in order to discourage car use in the city centre (Dutch Bicycling Council, 2006). The many restrictions on car use and parking reduce the relative speed, convenience and flexibility of car travel compared to cycling (Rietveld and Daniel, 2004).

Moreover, sales taxes on petrol and new car purchases, import tariffs, registration fees, license fees, driver training fees and parking fees are generally much higher in Europe than in the USA (Pucher, 1995; Nivola, 1999; Transportation Research Board, 2001; European Union, 2006). That results in overall costs of car ownership and use two to three times higher in Europe. That higher cost discourages car use

Table 3. Taxation, parking and land-use policies that encourage cycling indirectly

Automobile speed limitations in cities
- Traffic calming of residential neighbourhoods limits cars to speeds of 30 km/hr or less
- 'Home Zones' in many neighbourhoods give cyclists and pedestrians equal rights to road use and limit cars to *walking speed* (about 7 km/hr)
- Car-free zones, one-way streets and artificial dead-ends make car travel through the city centre slow and inconvenient
- Turn restrictions for cars but not for cyclists
- Almost no limited access highways (motorways) in city centres
- Strictly enforced speed limits and traffic rules in cities (such as police cameras at intersections)
- Frequent random speed limit enforcement checks by the police
- Advance stop lines and traffic signal priority for cyclists

Road and parking capacity limitations
- Limited number of car parking places in city centres
- Parking management schemes limit easy car access to urban neighbourhoods, often with resident-only parking or strict time limits
- Replacing car parking facilities with bike parking instead
- Combined bus-bike lanes that permit bike use but prohibit car use
- Deliberately narrowed roads in city centres force cars to drive slowly
- Special bicycle streets that sharply limit car speeds and give cyclists priority in roadway use over the entire width of the road

Taxation of automobile ownership and use
- High taxes and fees on car purchase, ownership and use
- Especially high excise and sales taxes on petrol
- High hourly parking rates in city centre, even in medium-size cities
- High fees and strict training requirements for obtaining a driver's licence (over €1500 in Germany)

Strict land use planning policies
- Most land beyond already built-up areas is off-limits for new development
- Most new development occurs adjacent to already built-up areas, which keeps overall population densities high compared to the USA
- Transport and land-use planning are integrated at several levels of government, with regional coordination that fosters cooperation between adjacent communities
- Many local governments specifically require cycling and walking facilities for new suburban developments, thus reducing the need for car use
- Mixed-use zoning keeps trip distances short and feasible by bicycle and on foot
- Less strict separation of land uses than in the USA, thus enabling natural development of mixed-use neighbourhoods

Sources: Pucher (1995); Nivola (1999); Bratzel (1999); Alterman (2001); Transportation Research Board (2001); Pucher and Dijkstra (2003); European Conference of the Ministers of Transport (2004); Banister (2005); Dutch Bicycling Council (2006); Netherlands Ministry of Transport (2006); Schmidt and Buehler (2007)

to some extent and thus promotes alternative ways of getting around, including cycling, which is surely one of the cheapest of transport modes.

Finally, land-use and urban-design policies in Dutch, Danish and German cities are generally much stricter than in the USA and provide more government controls on low-density sprawl and the long-trip distances that usually generates (Nivola, 1999; Alterman, 2001; Transportation Research Board, 2001; Schmidt and Buehler, 2007). Moreover, mixed-use zoning and transit-oriented developments have a long history in Europe. They facilitate the proximity of residential areas to commercial establishments, schools, churches and a range of services. The resulting trip distances are shorter and thus more bikeable than those in the USA.

For the most part, these complementary taxation, parking and land-use policies are not specifically intended to promote cycling. Nevertheless, they provide dramatically more favourable pre-conditions for cycling than in the USA.

The situation in the UK appears to be far less favourable to cycling than in the Netherlands, Denmark and Germany (Goodwin, 1999; McClintock, 2002; Tolley, 2003; Banister, 2005; Banister *et al.*, 2007). Interviews conducted by the authors in 2007 with a wide range of transport specialists throughout the UK suggest that British metropolitan areas have a greater supply of motorways and car parking than is typical of the Netherlands, Denmark and Germany. Car-free city centres are less common in the UK, traffic calming of residential neighbourhoods is far less widespread, speed limits are generally higher, and many firms provide financial incentives to buy cars and drive them to work. Moreover, land-use controls tend to be less strict than in the rest of northern Europe. The lack of good coordination between land-use and transport has resulted in more low-density suburban sprawl, often strewn along the extensive motorway system surrounding many British cities (Banister, 2005). Clearly, none of the above factors is conducive to cycling. Combined with the lesser extent and inferior quality of cycling facilities in most British cities, these unfavourable conditions might help explain why only slightly more than 1% of trips (1.3%) in the UK were made by bike in 2005.

One interesting exception in the UK is the congestion pricing scheme in London since 2003, which has helped increase cycling levels by 30% (Transport for London, 2007a, b). Cycling in London has grown not only due to the restriction of car use but also by the simultaneous provision of expanded and improved cycling facilities.

Conclusions: Policies to Make Cycling Irresistible

The most important approach to making cycling safe and convenient in Dutch, Danish and German cities is the provision of separate cycling facilities along heavily travelled roads and at intersections, combined with extensive traffic calming of residential neighbourhoods. Safe and relatively stress-free cycling routes are especially important for children, the elderly, women and for anyone with special needs due to any sort of disability. Providing such separate facilities to connect practical, utilitarian origins and destinations also promotes cycling for work, school and shopping trips, as opposed to the mainly recreational cycling in the USA, where most separate cycling facilities are along urban parks, rivers and lakes or in rural areas.

As noted in this article, separate facilities are only part of the solution. Dutch, Danish and German cities reinforce the safety, convenience and attractiveness of excellent cycling rights of way with extensive bike parking, integration with public transport, comprehensive traffic education and training of both cyclists and motorists, and a wide range of promotional events intended to generate enthusiasm and wide public support for cycling.

Would such pro-cycling policies as those listed in Tables 1 and 2 be possible in a country like the USA? Some of the same policies are already used, but to a much lesser extent, in many American cities (Pucher *et al.*, 1999). Moreover, there has been considerable expansion of such measures in recent years, with even more expansion planned. Generous federal funding has helped finance 6165 km of bike lanes, 3483 km of multi-use bike-ped paths and 36 195 bike parking racks in the 50 largest U.S. cities (Thunderhead Alliance, 2007). Bike parking at rail stations has

been increasing, and as noted earlier, over 50 000 buses in the USA already come equipped with bike racks to facilitate bike and ride. Moreover, all states now have federally funded Safe Routes to School programmes designed to help children walk or bike to school.

With the highest bike share of work trips (4%) of the 50 largest U.S. cities, Portland, Oregon, probably has the country's most successful bicycling programme (City of Portland, 2007a, b, c). Portland has more than tripled the total annual number of bike trips since 1991. That is partly due to a range of pro-bike measures such as vastly expanding its bikeway network, increasing bike parking and integrating cycling with bus and rail systems. In addition, bicycling in Portland benefits from the country's most famous land-use planning reforms, which have restricted leap-frog suburban sprawl and encouraged compact, mixed-use development conducive to shorter, more bikeable trips. Portland has also reduced the supply of car parking in the city centre while improving public transport services. Very few American cities can boast of such an integrated range of policies to promote cycling.

While Portland has been a model bicycling city, Chicago and New York provide some impressive examples of what can be done to promote cycling even in two megacities which for decades had been extremely hostile to cycling. In the past ten years Chicago has added over 160 km of bike lanes and paths, established a city-wide cycling network, installed 7000 racks for bike parking and equipped over 2000 buses with racks to encourage bike and ride. Moreover, the latest official bicycling plan calls for further expansion to create an 800 km bikeway network (City of Chicago, 2007). New York has added 392 km of bike paths and lanes in the past ten years and plans an additional 900 km of bike paths and lanes in the coming ten years (New York City Department of Transportation, 2007a). From 2001 to 2007, New York installed over 3000 new bike racks. Official city plans call for a network of 2880 km of bike lanes and mixed-use greenway paths by 2030. Cycling levels in both Chicago and New York have increased considerably. Annual cordon counts conducted by the City of New York at a wide range of locations throughout Manhattan indicate that cycling levels more than doubled (116% increase) between 2000 and 2007 (New York City Department of Transportation, 2007b).

In short, such pro-bike 'carrot' policies are indeed possible even in a car-oriented country like the USA. By comparison, there is almost no political support in the USA for adopting and implementing the sorts of car-restrictive 'stick' policies listed in Table 3 that indirectly encourage cycling in the Netherlands, Denmark and Germany. In those three countries, car use is far more expensive and much less convenient than in the USA due to a host of taxes and restrictions on car ownership, use and parking. Moreover, strict land-use policies foster relatively compact, mixed-use developments that generate more bikeable, shorter trips. Promoting cycling is surely not the main purpose of such policies, but they clearly provide important incentives and supportive conditions for cycling.

With very few exceptions, such as Portland, Oregon, neither car-restrictive measures nor stringent land-use controls have yet been politically acceptable in American cities (Pucher *et al.*, 1999; Banister *et al.*, 2007). The public and the media vigorously oppose even slight increases in the petrol tax, for example, and thus discourage politicians from even considering increased taxation on car use. Similarly, there is little support for restrictions on car parking, speeds and passage of cars through city centres and residential neighbourhoods. Thus, there appears to be only very limited potential for implementation in the USA of these crucial 'stick' approaches that would encourage cycling.

Even in a city such as New York, where a majority of residents have no cars, it has been an uphill battle trying to approve the proposed congestion pricing scheme for Manhattan. It would involve a charge of $8 for cars and $21 for trucks to enter Manhattan south of 86th Street on weekdays between 6 am and 6 pm (New York City Department of Transportation, 2007a). Both Mayor Bloomberg (of New York City) and Governor Spitzer (of New York State) strongly support congestion pricing, and the U.S. Department of Transportation has offered $353 million in subsidy to help finance the programme. The plan remains highly controversial, however, and a combined state and city commission has been established to evaluate it. The federal government has set a deadline of 31 March 2008 for final city and state approval of the congestion pricing plan, and a deadline of 31 March 2009 for its implementation. Based on the London experience, it seems likely that congestion pricing in New York would increase cycling levels, especially since the city plans to greatly expand its cycling facilities at the same time.

The key to the success of cycling policies in the Netherlands, Denmark and Germany is the coordinated implementation of the multi-faceted, mutually reinforcing set of policies summarized in Tables 1, 2 and 3. Not only do these countries implement far more of the pro-bike measures, but they greatly reinforce their overall impact with highly restrictive policies that make car use less convenient as well as more expensive. It is precisely that double-barrelled combination of 'carrot' and 'stick' policies that make cycling so irresistible.

Acknowledgements

The authors are deeply indebted to a host of colleagues around the world for their assistance and advice in writing this article. They include national and local cycling coordinators, city planners, transport researchers, national statistical experts, department of transport officials and public health experts, listed here alphabetically: Peter Berkeley, Mia Birk, Stefan Boehme, Frank Borgman, Noah Budnick, Linda Christensen, Andy Clarke, Marie Demers, Lewis Dijkstra, Jennifer Dill, Bernhard Ensink, Bent Flyvbjerg, Per Garder, Jan Garrard, Roger Geller, Martina Guettler, Susan Handy, Peter Herwig, Ria Hilshorst, Peter Jacobsen, Roland Jannermann, Niels Jensen, Cor van der Klaauw, Jutta Kloas, Thomas Krag, Patrick Lingwood, Hugh McClintock, Randy Neufeld, Wolfgang Richter, Piet Rietveld, Harry Rutter, Warren Salomon, Birgit Schmidt, Kristen Steele, Peter Strang, Steve Weber, John Whitelegg, and Bert Zinn. The authors also thank two anonymous referees for their helpful suggestions on improving the original version of the article.

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Bicycles are transportation. They are not toys. They belong on the street, not on the sidewalk. But in order for that to happen, riders must not only feel safe, they must feel comfortable.

People on bikes and people driving cars are all human beings. People. Your friend, your brother, your sister, your mother, your neighbor, your kid's best friend, your CEO, your fry cook, your average person who shares 99.9% of your genome and is exactly the same as you except they happen to be on two wheels instead of four.

Since 1992, bicycle sales in the United States have been between 15-20 million annually. At last month's annual bicycle industry trade show, everybody was showing electric assist bicycles. One source says worldwide sales of electric assist bikes are projected to be upwards of 40 million in 2023. A lot of those will probably be to people who do not ride regular bikes today.

When we build a new subdivision or office park out in a field, we always put in streets for cars. Nobody ever says "Why put in roads in that field, there are no cars there now." But people say that every day about infrastructure for bikes.

A bicycle facility – be it a bike lane, separated path, or anything else, cannot function in isolation. If you put a road out in the middle of a field but don't connect any other roads to it, of course nobody would drive on it. But we do that with bike lanes all the time. They appear out of nowhere, and then disappear again. Nobody is on those bike lanes because you can't get to them safely.

Where there is bike infrastructure in Medford, it is woefully inadequate. The nationally recognized minimum width for a bicycle lane is five feet. That assumes five full feet of useable space. Here in Medford it is not uncommon to see bike lanes that are maybe three feet wide, and part of that is several inches lower in the gutter. The rider must literally ride on the stripe in order to maintain a safe distance from the curb and gutter. Imagine if we did the same thing with motor vehicle travel lanes – who would want to drive on East Main Street if the vehicle travel lane was only six feet wide and dropped off six inches in the outside two feet? A lot of the most recent professional guidelines recommend bike lanes wider than five feet, and physically separated bike facilities where traffic counts and/or speeds exceed local street standards.

Medford put shared use arrows on Central and Riverside. This breaks every rule of transportation infrastructure. Shared use arrows do not go on arterial streets. Period. The National Association of City Transportation Officials says you should only use shared use arrows on "streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority." Those stencils should have never been installed, unless it was the City's desire to have 8-year-old children riding in the middle of the travel lane at 8mph. Would you put your child in that situation? I won't even ride there myself, so I suspect the answer is no.

Yes, there are people who ride bicycles who do not obey the law. Just as there are plenty of drivers who do not obey the law. But we see drivers behave poorly so often we don't even notice it.

One of the reasons some riders do not obey the law is because our transportation system was simply not designed to accommodate anything other than motor vehicles. Bike riders not observing the rules of the road is simply the logical response to a transportation system that excludes them. I'm guilty of that myself.

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A lot of these people, however, are people who for one reason or another cannot drive. Maybe they are homeless, mentally ill, poor, or all three, and their bike is their only form of transportation. Maybe they got a DUI. Whatever the case, I for one am very glad a lot of these people are on a bike instead of driving a barely function car the wrong way down the street.

Maybe they can't afford the massive amount of money it requires to purchase, maintain and insure a car. For some folks, the money they save by not having a car is the money that gives them a roof over their heads instead of a tent on the Greenway.

And yes, some are simply people who only casually follow the rules of the road, which is no different than a lot of drivers. The difference is, when a cyclist does it they only hurt themselves. When drivers do it other people die.

We as a region have made a massive investment in the Bear Creek Greenway. It's a great accomplishment. We should be proud of ourselves for building the best linear homeless shelter in southern Oregon. It sure would be nice if Medford would do something to make it a place women and children felt comfortable walking or riding a bike.

Bicycle infrastructure must be suitable for users of all ages, abilities and experience levels. In fact, I would say that it must be suitable for an 8-year-old kid. Because if it does not work for that little kid, that kid will never learn how to ride a bike, will never know what it is like to have that kind of freedom, and will never become a competent rider as an adult.

You are not designing your bicycle transportation network for people like me. I'm comfortable riding in traffic. I've literally shared the roundabout on Siskiyou and Highland with cars at least five times. I could touch their sideview mirror. In my first two weeks commuting from my home in east Medford I was hit by a mother who pulled into the bike lane and stopped in front of me one morning at Hoover Elementary School. I've been hit or had close calls more times than I care to count. And I still ride. Any single one of these events would likely scare most people from ever riding again.

For two years I commuted by bike 27 miles from Tacoma to the south end of Renton, Washington, 3-5 days a week. Seven glorious miles of that ride were on the InterUrban Trail, with only a few at-grade street crossings. There were some evenings I got home faster on my bike than I did driving. I once rode from Mosier to Pendleton in one day, most of it on I-84. Several years ago, my 70-year old father and I did 500 miles in six days with more than 20,000 feet of climbing, riding from Portland to Eugene, then east through Redmond and Prineville to Mitchell, along the John Day River past Monument and finally through Long Creek to Pendleton. I did it towing a 55-pound trailer with all our camping gear. The first ten or twenty miles riding on Hwy 126 east of Springfield were quite frankly terrifying. But overall that ride was one of the coolest things I've ever done. I got to bond with my father, and at the end of that week I felt like I could take on the world. I wanted to keep going. One of these days I hope to ride across the country.

Why is that even relevant?

That's not the sort of thing you do without a lot of experience under your wheels. You get that experience by starting small, with bike lanes and paths in your local neighborhood where you feel safe. My ability and desire to ride started with a network of separated paths in the town where I

grew up, that made me a confident solo rider well before the age of ten. But more important than that, was the fact that my parents did not constantly worry about my safety as I explored my town on my own.

In this modern age, if we want to become a place that people want to live and raise a family we must be an amenity location. If we want the kids who grow up here to stay here, and we want to attract younger people to our region, we need to be an amenity location. These younger people want a place where they can walk and ride a bike, both for transportation and for fun. And I don't mean just one place like the Greenway. They want to be able to walk and ride a bike to the local pub on Friday and Saturday nights, to work, to the Farmers Market, and to visit friends. (For the record, I'm almost 50, and I do too)

And don't even get me started on bicycle riders not paying for roads. Our roads have been subsidized by property and other taxes since there were roads. People who don't drive are subsidizing those who do. People who ride instead of driving are actually saving you money. Should we charge a tax on shoes to use the sidewalk?

The overwhelming majority of people who ride bikes also own cars and drive them. I have two cars myself, and I drove one of them here. We are not a subset of the population that hates cars and all who drive them. We are simply people who would like a healthy and safe alternative to driving, even if it's only some of the time. If we had it, we would leave our cars at home more often and ride a lot more. By doing so we will improve our physical and mental health, reduce pollution, reduce traffic, reduce our transportation expenses, and possibly most important, have fun. Having fun makes people happy. Sitting in a car in traffic does not.

Riding a bike should not be an option only for those who do not have another option. For those who are physically able, they should be able to get up in the morning and have the option of riding a bicycle instead of driving. Their actual or perceived safety should not be the reason they decide not to ride.

Attached testimony

The first is a description of the Four Type of Transportation Cyclists from the City of Portland Bureau of Transportation. I like to use this mainly to remind people that while I may fall into the "strong and fearless" category myself, (although since my time here in Medford I have to admit I am no longer fearless), the bicycle transportation system is not intended to serve people like me. Its purpose is to serve people who fall into the "Interested but Concerned" group, who would consider riding but don't feel safe enough to try on the existing system.

The second is an October 9 article from Forbes magazine online, regarding a study recently conducted by a British insurance firm that found that drivers who also ride bicycles are better drivers than regular drivers.

The third is an excerpt from the City of Syracuse, New York Bicycle Plan. I use this not because it is an outstanding example, but because it is an average example from a place that is not particularly notable for being on the cutting edge of anything. Their plan was adopted in 2012, which means they were well-aware of the benefits of cycling and realized something had to be done long before then.

One non-bike related item:

Please do not reduce or eliminate the streets going through the Roxy Ann development area, including the upgrades to Spring Street.

If we do not have an adequate network of streets on the east side, all traffic from new development will be forced onto Jackson & McAndrews. This forces an undue burden on the people who live on and use these streets, especially Jackson. (MD-4)

Aside from the traffic impacts generally, Jackson is the only comfortable route for cyclists going between downtown and anywhere east of Foothill / N Phoenix Rd. Barnett & McAndrews are both major arterials & are not alternatives.

Great Places are places for people. First and foremost, places where people can walk safely and comfortably. But also places where people who might live or work a little more than walking distance from their favorite places can ride to them.

A plan that is "adequate" and satisfies statewide Planning Goals will ensure adequate results, not great results, and not a great place.

50.2 **LDP-18-088 / E-18-127** Consideration of a request for tentative plat approval of a proposed two-lot partition on a 1.28 acre parcel located approximately 550 feet southeast of the intersection of Canyon Avenue and Roberts Road within the SFR-4 (Single Family Residential – 2.5 to 4 dwelling units per gross acre) zoning district (371W17DD 700) including Exception requests to the minimum lot density and the maximum lot size. Applicant & Agent, CA Galpin; Planner, Steffen Roennfeldt.

50.3 **CP-16-075 / DCA-18-120** The proposal is a legislative amendment to develop a procedure for preparing and adopting urbanization plans for areas recently brought into the urban growth boundary. The proposed language will amend the Neighborhood Element of the Comprehensive Plan and will outline the process land owners must follow to adopt plans that show land uses, densities, and transportation networks in the new expansion areas. This project is filed in conjunction with DCA-18-120, a development code amendment to revise Chapter 10 of the Municipal Code to incorporate procedural requirements associated with urbanization plans. Applicant: City of Medford; Planner: Carla Paladino, Principal Planner.

50.4 **CP-16-036** A legislative amendment to adopt a revised Transportation System Plan and amend applicable portions of the Comprehensive Plan including the Transportation element and Goals, Policies, and Implementation element. Applicant: City of Medford; Planner: Carla Paladino, Principal Planner.

60. Reports

60.1 Site Plan and Architectural Commission

60.2 Joint Transportation Subcommittee

60.3 Planning Department

70. Messages and Papers from the Chair

80. Remarks from the City Attorney

90. Propositions and Remarks from the Commission

100. Adjournment

Yes on roundabouts!

2 kinds of communities, defined by excitement level

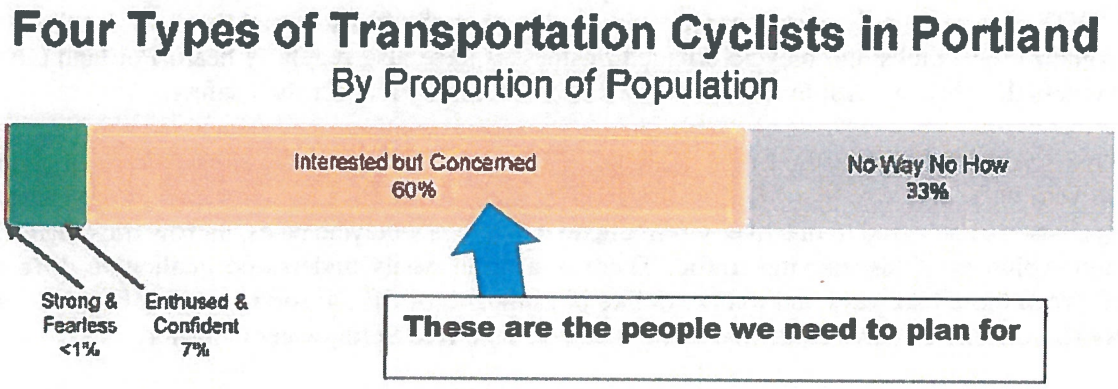
The communities you are excited to arrive in, and those you are excited to leave.

If we ~~the~~ want to be the former, we need to make bike + ped transportation a priority, not an afterthought

Don't just adopt this plan, follow through ~~with~~ [illegible]

Four Types of Transportation Cyclists

Read the Full Report with Details on the Support for the Categories



Despite all the considerable advances Portland and the region have made in facilitating bicycling, concerns about the safety of bicycling still loom large. Riding a bicycle should not require bravery. Yet, all too often, that is the perception among cyclists and non-cyclists alike. No person should have to be "brave" to ride a bicycle; unfortunately, this is a sentiment commonly expressed to those who regularly ride bicycles by those who do not. There are many cities in modern, industrialized nations around the world with a high bicycle mode split. They have achieved these high levels of bicycle use through adherence to various cycling-promoting policies and practices. But, one thing they share in common is they have substantially removed the element of fear associated with bicycling in an urban environment. They have created transportation systems in which bicycling is often the most logical, enjoyable and attainable choice for trips of a certain length for a wide swath—if not the majority—of their populace. For residents of these cities, concern about personal safety associated with bicycling is rarely a consideration, and certainly not to the levels we experience here. In these "fearless" cities septuagenarians are able to ride alongside seven-year-olds safely, comfortably, and with confidence throughout the breadth of the cities[1]. Making bicycling a more widespread and mainstream means of transportation in Portland will require substantially addressing concerns about personal safety.

Describing the four general categories of transportation cyclists in Portland and their differing needs best precedes a discussion of bikeway treatments. For lack of better terminology, Portlanders can be placed into one of the four following groups based on their relationship to bicycle transportation[2]: "The Strong and the Fearless," "The Enthused and the Confident," "The Interested but Concerned." The fourth group are non-riders, called the "No Way No How" group.

Survey after survey and poll after poll has found again and again that the number one reason people do not ride bicycles is because they are afraid to be in the roadway on a bicycle. They are generally not afraid of other cyclists, or pedestrians, or of injuring themselves in a bicycle-only crash. When they say they are "afraid" it is a fear of people driving automobiles. This has been documented and

reported in transportation literature from studies, surveys and conversations across the US, Canada, and Europe.

This expression of fear is also something that has been heard hundreds, if not thousands of times by city staff in conversations with Portland residents. Any staff person involved with bicycle projects from Portland's Office of Transportation, PortlandParks and Recreation, Metro, and ODOT has repeatedly heard expression of this fear. Staff and employees of local bicycle organizations, clubs and bicycle-oriented businesses have also regularly heard Portland citizens express that their interest in riding a bicycle is countered by fear for their safety.

This fear can be understood experientially. There is a qualitative difference between riding a bicycle on a bikeway like SE Lincoln-Harrison—with little traffic, slow speeds, and frequent cyclists--as compared to one like N Willamette with narrow bicycle lanes, narrow travel lanes and high volumes of fast-moving traffic. There is also an easily understood qualitative difference between these bikeways and roadways like N Lombard, or SE Division, or West Burnside, as is there a difference between them and the motor-vehicle-free Springwater Corridor.

There is a continuum of cyclists, and of attitudes about cycling among the citizens of Portland. Some will tolerate West Burnside, others are comfortable on Willamette, more prefer Lincoln-Harrison, and many truly feel at ease only on a trail like the Springwater. Others will not ride anywhere in the City of Portland, or elsewhere. This continuum is defined, in part, by individual comfort level on different types of bikeways.

The "Strong and the Fearless" comprise perhaps 2,000 or fewer cyclists in Portland, representing fewer than 0.5% of the population. These are the people who will ride in Portland regardless of roadway conditions. They are 'bicyclists;' riding is a strong part of their identity and they are generally undeterred by roadway conditions—though likely few are courageous enough to venture too far up West Burnside into the West Hills.

The "Enthused and Confident" are those who have been attracted to cycling in Portland by the significant advances the city has made developing its bikeway network and supporting infrastructure over the past 16 years. They are comfortable sharing the roadway with automotive traffic, but they prefer to do so operating on their own facilities. They are attracted to riding in Portland because there are streets that have been redesigned to make them work well for bicycling. They appreciate bicycle lanes and bicycle boulevards.

This enthused and confident demographic of cyclists are the primary reason why bicycle commuting doubled between 1990 and 2000 (U.S. Census) and why measured bicycle trips on Portland's four main bicycle-friendly bridges across the Willamette River saw more than a 300% increase in daily bicycle trips between the early 1990's and 2006. There are perhaps now more than 22,000 of this group riding their bicycles regularly in the city. An educated guess would be that this 22,000 represents 60% of the 'enthused and confident' demographic of Portland citizens. These are the citizens who are and could be attracted to regular riding by continuing to address the barriers on which Portland has focused for the past 15 years: shorter trip distances, better bicycle facilities, better end-of-trip facilities. This demographic comprises perhaps 40,000 Portland citizens, or 7% of the population.

A much larger demographic, representing the vast majority of Portland's citizens, are the **"interested but concerned."** These residents are curious about bicycling. They are hearing messages from a wide variety of sources about how easy it is to ride a bicycle in Portland, about how bicycling is booming in the city, about "bicycle culture" in Portland, about Portland being a "bicycle-friendly" city, and about the need for people to lead more active lives. They like riding a bicycle, remembering back to their youths, or to the ride they took last summer on the Springwater, or in the BridgePedal, or at Sun River, and they would like to ride more. But, they are afraid to ride. They don't like the cars speeding down their streets. They get nervous thinking about what would happen to them on a bicycle when a driver runs a red light, or guns their cars around them, or passes too closely and too fast. Very few of these people regularly ride bicycles—perhaps 2,000 who will ride through their neighborhoods to the local park or coffee shop, but who will not venture out onto the arterials to the major commercial and employment destinations they frequent. There are probably 300,000 in this group, representing **60% of the city's population**. **They would ride if they felt safer on the roadways—if cars were slower and less frequent, and if there were more quiet streets with few cars and paths without any cars at all.**

Perhaps one-third of the city's population falls into the last category of 'cyclist.' This is the "no way, no how" group that is currently not interested in bicycling at all, for reasons of topography, inability, or simply a complete and utter lack of interest.

The separation between these four broad groups is not generally as clear-cut as described here. There is likely quite a bit of blurring between the "enthused," the "interested," and those not at all interested, but this has proven to be a reasonable way to understand the city's existing and potential cyclists.

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[1] In The Netherlands and Germany, 50% of all trips made by people 75 and older is either by walking or bicycling. In The Netherlands, 25% of all trips made by such septuagenarians are by bicycle.

[2] This typology is for using the bicycle for transportation, only. People in all these groups—especially the "interested but concerned" group—may bicycle for recreation. This categorization addresses only their willingness to use a bicycle as a main means of transportation.

Forbes
9,215 views|Oct 9, 2018,9:32 am

Cyclists Are Better Drivers Than Motorists, Finds Study

Carlton ReidContributor
Transportation
I am Press Gazette's Transport Journalist of the Year, 2018

Cyclists who drive are better behind the steering wheel than motorists, a new analysis has found. The link between cycling and safer motoring was revealed by a UK insurance firm which offers specialist motor insurance policies for cyclists. This analysis correlates with an earlier study which found that cyclist-drivers tend to have faster reaction times than non-cyclists.

Nick Day of Chris Knott Insurance said an analysis of his firm's crash data showed that cyclists make less than half the number of insurance claims as non-cyclists.

13% of the firm's insured drivers make at least one claim per year, found Day, but this fell to 6% for cyclists who were insured on the firm's cyclist-driver policy.

Day believes cyclists tend to be more aware of their surroundings than motorists.

"Cycling trains you to be more alert to the dangers of road use and better able to anticipate hazards," explained Day.

"You're more aware of how you fit into your surroundings, and you'll ride, or drive, accordingly. Physical exercise [also] leads to improved mental agility, making cyclists more responsive drivers."

Because of reduced risks, Chris Knott Insurance's cyclist-driver policy offers lower premiums than policies aimed at the wider market.

This insurance company's commercial decision is also informed by a study published last year in *Accident Analysis & Prevention* which found that motorists who self-identified as cyclists were better able to spot potential road hazards. Study author Vanessa Beanland of Australian National University noted that the "demands of cycling" appears to hone awareness skills.

In a lab setting Beanland and her associates found that cyclist-drivers responded to fresh information more quickly than motorists who did not cycle.

Perhaps unsurprisingly, the cyclist-drivers were significantly faster at detecting the appearance of fellow cyclists.

Cyclists (and motorcyclists) have a wry acronym for the inattention of motorists. "Sorry, mate I didn't see you" – or SMIDSY – is said to be a typical excuse from motorists who have crashed into two-wheelers. For the same phenomenon, UK government incident reporting uses the phrase "looked but failed to see."

Beanland's study concludes that "cycling experience is associated with more efficient attentional processing for road scenes" and she suggests that road safety would be improved for all if more motorists also cycled.

SYRACUSE BICYCLE PLAN

Syracuse

New York

A COMPONENT OF THE SYRACUSE COMPREHENSIVE PLAN

SYRACUSE BICYCLE PLAN 2040

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Principal Planner
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City Hall
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Executive Summary

The ***Syracuse Bicycle Plan 2040*** is a component of ***Syracuse's Comprehensive Plan 2040*** – an update of the ***Comprehensive Plan 2025*** adopted by the Common Council in 2005. This component addresses both the justification for creating a rigorous bicycle network, as well as outlining how the City of Syracuse can expand its current system.

The Syracuse Bicycle Plan is broken out into four main chapters, each address a different guiding principal for the component:

Making the Case
Inform the public about the personal and social benefits engendered with bicycle transportation.

Inventory Measures and Maps
Provide a clear methodology for determining the best corridors for bicycle infrastructure.

Tool Kit
Highlight appropriate bicycle infrastructure options for the City of Syracuse environment.

Neighborhood Recommendations
Propose conceptual designs for corridors and identify which users would be accommodated.

INTRODUCTION

ORIGIN OF THE BICYCLE PLAN

In the 21st Century, bicycling is becoming a more desirable transportation option for many people. Cities across the county have responded with expanded bicycle networks, which in turn have increase bike ridership and lowered accident rates. In Syracuse, bike lanes first began appearing in 2006. Going through various corridors in the City's Eastside, these bike lanes were the result of neighborhood requests to both accommodate existing cyclists and slow down motorized vehicles. Since this time, bike lanes have continued to expand based, on citizen feedback and safety needs.

In 2010, the demand for more bicycle infrastructure remained strong, and the City administration determined a need to create a plan for a cohesive and connected bicycle network, or a blueprint for future growth. This blueprint would ensure that development along targeted corridors would accommodate bicycle users, and that city resources would be deployed most effectively in expanding and maintaining bike infrastructure. It is from this initial vision of an interconnected city-wide bike network that the ***Syracuse Bicycle Plan 2040*** was created.

PLAN ORGANIZATION

During the initial outreach process it became clear that a network plan alone would not suffice. Many people in the City of Syracuse were were unconvinced of the need for any cycling infrastructure. A series of five white papers were developed and incorporated into the Bicycle Plan. Highlighting five areas (both personal and societal) in which bicycling has a positive effect, these papers provide targeted education to interested citizens. These five areas are:

- **Economic.** Cycling as a transit mode has positive effects on the local economy with regard to tourism dollars and also has less impact on a household's monthly transportation budget.
- **Health.** Cycling is a low-impact cardio-vascular activity that can become incorporated into one's daily commuting routine, provides improved air quality and emits no greenhouse gasses.
- **Equity.** Bicycle networks can provide a dignified mode of travel for individuals without the ability to afford a car, and increase mobility for children and the elderly.
- **Safety.** Large-scale bike networks have been shown to reduce the rate of cyclist accidents, and also make streets safer for all people by slowing down the speed of motorized vehicles.

- **Community.** Cities who have embraced a cycling culture have found that a sense of community is instilled in both residents and commuters along bike corridors.

In Chapter One: Making the Case, the statements above are expanded. Each of the five white papers contain images and graphs, and all supporting statements are cited for those who wish to research further.

Chapter Two: Inventory Measures and Maps contains the main body of the Syracuse Bicycle Plan. In this section, the 13 metrics of bicycle appropriateness are listed, along with weighted ranking criteria for each. These metrics are broke into three general areas: Safety, Connectivity, and Design. The safety measures look at factors of speeds, presence of heavy vehicles, and volume of cars. The connectivity measures determine how well an individual corridor fits into the City-wide network. The design measures identify physical conditions of a corridor such as roadway width, topography, and presence of on-street parking.

Many people in Syracuse were also unfamiliar with many of the new options for bicycle infrastructure that were emerging in other parts of the county. Still others had concerns about the uniquely snowy climate of Syracuse and how these infrastructure investments would weather. To that end, Chapter 3: Tool Kit was developed. This chapter catalogues various infrastructure options appropriate for the City of Syracuse. The first section contains recommendations for pathways which are infrastructure treatments along a corridor. The parking section recommends appropriate bike racks and other parking facilities for Syracuse.

Finally, Chapter Four: Neighborhood Recommendations combines the inventory from Chapter Two with the Tool Kit from Chapter Three. This chapter is broken into 8 sections, each conforming to one of the City's TNT (Tomorrow's Neighborhoods Today) planning areas. Each corridor identified in the inventory is discussed in further detail here. A photo simulation is provided, along with targeted user groups, and a brief discussion about why the corridor was chosen and how it fits into the overall network. These recommendations are only intended as a starting point for neighborhood discussion and should not be considered final design decisions.

In this way, what started as a network vision became expanded into a full planning document with multiple goals.

GUIDING PRINCIPLES

The following four principles represent this Plan's vision for a successful bicycle network in the City of Syracuse.

Making the Case
Inform the public about the personal and social benefits engendered with bicycle transportation.

Inventory Measures and Maps
Provide a clear methodology for determining the best corridors for bicycle infrastructure.

Tool Kit
Highlight appropriate bicycle infrastructure options for the City of Syracuse environment.

Neighborhood Recommendations
Propose conceptual designs for corridors, and identify which users would be accommodated.

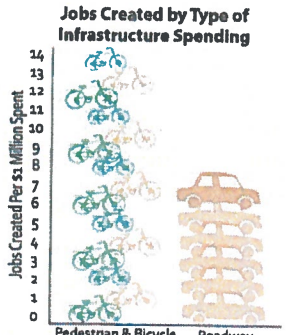
making the case

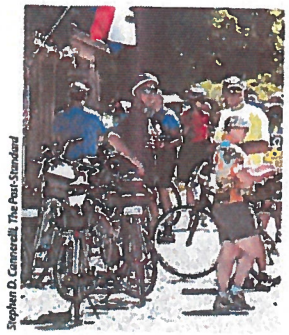
BENEFITS OF A CYCLING CITY

economics
health
equity
safety
community

ECONOMICS

industry, fuel, & efficiency




Stephen D. Cannerelli, The Post-Standard

Erie Canal Tour cyclists in 2009

The bicycle industry in the United States is a powerful economic engine that contributes about **$133 billion per year** to the U.S. economy from jobs to taxes to local businesses[1].

Jobs

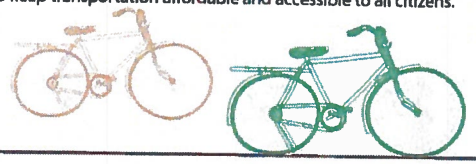
On a local, citywide level, the cycling industry has been shown by many studies to generate economic stimulation through boosting local employment and commercial activity. A recent study in Baltimore, Maryland concluded that pedestrian and bicycle infrastructure projects create nearly twice the number of jobs compared to road infrstructure projects (11 to 14 jobs per $1 million of spending versus 7 jobs per $1 million of spending)[2]. More importantly, nearly half of these employment opportunities are created in industries outside of construction, specifically in the areas of healthcare, retail, and food services. The economic stimulation generated by bike infrastructure extends beyond the initial construction and has a ripple effect on the local economy.

Tourism

Bicycle tourists spend on average $17 more in communities than tourists travelling by other means and dedicate much more time to enjoying local culture, providing incentive to preserve historical attractions such as Syracuse's Erie Canalway trail[1,3]. These tourists' vehicles do not congest traffic or occupy parking spots, and have minimal impact on city infrastructure. By establishing a strong bicycle tourism industry, our city could cultivate a large flow of income with little impact to maintenance costs. Parks and Trails of New York (PTNY) encourages all canalway communities, like Syracuse, to take advantage of the historical attraction and connectivity of our location by providing a thorough bicycle network for tourists to explore.

Energy Independence

The implications of peak oil warrant a critical shift in American transportation policy. Oil is an escalating financial burden to the public as recoverable oil supplies in the U.S. and globally continue to decline. Each day, over $1.22 billion is spent on gasoline in America. It is not only desirable, but necessary to invest in a full range of viable alternatives to oil-dependent mobility if we are to keep transportation affordable and accessible to all citizens.



Infrastructure

Bicycle infrastructure allows for more than five times as many travellers as car lanes. Prioritizing bicycle traffic contributes to decreased fossil fuel demand by both decreasing the number of motor vehicles on the road and limiting the amount of construction and maintenance needed for automobile infrastructure[4].

The monetary benefits of bicycles over automobiles for individuals and society, from energy and congestion reduction to vehicle and infrastructure savings, are estimated to total $2.73 per mile biked[4].

Victoria Transport Policy Institute

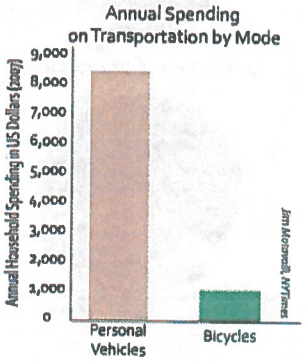
Individual Costs

Owning a bicycle is much less expensive than owning an automobile. When comparing the cumulative costs of purchasing and maintaining a family vehicle to a bicycle, the bicycle will save an average American family of three more than $6,000 per year. In 2009, the average American household spent roughly $8,000 on vehicles and maintenance[5]. During the same year, purchasing and maintaining a bicycle cost, on average, $400 per cyclist. During times of volatile fuel prices, this gap between bicycle and motorized vehicle costs will likely continue to grow.

Ultimately, Syracuse is in an excellent position for an improved bicycle network due to its dense urban grid built predominantly on a human scale, as well as a strong population density near the urban core. Cities show the most potential for a significant return on bike network investments due to existing infrastructure, density of economic interactions, and minimal infrastructure investment required for a potentially maximized user population. By investing in bicycle mobility, Syracuse stands to establish a functioning alternative transportation system prior to potential fuel shortages and escalating prices, placing our city steps closer to a mobile, sustainable future.

Stephen Sorg

Cyclists in lane in NYC



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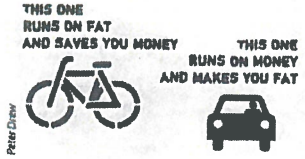
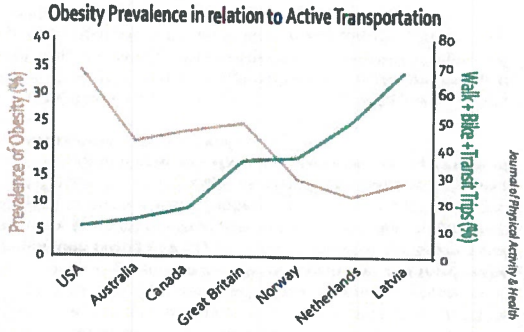
HEALTH

physical & environmental



Peter Drew



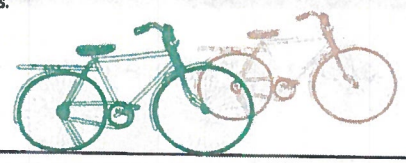
Motor vehicles have made transportation into an inactive activity.

Overcomingobesity.wordpress.com

Personal

In the past two decades, the United States and countries around the world have seen a sharp rise in obesity and associated increases in risk of major health problems such as cardiovascular disease, certain types of cancer, and type-2 diabetes[1]. Compared to Americans at **34% obesity prevalence**, some European countries, such as the Netherlands, have populations with only about 10% defined as obese. With longstanding, extensive, and well-used active transportation systems, Europeans generally walk more than twice and cycle almost five times more annually than the average American, suggesting an inverse relationship. This connection between high levels of active transportation and obesity rankings has been confirmed by studies in the US and Europe[2]. As such, government has an obligation to update transportation infrastructure to include and emphasize access to walking, cycling, and public transit. Active transportation networks address the major determinants of obesity, diet and exercise, with opportunities to:

- increase density of local services,
- provide safe routes to access grocery stores with affordable, fresh food,
- encourage daily physical activity through safe and connected neighborhoods.



Transportation cycling improves health and saves time by making exercise into an enjoyable, outdoor part of your daily routine.

Portland, OR, New York, NY, and now Syracuse are a few examples of US cities addressing obesity and general health issues by investing in urban planning strategies that reduce reliance on automobile transportation and encourage healthy, active lifestyle choices. These strategies include:

- creating recreation facilities and opportunities for more outdoor, active engagement with the environment,
- encouraging private businesses to provide safe bicycle parking and locker rooms to make commuting more convenient and attractive,
- promoting programs that provide health education and resources.

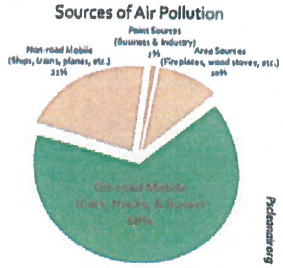
Regional

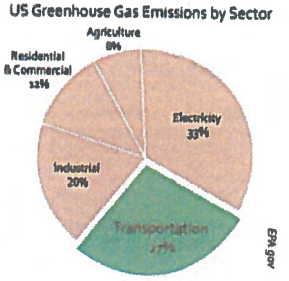
Beyond personal health, shifting from car dominance to bike engagement offers opportunities for improving the health of the city as an ecosystem through **reducing vehicular emissions of harmful chemicals** like sulphur oxides and nitrogen oxides. Syracuse, while no longer a nonattainment area for atmospheric concentrations of carbon monoxide, is nearing the threshold levels for ozone (as designated by the US Environmental Protection Agency). In addition to air quality improvement, a robust bicycle network could reduce the area of impermeable surface needed for roads and parking lots, and consequently, increase the land available for vegetative cover, which:

- further decreases air pollution,
- decreases impacts of polluted run-off and combined sewer overflow,
- decreases the urban heat island effect,
- provides more habitat for native species,
- improves visual character of urban environment.

Global

Beyond regional ecosystem health, cycling produces **no emissions of greenhouse gases**, which are responsible for altering the global climate. Syracuse's contributions to climate change can be drastically reduced by encouraging non-motorized transportation.





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2. Bassett et al. (2008) Walking, cycling, and obesity rates in Europe, North America, and Australia. Journal of Physical Activity & Health. 2008, 5, 795-814. Human Kinetics, Inc.

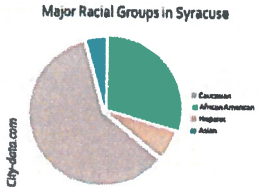
EQUITY

ethnicity, income, gender, & age

"A bikeway is a symbol that shows that a citizen on a $30 bicycle is equally important as a citizen in a $30,000 car."

Enrique Penalosa, former mayor of Bogota, Colombia

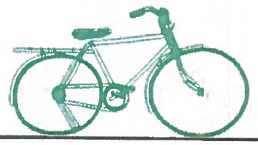
Cyclists enjoying a safe, two-way dedicated bike path in Bogota, Colombia



Ethnicity & Income

The physical health effects mentioned in the previous section are not equally distributed among the population in terms of ethnicity as the incidence of obesity is 51% higher for African-Americans and 21% higher for Hispanics compared to Caucasians[1]. The City of Syracuse is 57.4% Caucasian, 28.3% African-American, and 6.5% Hispanic[2]. Many minority communities in the city are in the low to middle income levels with over **one third of the city's population facing poverty** and limited resources. Limited financial resources due to social disadvantages for education and employment opportunities result in a much higher vulnerability to poor diets and sedentary lifestyles for minority groups. In addition, transportation costs from motor vehicle purchase, fuel, and maintenance can take **up to 40% of expenditures** for lower income families.

With a well-established, accessible bike network connecting underserved neighborhoods to destinations throughout Syracuse, these families would be able to reallocate much of their transportation spending to better food, housing, recreation, and other areas vital to evening the differences in quality of life between households of different income levels.



Gender & Age

Women, children, and the elderly - who comprise the majority of the population and are underrepresented in the cyclist and pedestrian community - are generally interested in joining the active transportation network, but reluctant to regularly walk or bike in areas that feel unsafe and difficult to navigate.

Women only make up **24% of the total cyclist population** in the US. Commonly cited reasons are that women don't want to arrive at destinations sweaty and unkempt and are more wary of dangerous surroundings. However, a recent survey shows that **convenience and infrastructure** are the top two reasons for the low percentage of female cyclists[3]. Females generally have more errands to run. Household duties from dropping kids at school to picking up groceries continue to fall into the hands of women, even with full time employment[4]. Both convenience and infrastructure can be improved directly with bikeway planning.

Children and the elderly are also a vulnerable population. They need access to means of frequent public socialization and recreation, but often are relient on others to transport them for fear of safety and disorientation.

Woman in Los Angeles

Woman and kids in Chicago

Integrating bicycle and pedestrian routes into a continuous and regular multi-modal transportation network can address the need for equity in gender and age active mobility, as well as between income levels.

Children and elderly man cycling in Boulder, Colorado

References

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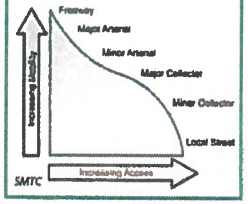
2. City Data. (2010) Syracuse, New York. (http://www.city-data.com/city/Syracuse-New-York.html)
3. Association of Pedestrian & Bicycle Professionals. (2011) Women Cycling Project: What would make you start or increase your cycling?
4. Blue, Elly (2011) Biking's gender gap: It's the economy, stupid (http://www.grist.org/biking/2011-06-20-bicyclings-gender-gap-its-the-economy-stupid)

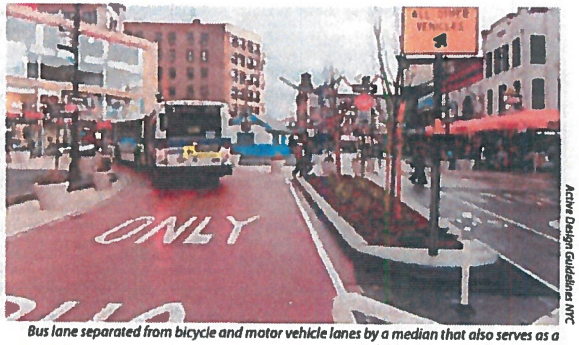
SAFETY

calm traffic & complete streets

Mobility vs. Access

Mobility measures how far you can go and accessibility measures how close you are to where you want to go. Transportation policy that prioritizes personal mobility via automobiles and highways is one of the factors that induced the decline of the urban core and spread of suburban sprawl in Syracuse's surrounding neighborhoods[1]. By reframing transportation planning to fulfill the need for access to resources like schools, community spaces, and local retail stores, we can re-emphasize the importance of dense, mixed use development.



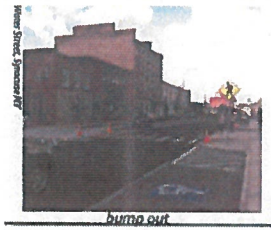


Active Design Guidelines NYC

Bus lane separated from bicycle and motor vehicle lanes by a median that also serves as a pedestrian refuge in New York City

Streets play an integral role in the daily life of our neighborhoods for travel, activities, and socialization. For the past half century, the automobile has been the dominant mode of transportation, demanding wider and straighter roads to accommodate increases in speed and volume of car traffic. This yielding to the automobile has led to the decline of other street uses and activities, like cycling and walking, vital to sustaining safe and interactive communities. Transportation planning for smart growth must shift from promoting mobility to accessibility (see sidebar).

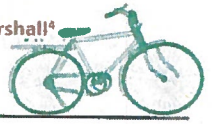
Traffic calming is a road design strategy that creates safer streets and promotes balanced multi-modal mobility by engaging a variety of streetscape changes that slow the speed of motorized traffic. By utilizing bump outs (left) and medians (above) to narrow the width of streets and providing separate or shared travel lanes, streets can safely accommodate a variety of transit modes.

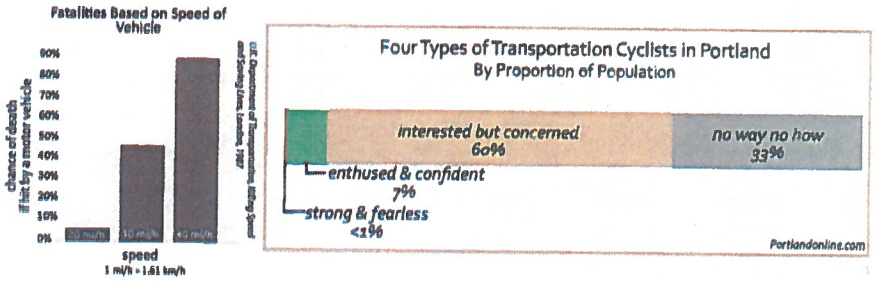


bump out

"Street design strategies that attract bike riders are the same ones that inprove safety for all road users."

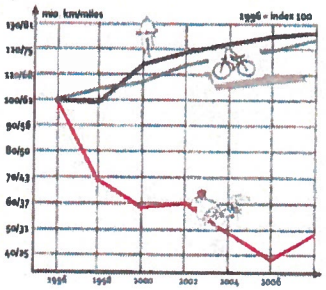
Norman Garrick & Wesley Marshall[4]





Accidents & Attitudes

The level of safety along multi-modal transportation corridors is primarily determined by the speed and volume of car traffic. The frequency and severity of automobile crashes can be reduced by lowering speed limits on roadways. According to a U.K. Department of Transportation study, on average, for every one mile per hour reduction, collisions decrease by 5%; the fatality rate would drop by at least 80% if a 40 mph zone were reduced to a 20 mph zone[2]. **Data shows that cyclists and pedestrians are over-represented in road deaths at almost 14% of fatalities[3].** Even though 12% of all trips taken in America are by bicycle or foot, cyclists and pedestrians are under-represented in road infrastructure spending taking only about 1% of the budget[3]. The death rate of U.S. pedestrians and cyclists is two to six times higher per kilometer traveled than in Europe due to our lack of investment in safe and integrated various transport infrastructures in streetscapes. These accident rates reflect the fear and discomfort felt by 60% of urban citizens, who are interested but concerned about bicycling as their main mode of transport on car-dominated roads. Transportation cycling should be accessible for the whole population, rather than only for the confident and fearless (see bar graphic above). As the number of cyclists on the streets grows with infrastructure, driver awareness and road safety will increase (see graph to the right).



Jan Gehl, Cities for People

Graphic showing a decrease in cyclist accidents as the numbers of miles cycled and miles of bicycle pathways increase

Providing adequate funding to create delineated and respected space for multi-modal transportation infrastructure would improve the overall incidental and perceived safety of urban streets with quality streetscapes and transportation facilities. In Syracuse, two intersections were noted as part of a list of most dangerous intersections for pedestrians and cyclists of upstate New York: **Seymour Street & South Geddes Street** with 10 incidents, **East Fayette Street & South Salina Street** with 7 incidents. The safety of both can be improved much through implementing bicycle treatments that would balance street activity and calm traffic.

References

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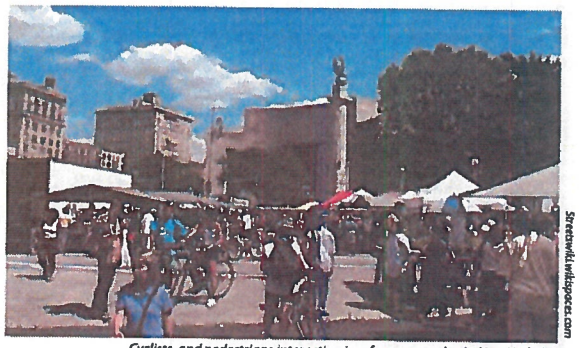
2. Finch D.J., P. Kompfner, C.R. Lockwood & G. Maycock. (1994) Speed, Speed Limits and Accidents, Transport Research Laboratory (www.trl.co.uk), Report 58.

3. US DOT. (2011) New data adds job creation to the many benefits of bicycle infrastructure. (http://fastlane.dot.gov/2011/01/new-data-adds-job-creation-to-the-many-benefits-of-bicycle-infrastructure.html)

4. Garrick, Norman and Wesley Marshall (2011) Evidence on Why Bike-Friendly Cities are Safer for All Road Users (http://files.meetup.com/1468133/Evidence%20on%20Why%20Bike-Friendly.pdf)

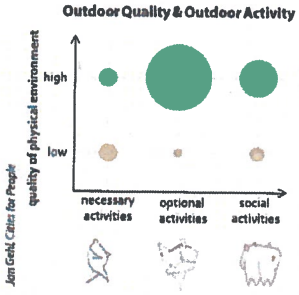
COMMUNITY

activity & understanding



Streetsinkl.wikispaces.com

Cyclists and pedestrians interacting in a farmers market in New York City



Activity

In addition to the many other tangible benefits, emerging studies are showing that bicycle infrastructure helps foster community interaction.

A safe, connected, well-designed bicycle network improves the quality of outdoor spaces, which is linked to the amount of social outdoor activities (see graph on left). The higher the quality of public spaces, the higher the frequency and density of social activities. More social activities cultivate stronger communities of active citizens through enabling and encouraging more diverse public interactions. Reinvestment in the shared public realm can improve social connections for people of all backgrounds by engaging citizens in a travel mode that allows for more **active awareness of their streets** and **participation in their neighborhoods.**

Active streets also strengthen safety by creating public places that are used regularly by all citizens. A consistent density of people on the streets provides a greater sense of community, as well as security against crime with more eyes on the street. Multi-modal transportation infrastructure is extremely socially valuable because of this effect of lively, self-policed streets.

"What attracts people most, it would appear, is other people."

William H. Whyte

Understanding

Without two tons of steel and glass separating them from their surroundings, cyclists are able to better understand the social atmosphere in which they liveand forge **deeper connections** with their city and fellow citizens.

In building a cycling-friendly environment with easily accessible and integrated infrastructure, we provide the opportunity for Syracuse's citizens to consider cycling as a rational mode of transport. This would overcome the fundamental attribution error (see box on bottom right) and invalidate the view that Syracuse is inherently a car-centric city. Understanding other citizens and the possibilities for Syracuse will allow us to move forward in providing infrastructural and social support for more sustainable individual choices.

Communities are formed by individuals who are aware and understanding of the shared physical and social aspects of urban living. It is in shared spaces and resources, like a bicycle network, that we are able to cultivate an appreciation for both similarities and differences, along with a resilience that enables coordination and cooperation in the face of economic and environmental challenges.

John Berry, The Post-Standard

Syracuse's first bicycle showcase in Near West Side in 2009

Nicholas Lee, The Post-Standard

Cyclist on Comstock Avenue bicycle lane

Fundamental Attribution Error (FAE)

The FAE is an effect described in social psychology. It is the tendency to attribute other people's choices to personal disposition and overlook the situational factors that one acknowledges as powerful in one's own choices[1]. In other words, we assume other people are acting more irrationally than they are, and that we ourselves are acting more rationally. This undermines the ability for people to understand that every individual chooses the mode of transport most available and suitable to their provided surroundings.

References

1. Drucker, Michael. (2010) The Fundamental Attribution Error in Transportation, Psystenance: sustainability through the minds eye

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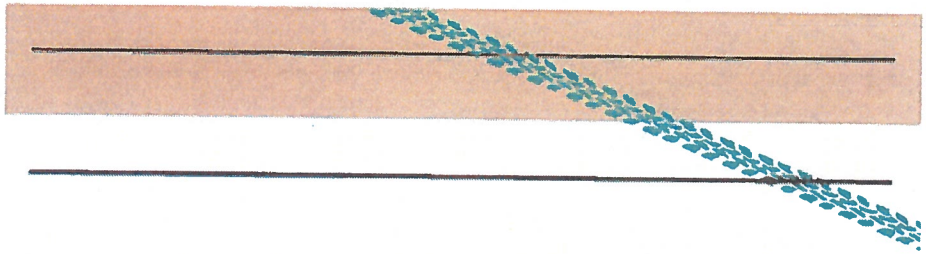


INVENTORY MEASURES

safety
connectivity
design

INVENTORY MEASURES

In determining which streets should be included in Syracuse's bicycle network, 13 metrics, or "appropriateness measures", were used. These were developed by the SMTC for use at a planning level. All data was evaluated and ranked using GIS. Many of the metrics are quantitative in nature, however, some are qualitative. For these qualitative measures, direct observation and professional judgment determined the rank.

The appropriateness measures were separated into three major categories: safety, connectivity, and design. Points of varying weights were assigned to each appropriateness measure. Criteria were then developed for each appropriateness measure and assigned a positive, neutral, or negative score. Positive scores received full points. Neutral scores received half points. Negative scores received no points.

SAFETY MEASURES

Many factors play a role in determining the bicycle safety of existing streets. Assessed below are primarily physical characteristics of streets from road quality, traffic speeds and volumes, to signal locations and heavy vehicle presence. All of these play an integral role in determining the level of cyclist comfort and security in participating in Syracuse's active transportation network.

Quality of Surface (5 Points)

High quality paved streets provide the best conditions for biking with smooth and regular surfaces that reduce bicyclists' need to swerve to avoid dangerous cracks or potholes. Streets with uneven pavement generally create unsafe conditions for biking.

The following criteria were developed to assess the appropriateness of surface conditions:

- smooth surface, uniform width
- irregular surface, non-uniform width
- surface deterioration, cracks, bumps

Our assessments are based on the 2010 annual assessment of all city roads in Syracuse by the Public Works Department, utilizing a scale of 1 to 10 (with 10 being the best road conditions). These figures were then divided by two and matched to the positive, neutral, and negative categories of the appropriateness measure 1-5 point criteria.

Traffic Volumes (15 Points)

Streets with low traffic volumes are preferable for bike treatments. The fewer the number of cars, the less chance there is for car-bike conflict. As a result, these streets are more safe and comfortable for the average bicyclist than high volume streets, which are generally avoided when planning bicycle treatments.

The following criteria were developed to assess the appropriateness of streets based on traffic volumes:

- low volume (<5,000 AADT)
- medium volume (5,000 – 10,000 AADT)
- high volume (>10,000 AADT)

Traffic volumes were determined by counts provided by the SMTC. In areas without counts, professional judgment was used. On the map showing traffic volumes, official count data is shown by a solid line and estimated data by a dotted line.

Average Traffic Speeds (10 Points)
Streets with low traffic speeds provide a desirable environment for bicyclists. As motor vehicle speeds increase, cyclist comfort decreases and the potential for conflicts increases.
The following criteria were developed for assessing the suitability of streets based on traffic speeds:

- +/- 25 miles per hour (desirable)
- +/- 35 miles per hour (possible)
- +/- 55 miles per hour (not recommended)

Due to a lack of actual speed data, the speed assessments used in our inventory measures are based on direct field observation and professional judgment. The three categories above allow a +/- 5 mph range of flexibility in classification. The gap between the yellow and red categories is a result of posted speed limits and conditions on major arterials and highways.

Presence of Signals (5 Points)
Depending on the distance between signals, the prevalence of signalized intersections can be viewed as positive or negative for bicycle mobility. Frequent, closely spaced signals require cyclists to constantly stop and go, which disrupts their momentum and requires more effort to build up speed after each signal. If bicyclists are required to make frequent stops, they may avoid the route or disregard traffic control devices. Infrequent signals were favored in our assessment.
The following criteria were developed for assessing the suitability of road segments with regard to signal frequency:

- infrequent signals (less than half of intersections on a street are signalized)
- occasional signals (about half of intersections are signalized)
- frequent signals (more than half of intersections are signalized)

The signal frequency data used in our inventory assessment was established by the City Traffic Control Center database and field verification.

Presence of Heavy Vehicles (5 Points)
Buses and trucks often pose problems for bicyclists. Visibility is a major factor, especially during right turning movements. Frequent starting and stopping can also increase the opportunity for car-bicycle conflicts. Bicycle treatments are generally avoided on streets with large numbers of transit or truck routes.
The following criteria were developed to assess appropriateness of streets based on the presence of heavy vehicle routes:

- no truck or bus routes
- either truck or bus routes
- both truck and bus routes

Our assessment of heavy vehicle presence was based on comparison of maps delineating Centro bus routes and approximated Designated Heavy Vehicle corridors, along with direct field observation of bus and truck activity on streets.

CONNECTIVITY

The appropriateness of streets for bicycle facilities is also assessed based on the potential to connect to existing facilities, origins, and destinations in the community.

Connections to Existing Bike Facilities and Lanes (10 Points)
Bike facilities function best as a network – a system of connected, continuous treatments that allow bicyclists to access many destinations. Streets that connect to existing facilities, such as bike paths or lanes, are preferable for new bike facilities.

The following criteria were developed to assess connectivity to existing facilities:

- several connections to other bike routes
- few connections to other bike routes
- no connections to other bike routes

Our assessment of connectivity to existing bike routes was based on two-to-four block adjacency to existing bicycle routes, including those to be implemented by the end of 2011.

Connections to Destinations and Other Neighborhoods (15 Points)
The most important indicator of connectivity is the ability to link origins, and destinations, and connect across neighborhoods. Destinations are locations that people visit, such as libraries, parks, schools, retail districts, and employment centers. Streets that provide direct routes between these locations function best for a wide range of cyclists in reducing travel time and increasing the accessibility of bicycling.
The following ratings for connectivity to destinations and neighborhoods were developed:

- access to destinations and other neighborhoods
- access to destinations or other neighborhoods
- access to neither destinations nor other neighborhoods

Our assessments on connectivity to destinations and other neighborhoods were made based on professional judgment and direct observation.

Access to Bus Routes (5 Points)
Unlike car users, bike users often switch modes and can easily utilize bussing systems to greatly increase their range. In Syracuse, Centro buses are all equipped with bike racks, making such transitions easier. Bussing can allow bicyclists to more easily access long distance destinations and can help reduce commute times. Therefore, streets that cross multiple transit routes are preferable for new bike facilities.
The following criteria were used to assess bus route connectivity:

- crosses multiple bus routes
- follows/parallels bus routes
- no nearby bus routes

Bus route connectivity of various roads was assessed using the Centro 2010 bus maps. The high incidence of positive rankings is due to the density of Syracuse's public transit options.

Quality of Experience (5 Points)
Bike facilities should be placed in locations which are visually engaging. Scenic amenities, such as parks, natural features, and historic structures encourage use, especially among more recreational cyclists.
The following criteria were developed to assess quality of experience:

- scenic amenities along route
- some scenic amenities along route
- no scenic amenities along route

The assessments for quality of experience was based on direct observationand verified through public involvement.

DESIGN MEASURES

In addition to considering safety and connectivity, it is critical that new bike facilities are planned for locations that can best physically accommodate and integrate them.

Topography (10 Points)

The topography of bike routes dramatically affects use, especially for bicyclists with lower confidence levels. Generally, bicyclists will avoid streets with major grade changes, as these can create challenging and dangerous conditions. Level terrain or a moderate grade is preferred when planning for bike treatments.

The following grade criteria for topography were used:

- grades from 0%-2%
- grades 2% - 5%
- grades 5%-8%
- grades >8%

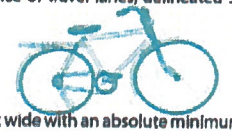
Slope categories were determined through by ADA guidelines. These guidelines delineate thresholds for physical exertion necessary when climbing specified grades. Our grade criteria assessments were made based on analysis provided by the SMTC using topographic data.

Width of Road from Curb to Curb (10 Points)

Travel lane width is critical in determining possibility and appropriateness of various bike treatments.For most treatments, the distance from curb to curb must be wide enough to accommodate both cars and bikes safely. Wide, paved right-of-ways allow for the comfortable coexistence of travel lanes, delineated shoulders, and bicycle lanes.

The criteria for appropriate distance from curb to curb are:

- distance is more than 42 feet
- distance is between 28 and 42 feet
- distance is less than 28 feet



These criteria assume that a desirable bicycle lane width is 6 feet wide with an absolute minimum of 4 to 5 feet depending on road conditions and an 11 feet motor vehicle lane.

Our assessments of width from curb to curb were based on information provided by the Department of Engineering and the Department of Public Works, as well as supplemented field investigation.

Presence of Parking Lanes (5 Points)

Since parking is at a premium in our city, preference is given to streets where bike treatments will not supplant existing parking supply. Streets with no on-street parking are prioritized for bike treatments. Streets with parking on one side (i.e. alternating or one-side metered parking) generally provide sufficient room for the addition of bike lanes, but can be problematic. This is especially true with alternate parking due to a lack of consistency in day-to-day lane usability.

The following criteria were developed for appropriateness of parking lane presence:

- no parking lane
- alternating or one side metered parking
- parking on both sides of street

Our assessments were made based on data assembled through remote sensing and Google Street View and direct observation.

Road Diet Feasibility (10 Bonus Points)

Preference is also given to streets that have the capacity for a "road diet" (car lane reduction), as well as other long-term capital enhancements, such as intersection treatments, traffic calming, and traffic diversion. These enhancements increase rider comfort, especially for less-experienced cyclists, while also benefiting pedestrians and property owners in slowing down traffic and enhancing the streetscape.

The following criteria were developed to measure the feasibility of long-term traffic calming:

- existing or future road diet
- no possibility of road diet

Our assessments on road diet feasibility were based on professional judgment and field observations of car lanes and road widths. The assumption was any road greater than or equal to 40 feet wide is a potential candidate for traffic calming measures.

INVENTORY MAPS

This section is concloded with the following maps:

Total Composite Score Map

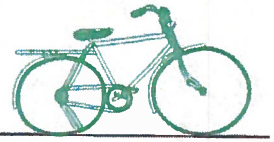
This map is a combination of all 13 aforementioned metrics. It is the gross aggregate map of corridors in Syracuse appropriate for cycling. The irregualr results are due to the fact that analysis was done in a block by block fashion. The three rankings were broken out by quanitile, giving a relatively even distribution to the blocks rated "good," "average" and "poor."

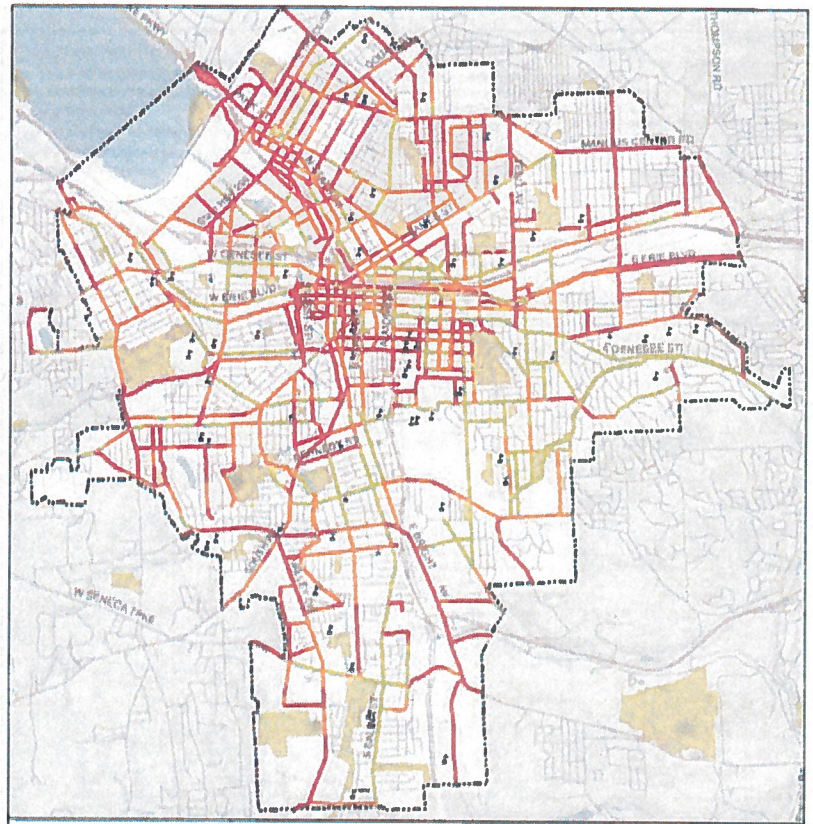
Priority Corridor Map

This map takes the "Total Composite Map" and cuts out the lower ranking corridors to create a blueprint for the city-wide bike network. In addition to removing the lowest rank streets, many other factors assisted in the creation of the final map. Creating common sense connections was essential, both internally for the creation of a coherent network and externally to ensure Syracuse's bike corridors connect with outside destinations and commuting patterns. Finally, extensive citizen feedback (See Apendix B) was instrumental in this final interation of the map. Many low volume neighborhood streets were added based on this feedback, many of which were not ranked through the aforementioned process. The short- to long-term priorities were developed based upon the original ranked value

Proposed Bicycle Network Treatments Map

This map highlights the possible treatments for each corridor. An explaination of these treatments is found in Chapter 3: "Tool Kit." Further discussion of these corridors is found in Chapter 4: "Neighborhood Recommendations."




Syracuse Bike Plan: Total Composite Score
Syracuse City Boundary
Composite Ranking
Good
Average
Poor
Streets
Parks
Schools
Railroad
Creek
0 0.3 0.6 1.2
Miles
Data courtesy of NYGIS Clearinghouse, City of Syracuse Department of Public Works, and ESRI (base relief map). Possible bike treatments were designated based on 13 "bike-ability" metrics as calculated by Syracuse DPW in Summer 2011. Classification based on Natural Breaks (Jenks).
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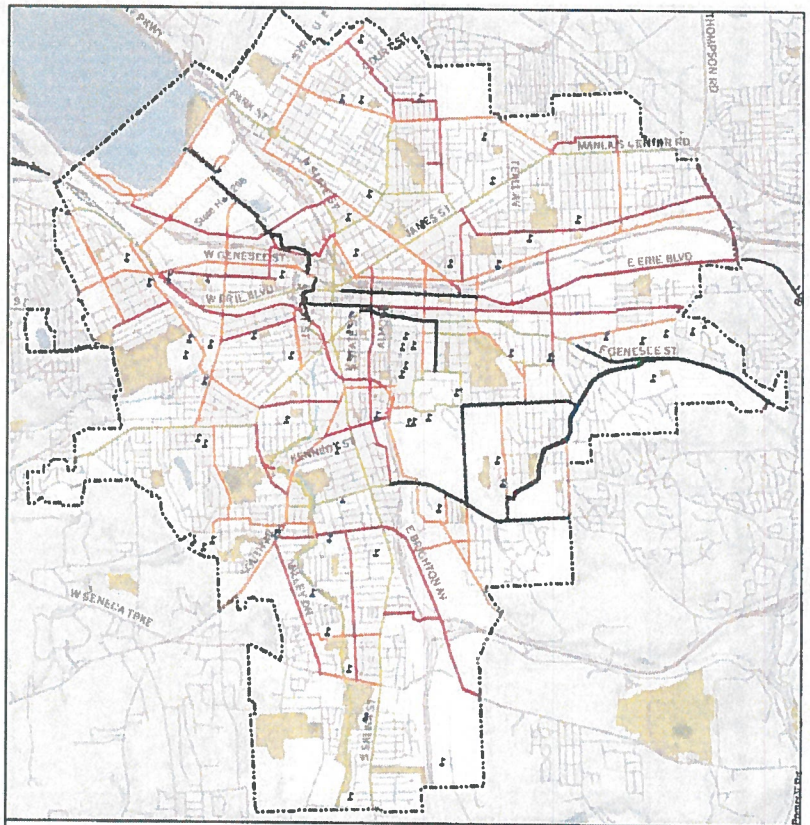
Syracuse Bike Plan: Priority Bike Lanes
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Miles
Data courtesy of NYGIS Clearinghouse, City of Syracuse Department of Public Works, and ESRI (base relief map). Possible bike treatments were designated based on 13 "bike-ability" metrics as calculated by Syracuse DPW in Summer 2011. Classification based on Natural Breaks (Jenks).
PriorityMap_BikePlan_100912.mxd
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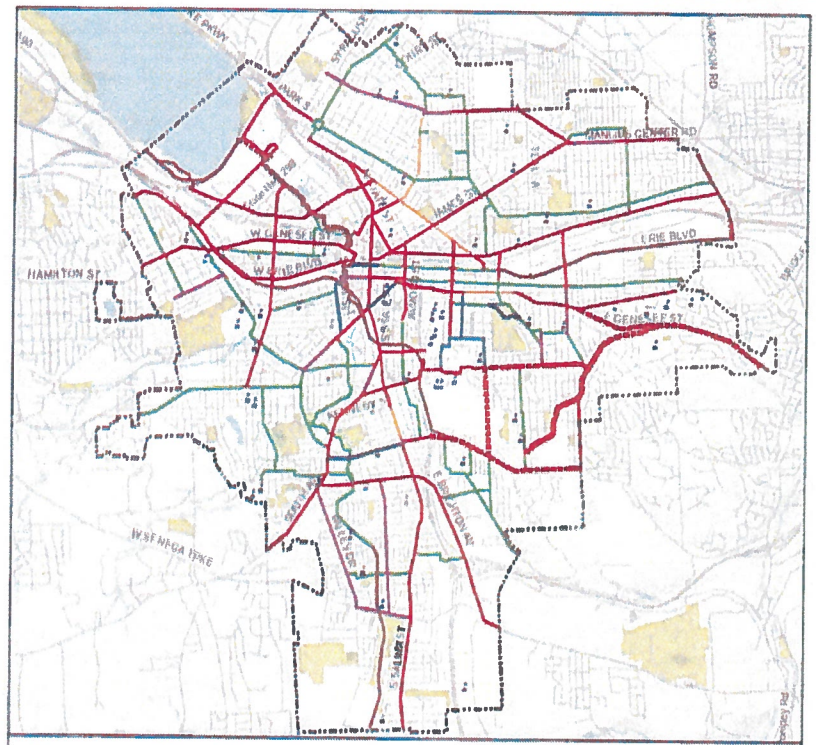

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TOOLKIT

pathway
parking

Recognizing the many benefits of increasing the population of regular cyclists in Syracuse from safety to recreation, Syracuse can facilitate a shift towards more balanced and access-oriented transportation planning through providing citizens with a safe, connected, and appropriately designed bicycle network.

To achieve this goal, we will utilize a variety of tools in building the infrastructural support for a cycling city. This Toolkit consists of two sections: Pathway & Parking. Each outlines the recommended designs with overall benefits, constraints, and suitability for Syracuse.

We have reviewed publications for bicycle path and parking design provided by the National Association of City Transportation Officials, Initiative for Bicycle and Pedestrian Innovation, and the Association of Pedestrians and Bicycle Professionals. Our design recommendations for appropriate public investments are also based on successful models of bicycle facilities from cities around the world with Syracuse's specific conditions in mind.

pathway

sharrows

Strengths

increase awareness for vehicles of possible cyclist traffic

create environments that facilitate predictable behavior and transit by both cyclists and motorists

low cost strategy for existing low-volume streets

Weaknesses

potential risk of being 'doored,' as lanes are often located between vehicular travel and parking lanes

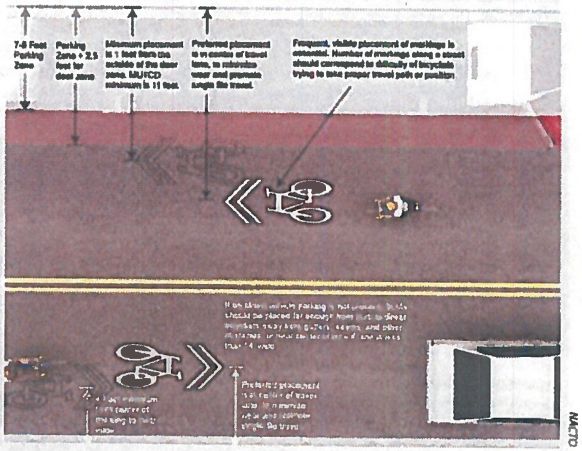
result in tendency for bicyclists to be pushed to edges of roadway due to lack of defined travel lane

painted marking can quickly fade in Syracuse climate unless durable material is used

Photo: PSM

Sharrow on a San Francisco street

Sharrows are shared streets with painted symbols located along the roadway to guide bicyclists to the best locations for travel. They are different from bike lanes and many other methods of infrastructure, because they do not designate a specific area of the road for only cyclists; the purpose of the markings is to help locate bicyclists on the road outside of the "dooring" zone and away from the main flow of cars.



NACTO

Diagram of shared roadways for cyclists and motorists

Applications & Special Considerations

Sharrows are generally low cost and most appropriate as a short-term initial implementation strategy on low-volume streets, as well as untreated but popularly cycled streets. The double arrows indicate where the cyclist should be centered.

For more on design and application, refer to pages 273 to 284 in the Urban Bikeway Design Guide by NACTO.

standard bicycle lanes

Bicycle lanes dedicate a portion of the roadway to bike movement, separated from automobile traffic. This is particularly necessary along streets with higher speed limits and moderate traffic volumes. They occur on roads with sufficient width for two separate travel lanes and are designated by striping, signage, and pavement markings.

Bike lane on two way street with parking in New York City

APPLICATIONS & SPECIAL CONSIDERATIONS

Applications for bicycle lanes generally include streets with (> / =) 3,000 average daily vehicular traffic (AADT) , with a posted speed of (> / =) 25 mph. On streets with higher traffic volumes that may include regular truck traffic, high parking turn-over, or a speed limit >35 mph it is recommended to consider options with greater separation between cyclist and vehicular traffic (see cycle tracks and neighborhood greenways).

STRENGTHS

increase awareness for vehicles of possible cyclist traffic

allow bicyclists to travel at preferred speed without interference from vehicular traffic conditions

create an environment that facilitates predictable behavior and transit by both cyclists and motorists

provide separate movement corridors for cyclists and vehicular traffic

potentially act as a traffic calming device by narrowing travel lanes, or being installed in conjunction with car lane reductions

WEAKNESSES

create potential risk of being 'doored,' as lanes are often located between vehicular travel and parking lanes

location along the street shoulder can be a safety hazard if not clearly marked as cycling on the road edge can be beyond the visibility range of motorists

far side of road often contains debris (like yard waste or broken glass) and can be a hazard to cyclists

painted marking can quickly fade in Syracuse climate unless durable material is used

For more on design and application, refer to pages 3 to 54 in the Urban Bikeway Design Guide by NACTO.

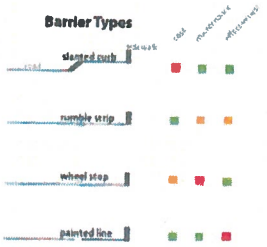
curbside bicycle lanes

Curbside bicycle lanes are lanes that allow cyclist movement between car parking lanes and sidewalk curbs, providing a strong buffer between moving cars and cyclists.

Curbside bicycle lane with wheel stops as barrier in Budapest, Hungary

APPLICATIONS & SPECIAL CONSIDERATIONS

Applications for curbside bicycle lanes are the same as those for regular bicycle lanes. However, curbside lanes provide a unique solution to streets with alternate parking. Depending on the treatment between the parking lane and curbside bike lane, snow removal may be a concern (see diagram below).



STRENGTHS

reduce risk of dooring by traveling on passenger side

allow bicyclists to travel at preferred speed without interference from vehicular traffic conditions

create an environment that facilitates predictable behavior and transit by both cyclists and motorists

increase capacity and efficiency of streets to incorporate bike lanes along vehicular routes

invite more users of all confidence levels

traffic calming

increases sense of safety

WEAKNESSES

requires public outreach and enforcement

must be wide enough for rider comfort and snow removal

visibility concern at intersections

painted marking can quickly fade in Syracuse climate unless durable material is used

For more on design and application, refer to pages 3 to 54 in the Urban Bikeway Design Guide by NACTO.

contra-flow bicycle lanes

Contra-flow bicycle lanes are lanes designed to allow bicyclists to ride in the opposite direction of motor vehicle traffic.

Thecitylab.com

Contra-flow bicycle lane in New York City

Strengths

provide connectivity and access for bicyclists traveling in both directions

eliminate dangerous wrong-way riding

allow bicyclists to use safer, low volume streets

increase capacity and efficiency of streets to incorporate bike lanes along vehicular routes

low cost solution to increasing accessibility of bike lanes

potential traffic calming

Weaknesses

create potential traffic conflicts at intersections if not clearly marked and made visible through the intersection

painted marking can quickly fade in Syracuse climate unless durable material is used

Applications & Special Considerations

Many of Syracuse's one-way roads could be converted into multi-modal, two-way streets by reducing the number or width of car lanes and providing a bicycle path heading in the opposite direction. This contra-flow lane is delineated by a double yellow line and can be on either side of the parking lane.

For more on design and application, refer to pages 31 to 45 in the Urban Bikeway Design Guide by NACTO.

cycle tracks

Cycle tracks are one or two way bicycle paths integrated into the urban streetscape, but separated from vehicular traffic & on-street parking. This separation is achieved through raised medians, on-street parking buffers, or bollards. The lane is often delineated by consistent and visible road markings, signage, and painted lanes.

http://www.bonzonzdesignstudios.com

Two-way cycletrack on University Ave, part of the Connective Corridor.

Strengths

provide separate and buffered movement corridors for cyclists and vehicular traffic

improve comfort and safety for bicyclists with a protected lane dedicated to cyclist traffic

invite a diverse user group due to more protected condition (i.e. more families, children, elderly, etc.)

eliminate fear of collisions when passing along vehicular traffic

Weaknesses

create potential traffic conflict at intersections if not clearly marked and made visible through the intersection

require more road width in order to provide adequate buffer space between cycle track and traffic or parking

high cost investment

painted marking can quickly fade in Syracuse climate unless durable material is used

Bikedenton.wordpress.com

One way cycle track buffered by bollards and striping on New York City street

Applications & Special Considerations

Applications for cycle tracks are often streets where bicycle lanes feel unsafe from conditions such as high traffic volumes, multiple lanes, and high speed traffic. To accommodate Syracuse's winter conditions, there must be adequate snow storage space between the cycle lane and vehicle lanes and enough width for small plows to clear these lanes.

For more on design and application, refer to pages 58 to 104 in the Urban Bikeway Design Guide by NACTO.

neighborhood greenways

Neighborhood greenways are streets with low traffic volumes, often residential, that run parallel to major arterials and often connect to neighborhood parks and schools. At major intersections, traffic calming devices are installed to assist the crossing of bicyclists and pedestrians. These devices may also prevent motorists from using the greenway as a cut-through. Other traffic calming measures, such as traffic circles or speed humps slow local traf using the greenway. Green infrastructure and street tree plantings further enhance these corridors.

Families enjoying a neighborhood greenway in Portland, OR

APPLICATIONS & SPECIAL CONSIDERATIONS

Often located on routes that run parallel to major arterials. The selected streets should be fairly direct and intuitive. Ideal streets are already low traffic volume at <3000 AADT. Neighborhood greenways can be designed to accommodate emergency vehicles and snow removal vehicles, especially when traffic calming interventions are restricted to main crossing streets.

For more on design and application, refer to pages 5 to 52 in the Fundamentals of Bicycle Boulevard Planning & Design by IBPI.

STRENGTHS

improvements benefit pedestrians, cyclists, and residents

reduce motor vehicle speeds and volume to provide an increased sense of safety

invite more youth and families to use due to reduced motor vehicle presence

WEAKNESSES

may increase congestion on major arterial roads

requires more investment in new traffic-calming infrastructure and signage

painted marking can quickly fade in Syracuse climate unless durable material is used

snow removal concerns

Crossing treatment at a neighborhood greenway in Portland, OR

Miniature traffic circle along a neighborhood greenway in Seattle, WA

bike boxes

STRENGTHS

allow cyclists to queue in front of cars

reduces right-turn conflicts between bicyclists and motorists

increase visibility of bicyclists on streets

cyclists don't have to breathe in tail pipe emissions

cost effective

WEAKNESSES

require public outreach and education to ensure proper usage of marked bicycle boxes

painted marking can quickly fade in Syracuse climate unless durable material is used

Bicycle boxes, a.k.a. 'advanced stop lines,' are markings on the roadway that designate an area for bicyclists to wait ahead of cars at traffic signals. They provide a space for bicyclists in front of vehicular traffic when stopped at lighted intersections

Intersection treatments in New York City, NY including a bike bix

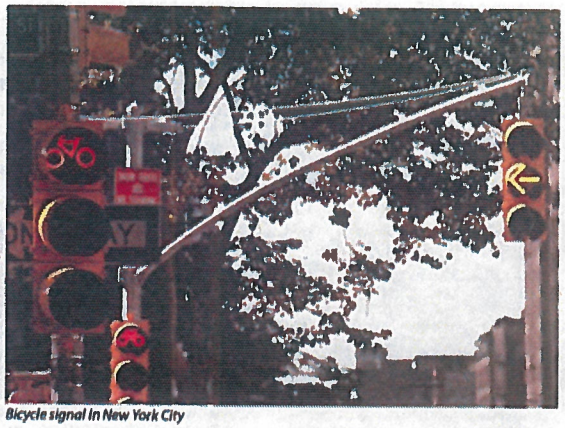
APPLICATIONS & SPECIAL CONSIDERATIONS

Many busy or complicated intersections would be more comfortable and safe for cyclists with delineated bicycle boxes for waiting ahead of motor vehicles at traffic signals. They are mainly used at intersections when rights on red and cyclists conflict.

For more on design and application, refer to page 26 in the Fundamentals of Bicycle Boulevard Planning & Design by IBPI.

bicycle signals

Bicycle signals are traffic lights that include a bicycle symbol and allot a certain amount of time for cyclists to move apart from motor vehicle traffic at intersections. Just like pedestrian and car signals, bicycle signals ensure safe crossing for a growing mode of transport.



Bicycle signal in New York City

APPLICATIONS & SPECIAL CONSIDERATIONS

Major intersections frequented by cyclists can be made safer with reduced vehicle conflicts by signalling bicycle movement apart from motor vehicle traffic. They are used frequently with cycle tracks and contra-flow bike lanes; they can used with neighborhood greenways. There are no snow considerations.

STRENGTHS

improves predictability of vehicle movement at intersections

provides high visibility and awareness of cyclists

helps eliminate conflicts between cyclists and drivers, especially with protected left arrows

WEAKNESSES

high cost for installation and signal coordination

require public outreach and education to ensure proper use

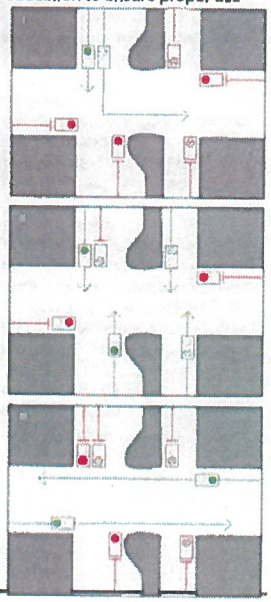


Diagram of traffic phasing with bicycle signals

For more on design and application, refer to pages 203 to 220 in the Urban Bikeway Design Guide by NACTO.

parking

When it comes to bicycle racks, not all designs are equal. While a wide range of sizes and styles of racks has been developed over the years, there are a few common criteria that determine which racks are suitable for municipally provided, public use today. Looking at standards from municipalities with well-established bicycle infrastructure, such as Portland (OR) and Davis (CA), appropriate bicycle storage must provide enough support to keep a bicycle upright, untangled, and secured at a minimum of two points.

inappropriate racks

GRID RACKS

Grid-style bicycle racks frequently cause wheel bending and tangling of closely parked bicycles. They do not offer a way to secure vehicles at two points and are very susceptible to theft.

Cyclecitiez.blogspot.com

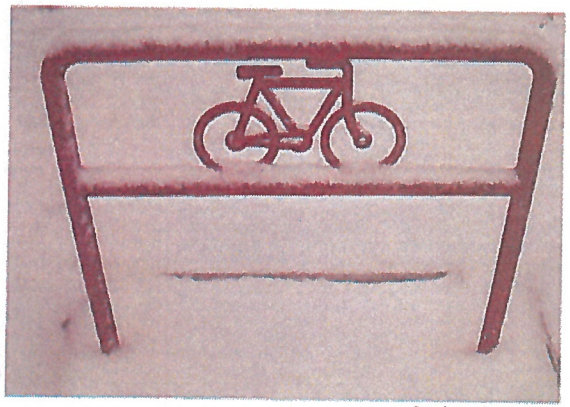
WAVE RACKS

Wave-style bicycle racks are a variation of the recommended bicycle staple rack (see next page), but do not offer any of the same advantages due to the connected, linear design. Bicycles cannot be secured at two points and positioned stably.

flooseveltislander.blogspot.com

staples

Bicycle staples are simple, inverted U-shaped metal piping, fastened to or set within the sidewalk. Each staple can secure two bicycles.



Bicycle staple in Syracuse

Applications & Special Considerations

The clean design, low cost, and sheer effectiveness of bicycle staples make them the ideal rack style for the varying physical and security conditions on Syracuse streets, allowing for an easily recognizable and trusted image of the Syracuse public bicycle facility. These staple racks are an excellent choice financially, functionally, and visually as accommodation for Syracuse's growing bicycle parking demand.

Strengths

offer a high variability in orientation options

require a minimal investment and maintenance cost per unit. In Portland, each staple rack costs $120 for material, tools, and labor when bought in bulk and so, offers secure parking for a low $60 per vehicle

can be used to create linear, curvilinear, perpendicular, and mass configurations in the streetscape in a uniform, cohesive manner

Weaknesses

metal piping must have non-circular cross-section to prevent theft (see below)

Inappropriate and appropriate shapes for bicycle staple piping

For more on design and application, refer to page 2-16 in the Bicycle Parking Guidelines by APBP.

corrals

Corrals are high-density parking facilities that most commonly are located in place of one or two on street parking spots. They are made up of a series of ground racks, preferably the recommended bicycle staples.

Bicycle corrals are in demand by storeowners in Portland.

Strengths

keep bicycle parking off of the sidewalk

provide parkign for 12 customers via bike in the same space as 1 via car

allow for a greater field of vision for turning vehicles when located on a street corner as opposed to a car

serve the same function as a bump out, providing a traffic calming effect for automobiles and a shorter crossing distance for pedestrians.

installation can occur on road surfaces as they are, allowing for a fairly simple retrofit of the space

serve as a highly visible element of bicycle infrastructure to the public, improving awareness and supporting bicycle travel as a viable alternative to automobile travel

can create a concentrated location where parking can usually be found

Weaknesses

high initial investment ; costs can vary depending on the roadside treatment of the corral such as fencing, reflective, or bollard structures, and the selection of the bicycle racks themselves

difficult to maintain with traditional street cleaning equipment; cities like Portland, Oregon have solved this problem by deferring the maintenance of these spaces to adjacent shop owners

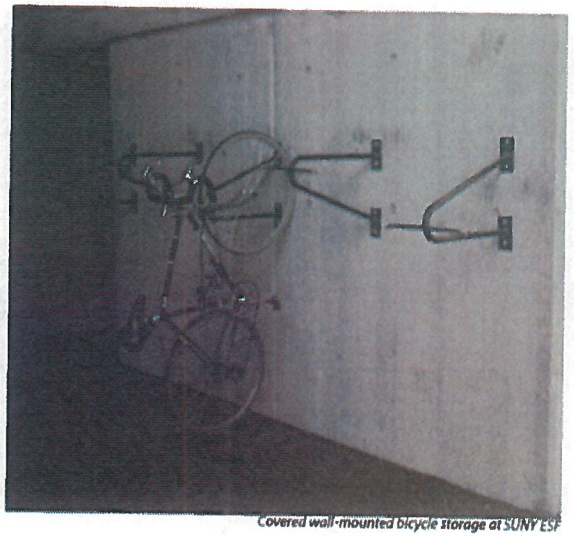
Applications & Special Considerations

The use of bicycle corrals could be very effective in areas of Syracuse. Located along established bicycle routes, bike corrals in Syracuse can be constructed in areas where parking is in demand. Many cities require businesses to request corrals and maintain the area. In the winter, corrals are usually removed to accommodate snow plowing. Syracuse would likely adopt such policies.

For more on design and application, refer to page 2-18 and pages 2-44 to 2-52 in the Fundamentals of Bicycle Boulevard Planning & Design by IBPI.

wall-mounted racks

Wall-mounted bicycle storage racks are arranged vertically on walls, rather than horizontally on the ground. These can be installed on any unused wall space, indoors or outdoors.



Covered wall-mounted bicycle storage at SUNY ESF

STRENGTHS

utilize excess capacity of blank walls

maximize efficient use of space

minimize costs associated with construction, rental, and use

positioning of bikes on walls lessens the risk of vehicle theft

WEAKNESSES

vertical orientation of racks requires that bicyclists be able to lift their bikes into position

should supplement ground larking and not be used in isolation

APPLICATIONS & SPECIAL CONSIDERATIONS

With many under-utilized walls outside and inside of buildings throughout the city, Syracuse can easily install wall mounted racks for efficient and free supplemental bicycle storage without concerns about snow removal.

For more on design and application, refer to page 2-19 in the Bicycle Parking Guidelines by APBP.

lockers

Bicycle lockers are parking areas incorporating boxed storage space for bicycles and associated accessories. Like an oversized gym locker, bicycle lock boxes can be rented out with personalized keys for a monthly or bi-annual fee. These lockers can be placed within a parking garage, business bike room, or on an uncongested sidewalk or alley.

Bicycle lockers in Los Angeles

STRENGTHS

provide secure storage for bikes and other belongings with a lock and key system

shelter cyclists' belongings from the elements

offer consistent access to daily parking spaces with reservation system

costs of maintenance would be paid for through rental fees

WEAKNESSES

high initial investment cost

requires a higher amount of dedicated space and maintenance

APPLICATIONS & SPECIAL CONSIDERATIONS

There are many opportunities to establish bicycle lockers and offer demanded, secure bike storage in existing parking facilities and less used street spaces throughout Syracuse. These sheltered facilities would be extremely useful to cyclists in inclement weather. The city of Portland offers bicycle lockers for $15 - $17 per month with a refundable $20 - $95 key deposit. Organizations such as Portland's TriMET bus transit stations provide lockers as cheap as $25 for six months with a $50 refundable key deposit. Syracuse may follow the example of Portland's systems in implementing our own.

For more on design and application, refer to pages 2-7, 2-11, 2-13, 2-15, and 2-31 in the Bicycle Parking Guidelines by APBP.

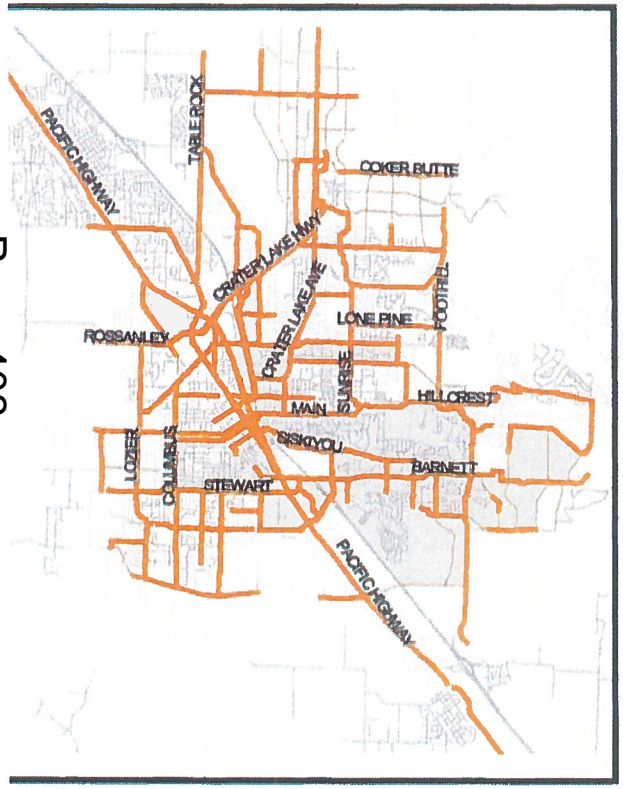
Exhibit K

Background

Rogue Valley cities have installed many bike lanes. But few people actually ride bicycles on city streets. Why? Because most people are afraid to ride in the streets, even with bike lanes.

Unsafe Bike Facilities in Medford

for Most Adults, Youth, Seniors, Disabled People, and Families



"Survey after survey and poll after poll has found again and again that the number one reason people do not ride bicycles is because they are afraid to be in the roadway on a bicycle. When they say they are 'afraid' it is a fear of people driving automobiles." (Roger Geller, Four Types of Cyclists)

Conclusions

- The existing facilities for riding bicycles on Medford streets are neither **safe or convenient** for most people.
- All Ages and Abilities designs offer multiple approaches to **safe and convenient** bicycling.
- More citizens will ride bicycles with **safer and more convenient** facilities.

More Details

The City is obligated, under State law, to create a transportation system that:

- Reduces reliance upon single-occupant motor vehicles
- Creates a well-connected network of streets with improvements for bike travel
- Increases the use of alternative modes such as bicycles
- Ensures that bike facilities are reasonably free from hazards, particularly automobile traffic that interferes with or discourages cycle travel for short trips
- Provides a reasonably direct route of travel between destinations for people using bikes
- Meets travel needs of bicyclists considering destination and length of trip

- With All Ages and Abilities design approaches, people riding bicycles can account for 10 percent or more of all citywide travel.
- With 10 percent of people traveling by bike, carbon emissions from transportation sources will decline by 10 percent or more.

Make Medford Safe for Biking by ALL AGES and ABILITIES

You shouldn't have to be BRAVE to bicycle!

How Can You Help?

Make Medford a place where people of all ages and abilities can safely and confidently ride their bikes.

- **Sign** the online "All Ages and Abilities" petition at bit.ly/svmedford.

- Are you interested in becoming an "all ages and abilities" **volunteer**? We could use your help. Contact president@siskiyouvelo.org to learn how you can help to create a bicycle-friendly Medford.

- Want to **learn more**? Navigate to www.siskiyouvelo.org/aaa/ to read more details about "All Ages and Abilities" bike facility designs and why they are critical to Medford's future.

The Problem

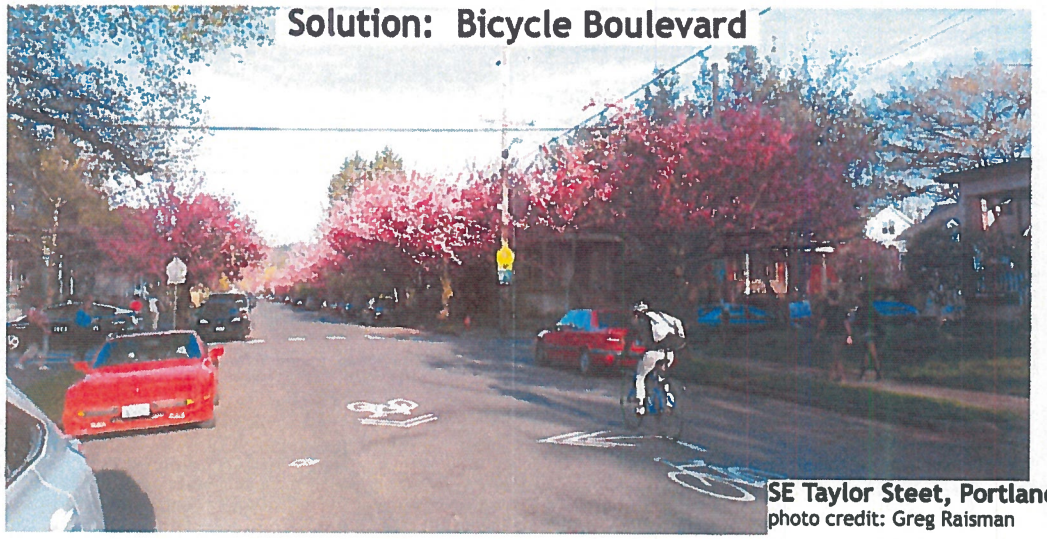
Major streets have traffic volumes and vehicle speeds that are too high for safe cycling. Where bike lanes exist, only the "strong and the fearless" bicyclists will use them but most people will not.

Constructing more bike lanes on major streets is not a prudent use of taxpayer money.

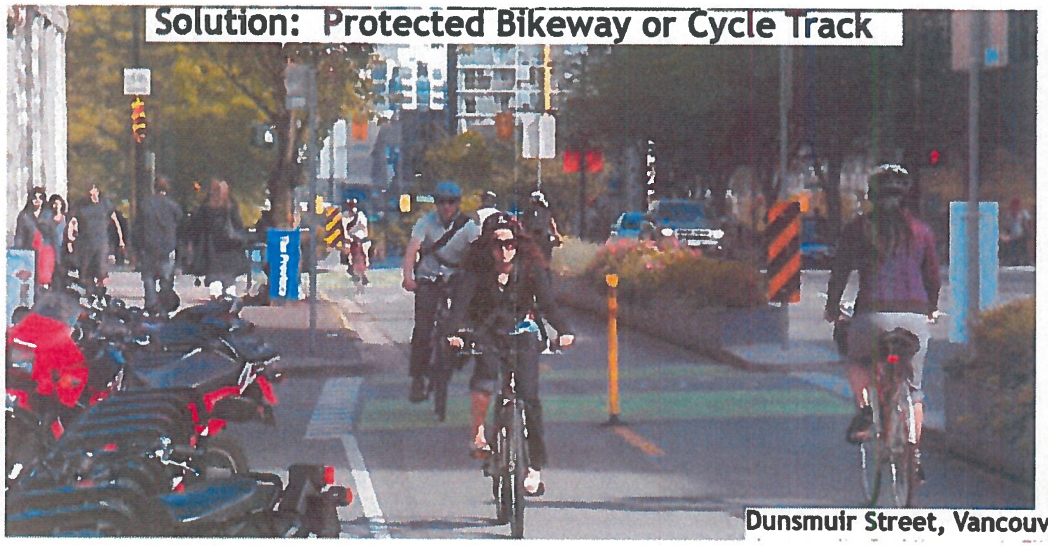
Solutions

We need a bicycle network that includes safe facilities for everyone. This may include bicycle boulevards, protected bikeways and separated bikeways. Bike lanes can also be a part of the solution when they are installed on low volume and low speed streets.

These solutions can meet the needs of everyone.



SE Taylor Steet, Portland
photo credit: Greg Raisman



Dunsmuir Street, Vancouver

Planning Commission

Minutes

EXHIBIT L

From Public Hearing on **October 11, 2018 (EXCERPT)**

The regular meeting of the Planning Commission was called to order at 5:30 PM in the City Hall Council Chambers on the above date with the following members and staff in attendance:

Commissioners Present
Patrick Miranda, Chair
David McFadden, Vice Chair
David Culbertson
Joe Foley
Bill Mansfield
Mark McKechnie (left at 7:00 p.m.)
E.J. McManus (arrived at 5:33 p.m.)
Alex Poythress (left at 6:29 p.m.)
Jared Pulver

Staff Present
Matt Brinkley, Planning Director
Kelly Evans, Assistant Planning Director
Eric Mitton, Deputy City Attorney
Alex Georgevitch, City Engineer
Greg Kleinberg, Fire Marshal
Carla Paladino, Principal Planner
Terri Richards, Recording Secretary
Dustin Severs, Planner III
Steffen Roennfeldt, Planner III

50. Public Hearings – **New Business**

50.4 CP-16-036 A legislative amendment to adopt a revised Transportation System Plan and amend applicable portions of the Comprehensive Plan including the Transportation element and Goals, Policies, and Implementation element. Applicant: City of Medford; Planner: Carla Paladino, Principal Planner.

Carla Paladino stated that the Comprehensive Plan Amendment approval criteria can be found in the Medford Land Development Code Sections 10.214 and 10.220. The applicable criteria were addressed in the staff report and hard copies are available at the entrance of Council Chambers for those in attendance. Ms. Paladino gave a staff report.

Commissioner McKechnie left the meeting at 7:00 p.m.

Commissioner Mansfield stated that Siskiyou Velo is not in favor of the amendment. What is her response to serious criticism by the Siskiyou Velo organization? Ms. Paladino reported that staff does not have a written detailed response, point by point, to their findings. Staff will include those if necessary. Staff feels they have addressed the Goal 12 requirements for the Transportation Planning rule relating to bicycle facilities. That there is of differing opinion. At this point staff does not agree with Siskiyou Velo.

Commissioner Foley asked for clarification of providing findings or direct staff to provide the City Council with supplemental findings related to any new testimony. Ms. Paladino reported this is in response to Siskiyou Velo testimony and other things that have been stated. Making sure that

staff addresses those concerns and provides a memo that addresses those based on staff's findings.

Commissioner Culbertson stated that on the bicycle plan there are notations that show shared use paths. It seems as though part of those paths in the east Medford area are utilizing irrigation ditches. Unless the City of Medford has a joint easement with those property owners the City does not have a right to use those as paths. Ms. Paladino stated that the City does not have detailed easements yet. These are part of the Leisure Services Plan process. Those would need to be refined at some point. As development occurs staff would be looking for path connections. Maybe they are adjacent to the canal and maybe they are not.

Commissioner Culbertson stated that one of them cuts directly through two holes at Rogue Valley Country Club. Ms. Paladino commented that if the Country Club is not redeveloped staff would not be seeking an easement.

Commissioner Culbertson reported that it also identifies the road that will be the future connection of Murphy Road to Pierce Road which also goes directly through the Country Club. Since those are on the plan if the City is not able to get full connection to walking paths or the roadway what happens to them if they are on the plan as proposed? What right does the landowner have if they are not willing for the City to build? Does the City have eminent domain to build the road? Ms. Paladino stated that the reason they are in the plan is that if the land redevelops it is easier to have the street connection documented in the plan now rather than having to come back and change the plan and work with the property owners later.

Commissioner Culbertson is fine with the roadway but he is opposed to utilizing any paths on irrigation ditches.

Mr. Mitton agreed with the point that any easement for irrigation water purposes does not inherently carry the right to put a path there. Whether there be discussion with the property owners to site a path next to the irrigation ditch is a separate issue than what is in the TSP.

The public hearing was opened.

a. Harlan Bittner, 4102 Southview Terrace, Medford, Oregon 97504. Mr. Bittner is the President of the Siskiyou Velo Club. The TSP update lacks sufficient details to ensure the bicycle facilities will be implemented in a way that meets the requirements of the Oregon Transportation Planning Rule. Mr. Bittner submitted a brochure that provides a brief summary of some of the design approaches the Club advocates.

b. Ben Karetnick, 3485 Hollywood Avenue, Medford, Oregon, 97501. Mr. Karetnick is in agreement with what has been shared. He strongly encouraged moving this amendment forward.

c. Gary Shaff, 516 Herbert Street, Ashland, Oregon 97520. Mr. Shaff requested that the Planning Commission reject the current TSP draft and insist that it establishes a goal for bicycle mode share somewhere above 10% of travel in 2038. Provide for the modification and reconstruction of the existing TSP to make it safe and convenient for all modes so that everyone can on their preferred mode travel to everywhere.

d. Evan MacKenzie, 2434 County Club Drive, Medford, Oregon 97504-7712. Mr. MacKenzie wanted to make sure that the Planning Commission understands that bicycles are transportation. They are not alternative transportation. Mr. MacKenzie submitted his testimony into the record.

e. Michelle Manion, 2434 County Club Drive, Medford, Oregon 97504-7712. Ms. Manion talked about bike safety from a different view point. The City of Medford could use a more walkable and bike-able neighborhoods for health and safety.

f. Ann Smith, 3182 Forest Hills Drive, Medford, Oregon 97504. Ms. Smith moved to Medford for the express purpose of using her bike as primary means of transportation. In Medford the lack of connected and safe facilities she experiences discourages all but the doggedly determined using a bike as a mode of travel. Several times a week for the last six years she has biked to work on Highway 62 between Delta Waters and Northgate Market Place near the intersection of Highway 99. The bike lane is narrow with an unprotected buffer in places that gives the illusion of protection. She strongly urged the City of Medford to work with the County and State to ensure that its residents are provided with safe and convenient functional facilities that meet the standards of safety and accessibility for all ages and abilities and that this Transportation System Plan strives to implement.

Vice Chair McFadden commented that the Planning Commission agrees with her but her desired route is not within the confines of Medford. It is all done by the engineers of the Oregon Department of Transportation. She has been riding in the middle of a construction project for the last three years.

Ms. Smith did not ride during the construction. She understands her route is State built. After all the construction her journey did not get any safer. Her alternative routes do not have bike facilities.

g. Mike Montero, 4497 Brownridge Terrace, Medford, Oregon 97504. Mr. Montero is in support of the Transportation System Plan.

h. Robert Shand, 406 Beatty Street, Medford, Oregon 97501. He is present tonight regarding bicycle and pedestrian safety. Medford's culture needs to change to include bicycles. Think of the future.

i. Randy Jones, 815 Alder Creek Drive, Medford, Oregon 97504. Mr. Jones is in favor of scenario #5 and encouraged the Planning Commission to forward this to the City Council.

Ms. Paladino reported that staff recognizes there are concerns regarding multi-modal facilities and trying to upgrade the bicycle facilities. Staff recognizes the City has a built environment that needs to be retrofitted. Staff is making efforts within the TSP draft to get better systems to get the bike and pedestrian facilities in place.

In regards to the Foothills project, that was a Transportation Facility project earlier this year that the City Council approved. It does include an offsite multi-modal path between Hillcrest and McAndrews. It is an approved project moving through Engineering.

One of the action items within the goals and objectives is that staff would be looking, hopefully in the near future, at a specific bike/pedestrian plan to address some of the issues more deeply. This Transportation Plan is addressing all transportation modes in a generalized plan. Staff recognizes a bicycle facility plan would be a better way to review that.

Alex Georgevitch, City Engineer stated that he heard a lot of testimony this evening about bikes and the facilities in the plan. He does not disagree with most of the testimony this evening. The Transportation System Plan is a planning level document, not a detailed engineering design guideline. When it gets to the City Council through Transportation Facility hearings they get into those details and built environment. The Transportation System Plan has considered the built environment as part of the major changes that are going on in this document. It is not as simple as providing guidelines and being able to follow them. They have proactively made changes with Foothill being a perfect example facility that is planning the first buffered bike lanes including multiuse paths.

There were statements made that he believes are inaccurate, especially about when someone extrapolates that sharrows should be put on a facility that an eight year old should be able to ride on at eight miles an hour. He does not know where that was extrapolated from. The Engineering Department follows AASHTO guidelines on placement of sharrows on all of the facilities they put in town.

Mr. Mitton stated that a lot of the discussion this evening has been on policy issues. It is not his job to weigh in on policy issues. Whether the City should put more resources or less towards bicycling is outside of his job description. However, a concern was raised by a couple testifiers about whether the draft TSP complies with State law, specifically Oregon Administrative Rules Division 660-012 and ORS Chapter 659 and 659A dealing with unlawful discrimination. He appreciates the concerns. He spent a good amount of time today going back through and he must respectfully but vigorously disagree that the draft TSP is legally insufficient. He believes that what is being presented right now is compliant with the State TSP Rules and OAR Division

660-012. He emphatically feels that nothing in this draft TSP would constitute unlawful discrimination under ORS 659A.

The public hearing was closed.

Motion: The Planning Commission based on the findings and conclusions that all of the applicable criteria are satisfied, forwards a favorable recommendation for approval of CP-16-036 to the City Council per the staff report dated October 4, 2018, including Exhibits A through I and including funding Scenario 5 in the TSP.

Moved by: Vice Chair McFadden Seconded by: Commissioner Foley

Commissioner Pulver stated that he is sympathetic with a lot of the testimony from the biking community he can say without reservation that the biking community was well represented in the TSP meetings and their concerns were heard loud and clear. If they draw nothing else from the draft TSP they should draw that there is a significant funding shortage for all the transportation needs of this community. In the testimony he heard this evening there was not discussion on how to solve that. He will be voting in favor of the amendment and encouraged his fellow Commissioners to do the same.

Mr. Mitton wanted to make sure they addressed the last bullet point. There was one Commissioner that addressed their feelings on that. It would be helpful for feedback if people wanted to weigh in to specifically provide findings or direct staff to provide the City Council supplemental findings related to the new testimony. The staff report was written before a lot of the testimony was made today. If the Planning Commission feels the comments made this evening or that the staff report adequately addressed it preemptively that is fine. If there are either findings that this Commission wants to make or if this Commission wants staff to provide additional findings on those issues for the City Council, some direction would be helpful.

Chair Miranda's perspective is that although some of the testimony this evening has been from citizens that the Commission may or may not have previously heard from, the resounding opinion is still the same in this meeting as well as in the JTS forum. Many of the perspectives have been represented over the timelines. He believes the TSP is the City's best foot forward.

Commissioner Foley thanked the people that came to testify. It is important to have citizen involvement. He has a lot of sympathy for those folks. He does not ride his bike as much anymore because of the reasons Mr. Montero mentioned. He likes what he sees in the newer developments. There is flexibility in the Plan to deal with those issues. This Plan is a good start. He is going to vote for it.

Roll Call Vote: Motion passed: 6-1, with Commissioner Mansfield voting no.

Exhibit M

PLANNING DEPARTMENT

Transportation System Plan

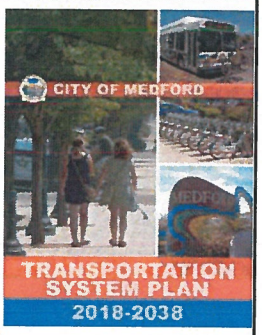
Planning Commission Hearing
October 11, 2018

PRESENTED BY THE CITY OF MEDFORD | WWW.CITYOFMEDFORD.ORG

Proposal

Comprehensive Plan Amendment to:

- Replace the Transportation Element with the revised Transportation System Plan (2018-2038)
- Amend the Public Facilities Element
- Amend the Goals, Policies and Implementation Strategies Element



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Authority

- Legislative Action
- Planning Commission Recommendation; City Council Decision
- City Council Hearing scheduled for November 1st

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Applicable Criteria §10.220 (B)

Comprehensive Plan, Review, and Amendments chapter: Amendments [to Conclusions] shall be based on the following:

1. A change or addition to the text data, inventories, or graphics which substantially affects the nature of one or more conclusions.

Pgs. 168-195

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Applicable Criteria §10.220 (B)

Comprehensive Plan, Review, and Amendments chapter: Amendments to [Goals and Policies] shall be based on the following [criteria 1-6]:

1. A significant change in one or more Conclusion.
2. Information reflecting new or previously undisclosed public need.
3. A significant change in community attitudes or priorities.
4. Demonstrable inconsistency with another Plan provision.
5. Statutory changes affecting the Plan.
6. All applicable Statewide Planning Goals.

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Applicable Criteria §10.220 (B)

Comprehensive Plan, Review, and Amendments chapter: Amendments to [Implementation Strategies] shall be based on the following [criteria 1-6]:

1. A significant change in one or more Goal or Policy.
2. Availability of new and better strategies such as may result from technologies or economic changes.
3. Demonstrable ineffectiveness of present strategy(s).
4. Statutory changes affecting the Plan.
5. Demonstrable budgetary constraints in association with at least one of the above criteria
6. All applicable Statewide Planning Goals.

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Project Overview

- Purpose
- History
  - Replace current TSP
  - Accommodate future growth (2018-2038)
- Project Team
  - Kittelson & Associates
  - Staff, JTS/CAC, TAC, BPAC, PC, and CC
  - Public

TSP Contents

MedfordTSP.com

Volume I Main Document & Attachments

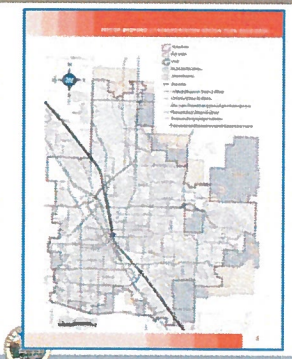
- Introduction
- Goals and Objectives
- Existing Conditions & Future Needs Assessment
- Transportation Funding & Implementation
- Transportation System Plan
- Key Code and Policy Amendments

Volume II (Appendix)

- Background data & Technical Memoranda

Introduction

- Regulatory Context
- UGB Areas & Regional Plan
- TSP update process
- Prioritization of Plan Elements



Visions, Goals, Objectives, and Actions

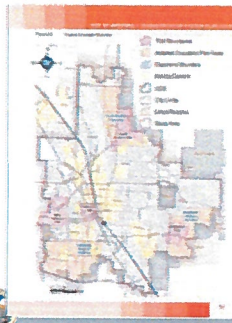
In 2038, the City of Medford will continue to be the regional and economic center of the Rogue Valley and will be served by a transportation system that is safe, efficient, and pleasant to use. The City's many different neighborhoods, districts, and destinations will be well connected. The … transportation system will also be well connected to the regional and state system. People will be able to drive, walk, bike, or use public transportation to reach stores, restaurants, parks, schools, work and other common destinations. Gateways and activity centers will have attractive streetscapes that are inviting.

Visions, Goals, Objectives, and Actions

- 6 Goals, 21 Objectives, & 82 Action Items
- Originally developed by JTS/CAC
- Proposed GOAs modified by the public and Advisory Committees/Commission/Council

Existing Conditions & Needs Assessment

- Roadways/Freight
- Pedestrian/Bicycle
- Activity Centers/TODs
- Public Transportation
- Air, Water, Rail & Pipeline System



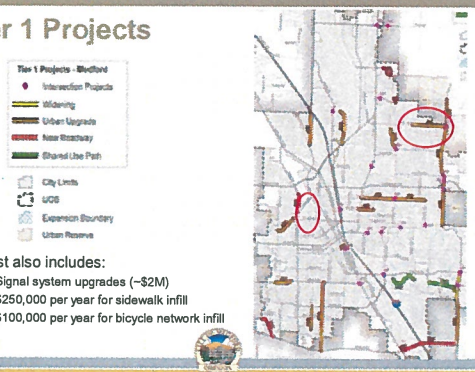
Transportation Funding & Implementation

- Projected Revenue = $88,440,343
- Potential Funding Sources
  - System Development Charge revisions
  - Local Improvement Districts
  - Local gas tax
  - Partnerships

Project Funding Scenarios

Scenario #	HB2017 Funds	Annual Grant Funding	20-year Revenue Available for Capital Projects	Difference from Scenario 1	# of Tier 1 Non-LOS Projects
1	*Projects*	*$700,000*	*$72,440,343*	*$0*	*23*
2	Maintenance	$700,000	$35,859,063	($36,581,280)	9
3	Projects	$3,000,000	$118,440,343	$46,000,000	39
4	Maintenance	$3,000,000	$81,859,063	$9,418,720	26
5	Projects	$1,500,000	$88,440,343	$16,000,000	28
6	Maintenance	$1,500,000	$51,859,063	($20,581,280)	17

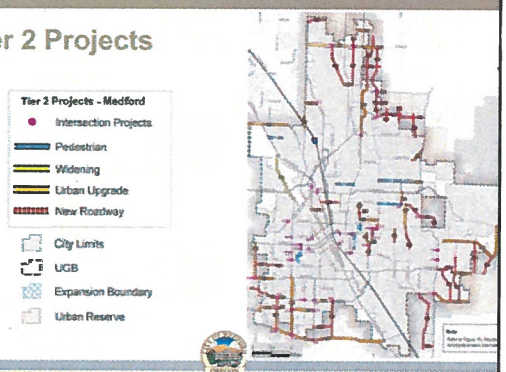
Tier 1 Projects



Tier 1 list also includes:

- Signal system upgrades (~$2M)
- $250,000 per year for sidewalk infill
- $100,000 per year for bicycle network infill

Tier 2 Projects



Transportation System Plan

- Street Plan
- Pedestrian Plan
- Bicycle Plan
- Transit Plan
- Freight/Intermodal Plan
- Parking Plans
- Travel & Transportation Demand Management
- Modal Goals & Standards
- Water/Air/Pipeline

Functional Classifications


Bicycle and Pedestrian Plans
Existing Bike Facilities
Existing Bike Facilities - Lower Stress Design Desired
Existing Neighborhood Bikeway
Neighborhood Network
Reconfigure to Provide Bike Facilities
Reconstruct Sidewalk to provide widened Bike/Ped Facility behind the curb
Sign and Stripe Neighborhood Bikeway
Planned Public Access Easement
Bike Facilities Included in Roadway Project
Existing Shared Use Paths
Planned Shared Use Paths
Essential Destinations
Expansion Boundary
Urban Reserve
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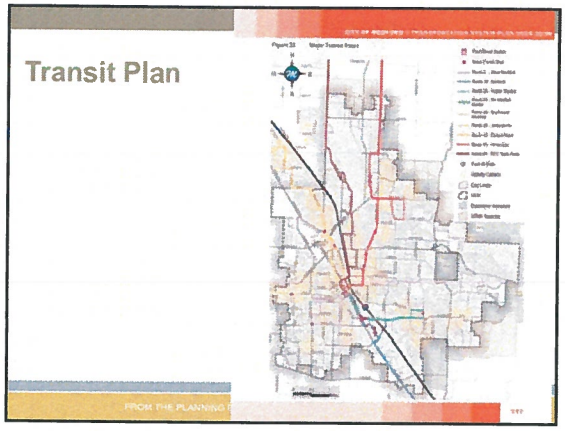
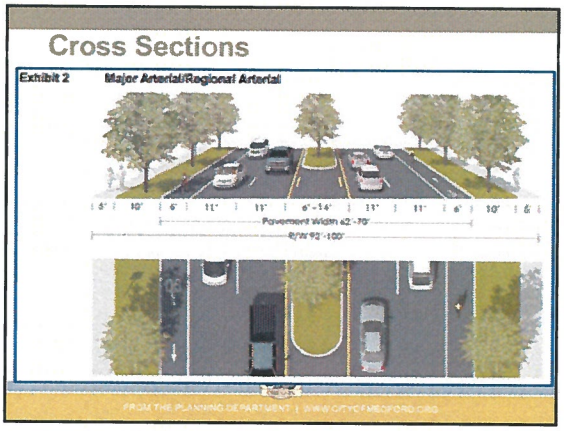

Transit Plan
FROM THE PLANNING


Cross Sections
Exhibit 2
Major Arterial/Regional Arterial
Pavement Width 62'-70'
R/W 92'-100'
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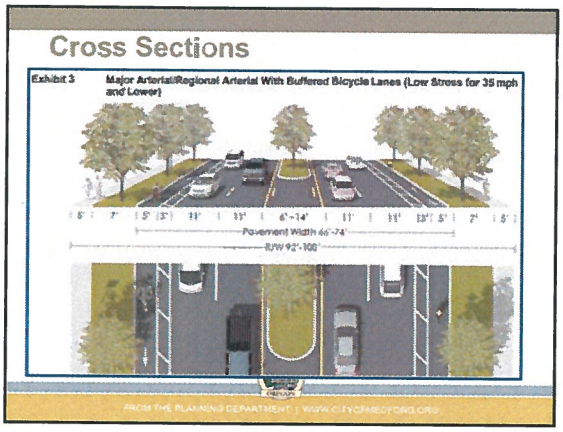
Cross Sections
Exhibit 3
Major Arterial/Regional Arterial With Buffered Bicycle Lanes (Low Stress for 35 mph and Lower)
Pavement Width 66'-74'
R/W 92'-100'
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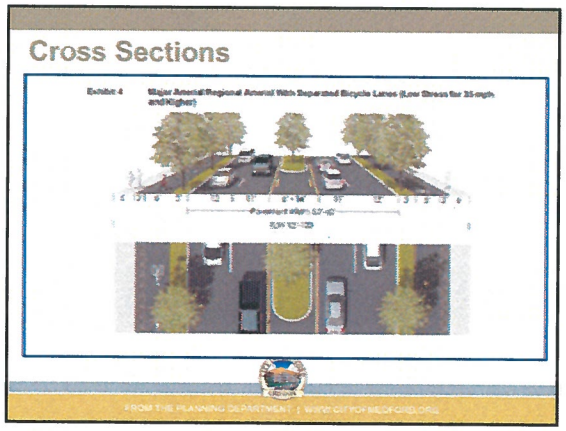
Cross Sections
Exhibit 4
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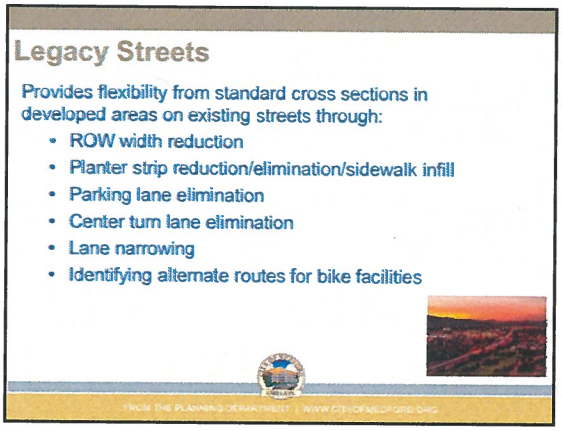
Legacy Streets
Provides flexibility from standard cross sections in developed areas on existing streets through:
• ROW width reduction
• Planter strip reduction/elimination/sidewalk infill
• Parking lane elimination
• Center turn lane elimination
• Lane narrowing
• Identifying alternate routes for bike facilities
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Key Code & Policy Amendments

- Level of Service standards update
- Roundabout analysis policy
- Legacy Street standards
- Provide PC with authority/flexibility to modify planter strip & r-o-w widths

Changes to S. Stage Description

- Made two projects for 537 (S. Stage Rd.)
  - 537a, Environmental Process & R-O-W – Short term
  - 537b, Construct new roadway – Long term
  - Footnote updated
- Projects 609, 610, I-45, I-73 – Mid term
- Projects 611, 721, I-13, I-24- Long term

New Exhibits

- Exhibit F – Support for All Ages/Abilities
  - Bonnie Goldfein
  - Jon Buckley
  - Martha Howard-Bullen
  - Teri Moser
- Exhibit G
  - E-mail from Gary Shaff
  - Siskiyou Velo Testimony
  - Designing for All Ages and Abilities guidance for Bike Facilities
- Exhibit H
  - Dan Thorndike e-mail

New Exhibits

- Exhibit H
  - E-mail from Dan Thorndike
- Exhibit I
  - E-mail from Gary Shaff
  - 233 Days until 2019 Fire Season
  - Global High Shift Cycling Scenario
  - Transport Reviews

Recommended Action

Forward a favorable recommendation for approval of CP-16-036 to the City Council per the Staff Report dated October 4, 2018, including all exhibits and any noted changes:

- Modification of project descriptions
- Identify if a different funding scenario should be used (Scenario 5 is in the TSP)
- Provide findings or direct staff to provide Council with supplemental findings related to any new testimony

CITY OF MEDFORD
OREGON

THANK YOU

FROM THE
PLANNING DEPARTMENT

City of Medford

City Attorney's Office

MEMORANDUM

TO: City Council, via City Manager Brian Sjothun
FROM: Lori Cooper, City Attorney
RE: Legal Review of Draft Transportation Plan Update
DATE: October 22, 2018

In anticipation of Council consideration of the draft Transportation System Plan Update (TSP), this memo discusses 1) whether the draft TSP prepared by Kittleson and Associates meets legal requirements and 2) whether the goals, objectives, and action items contained in the draft TSP are intended to be mandatory or whether they are guidelines that do not need to be strictly adhered to.

1. **Legal Sufficiency Analysis of the Draft TSP**

Cities and counties must adopt regional and local TSPs as part of their comprehensive plans (OAR 660-012-0015(4)).

A TSP must be consistent with other TSPs and planning documents governing the region it serves and with the Oregon Transportation Plan and its modal and topic plans.

A TSP must:

- Show how the City's transportation goals meet the goals and needs of planned land uses
- Determine where planned transportation improvements should be located and what right-of-way needs to be protected
- Provide rationale for making prudent transportation investments and land use decisions
- Identify and advocate for projects and services the community would like, but cannot fund within the planning horizon

The TSP document is the culmination of the planning process that identifies the goals and objectives of the TSP update and the new policies, plans, programs, and projects that will shape the transportation system over the planning horizon. With regards to actual content, the Transportation Planning Rule defined in Oregon Administrative Rule 660-012 outlines specific content that is required to be included in all TSPs.

The TSP goals, objectives, and recommended actions must ensure that adopted policy, land use, and development requirements are consistent with (and can help achieve) the desired transportation system. The TSP must include findings of compliance with applicable statewide planning goals and acknowledged comprehensive plan policies and land use regulations.

The following discussion lists the required elements of a TSP as found in the Transportation Planning Rule (OAR 660-012-0020(2)) and provides citations to where the information is found in the Draft City of Medford TSP.

a. A determination of transportation needs

The draft TSP contains a determination of transportation needs at *Pages 23-29 and Appendixes E and H.* As required by OAR 660-012-0030, the TSP identifies state, regional and local transportation needs, needs of the transportation disadvantaged, and needs for movement of goods and services.

Population and employment forecasts and distributions that are consistent with the Comprehensive Plan were used to determine transportation needs. *Page 18; App. L, Pages 7, 9, and 13.*

b. A Road Plan

The draft TSP includes a road plan for a system of arterial and collectors and standards for the layout of local streets and other important street connections. *Pages 59-96, Attachments B-D, Appendixes J and K.* The functional classifications of roads in the TSP are consistent with the functional classifications of roads in the state and regional TSP's and provide for continuity between adjacent jurisdictions. *Pages 59-76, Appendix J.* The standards for the layout of local streets provides for safe and convenient bike and pedestrian circulation. *Pages 100-114*. New connections to arterials and state highways will be consistent with designated access management categories, providing reasonably direct routes for bicycle and pedestrian travel. *Pages 13, 59, 62, 67, 69, 89, and 112.*

The inventory and general assessment of existing and committed roads by function, type, capacity, and condition are found at *Pages 18-24* and include information on the capacity of the roads (*Pages 23-24)*, the degrees to which these capacities have been reached or surpassed (*Pages 23-24)*, and the assumptions upon which these capacities are based *Appendixes C and D*.

In addition, a system of planned streets is identified, and includes a description of the type or functional classification of planned streets and their planned capacities and performance standards. *Pages 77-96*.

The TSP contains a description of the location of streets and establishes the general corridor within which streets may be sited. *Pages 77-96*. A map showing the general location of proposed streets, a description of parameters such as minimum and maximum road right of way width and the number and size of lanes, and other details are also included in the draft TSP. *Pages 95-96.*

c. A Public Transportation Plan

The draft TSP describes public transportation services for the transportation disadvantaged and identifies service inadequacies. *Pages 115 – 116.*

Existing and planned transit trunk routes, exclusive transit ways, terminals and major transfer stations, major transit stops, and park-and-ride stations are identified. *Pages 115-116.*

d. A Bicycle and Pedestrian Plan

A bicycle and pedestrian plan for a network of bicycle and pedestrian routes throughout the City is featured on *Pages 100-115*. The inventory and general assessment of existing and committed bicycle and pedestrian facilities by function, type, capacity, and condition are found at *Pages 108-109 and 115*.

In addition, a system of planned bicycle and pedestrian facilities is identified at *Pages 109-114.*

The TSP contains a description of the location of planned bicycle and pedestrian facilities at *Pages 112-115*. A map showing the general location of proposed bicycle and pedestrian improvements (*Page 114*), a description of facility parameters, and other details are also included in the draft TSP. *Pages 100-114.*

e. An air, rail, water, and pipeline transportation plan

The draft TSP contains discussions of the following transportation facilities: air (*Page 134*), rail (*Page 118*), water (*Page 134*), and pipeline (*Page 135*).

f. Transportation system management and demand management

Transportation system management and demand management are discussed in the draft TSP at *Pages 118, 119, and 134.*

g. A Parking Plan

The parking plan is discussed in the draft TSP at *Pages 126-128.*

h. Implementation Policies and Land Use Regulations

Implementation policies and land use regulations are discussed on *Pages 137-138* of the draft TSP.

i. A Transportation Financing Program

Pages 54-57 of the TSP contain a discussion of the transportation financing program

The Draft TSP contains all of the components required by OAR 660-012-0020.

2. Is anything in the TSP considered a mandatory criteria for land use decisions?

Some councilors have raised questions as to whether the various goals, objectives, and actions contained in the TSP are intended to be, or have the potential to be interpreted as, criteria for land use decisions.

In a 1989 court case, *Bennett v. Dallas*, the Oregon Court of Appeals held that a City's comprehensive plan policy which "encouraged" government offices to locate in the central business district was not a decisional standard for a land use application. The court agreed with the Land Use Board of Appeal's (LUBA) analysis that comprehensive plan polices may or may not be approval criteria applicable to a specific land use decision, depending on their context and how they are worded.

The Court affirmed LUBA's holding that local governments may or may not make it clear in their comprehensive plans how the plan goals and policies apply to specific land use decisions. Since in this case it was not clear whether the comprehensive plan policies at issue were meant to be land use criteria, LUBA reviewed their context and wording. The policy language was interspersed with comprehensive plan text and was written in very general, nonmandatory language. LUBA held that "although the plan policies could have been made clearer," they expressed a "general framework and general principles" which "guided" the city's land use regulations.

Using the *Bennet* case as guidance, it is up to the City Council to decide whether any of the goals, objectives, or action items in the TSP will be used as land use criteria. Other cities have included language in their TSP's indicating whether the policies and standards are to be used as land use criteria.

For example, the City of Eugene's TSP says:

> The *2035 TSP* provides a flexible, adaptable framework for making transportation decisions in an increasingly unpredictable and financially constrained future. Decisions about the City of Eugene's transportation system will be guided by the goals and policies contained in Chapter 2, but ultimately the decisions will be made within the overall context of the City's land use plans, commitments to address climate recovery, and support for economic vitality. These guiding plans and principles, described in the following sections provide a long-standing foundation for the *2035 TSP's* goals, policies, and potential actions.

In a later footnote, the intent is spelled out even more explicitly:

> As discussed at the beginning of Chapter 2, the *2035 TSP* is an internally-directed document that provides a coordinated guide for City's changes to its transportation infrastructure and operations over the next 20 years. The *2035 TSP* is not an externally-applicable document, *i.e.*, no part of the *2035 TSP* serves as a "requirement" to which land use (or other) applicants must demonstrate compliance and the City will not use the policies of the *2035 TSP* in determining whether to approve or deny individual land use applications.

Similarly, in *Trademark Construction v. Marion County* (1998), where Marion County denied a conditional use permit for a quarry operation, the Oregon Court of Appeals upheld the County's decision. The Court held that the recurring use of the word "guide" in the introductory section of the comprehensive plan did not make the entire plan nonmandatory. The comprehensive plan stated:

> It is important to understand that because this plan is intended to serve as a guide to future development, more specific actions and programs must be undertaken to implement the goals and plans. A distinction between the comprehensive plan and implementing measures such as zooming, subdivision codes, public land acquisitions, taxing policies, and public improvements must be understood. Implementing measures are specific and separate actions. This plan is not a zoning ordinance, but a guide to future development.

The comprehensive plan contained provisions discussing the nature of the existing quarry site, including a provision stating that rock removal at the quarry site should be limited due to its proximity to residential areas.

In denying the CUP for the quarry, the County found that the CUP application was not consistent with the comprehensive plan because it proposed to significantly increase the amount of rock to be removed, and proposed additional activities at the quarry site that would have more negative impacts on nearby residential areas, such as blasting, crushing, and washing.

The Court held that neither the language of the comprehensive plan itself nor any extrinsic data led to the conclusion that any part of the comprehensive plan served an *exclusively* advisory function. The fact that the plan was more general than the zoning code and served as a guide for the substance of that zoning code did not mean that parts of the plan could also be mandatory.

In light of the holdings in the *Bennett* and *Marion County* cases, if the Medford City Council intends for parts of the TSP to be general guidance and parts of it to be specific mandatory standards to be applied to future land use decisions, then the Council should clearly articulate its intent in the motion and findings adopting the TSP.

Some items which the Council may want to consider making mandatory are the street functional classification and the street cross sections. Other items that the Council may desire to make mandatory can be found in the "Action Item" sections of Section 2 (Goals and Objectives) of the TSP. Most of the Action Items are worded to be very discretionary and to be used as general guidance, but the Council may want to identify any Action Items that they definitely want to be implemented.

For example, Action Item 4-b under Objective 4 lends itself to being a mandatory standard ("Ensure development throughout the City . . . [is] consistent with the Functional Classification plan and other planned transportation improvements.") *Page 11 of the TSP.*

Another Objective that could be made mandatory is Objective 9-b, which states that before a street classification in residential and mixed-use areas is upgraded to a higher order classification, the impacts to neighbor livability will be considered. *Page 12 of the TSP.*

Carla:

Thank you for speaking to me earlier today by phone regarding this matter.

As discussed, the City of Medford has contracted with CSA Planning, Ltd. to coordinate a site development plan for a 6.2 acre area located on a larger property owned by Jackson County (Airport Authority). The airport land is generally located between Corona Avenue and Whittle Avenue south of Skypark Drive and is zoned I-L in the Airport Approach Overlay. The lease site is located on the northwesterly portion of the larger airport tract along the Corona Avenue frontage. Attached is a legal description and map of the lease site from the lease agreement (Exhibit A thereto) and an assessment map of the general area. Also attached is a copy of the Council Bill report (Item 80.6 of September 7, 2017 City Council Agenda) which explains the purpose and import of this area as a satellite site for Public Works on the east side of the Bear Creek and the freeway.

The draft TSP shows three future street connections through the Airport Authority property, two of which would affect the City's lease site for the needed Public Works facility. Those two connections are identified in Table 23 and on Figure 23 in the draft TSP a Project Numbers L11 (Hilton Road extension to Whittle Avenue) and L12 (Patrick Street Connection to Corona Avenue). The L11 Hilton Road extension would abut the south boundary of the lease area and the L12 Patrick Street Connection would bisect the leased Public Works facility site right through its center. The L12 Patrick Street Connection is of greatest concern to the project. The Public Works facility needs to be a fully secured site and, at only six acres, it is a much smaller site than the existing Public Works facility on the west side of the city. The loss of area that would be needed to provide for the future public street connection – and the additional front setback areas that would thereby also need to be added – will take away area that is intended to accommodate other important City needs.

I understand that the related text at page 131 of the draft plan provides some flexibility to modify the specific alignments dependent upon future development review. However, the map and table do show three separate connections though the airport property and the Project Number Names seem to be quite specific about where the connections are intended to be accommodated (and constructed by future development as per the narrative on page 131). I recommend that the City consider removing the L12 Patrick Street Connection to Corona Drive in consideration of the extensive time and effort that it has already committed to securing this lease from Jackson County and as approved by the City Council through Ordinance 2017-106. Additionally, the following should be considered:

- Both Projects L11 and L12 for the Hilton Road and Patrick Street Connections would be routed directly through Locally Significant Wetland No. BE-W01 (a vernal pools complex) on the eastern portion of the airport property (east of the Hopkins Canal) as depicted on the City's September 2002 Local Wetland Inventory (Map 2, attached). There really is no way to avoid the wetland for any connection to Patrick Street. The Hilton Road extension could avoid the wetland if routed southeasterly to link up with Grandview Avenue. Connection L13 (Grandview to Steelhead Run) could tie-in with the Hilton Road connection as an alternative to the draft plan.

- The Maximum Block Length standard for Industrial Zones is 940 feet pursuant to MLDC Table 10.426-1. The Patrick Street and Hilton Road Connections are only about 330-feet apart as shown in Draft TSP Figure 23 – or the equivalent of the short block face in a City Center traditional grid (330' X 660'). Given the context of the industrial zoning, eliminating the Patrick Street Connection

altogether and rerouting the Hilton Road to a southeasterly course to Whittle/Grandview would be an appropriate change that would still improve connectivity for the area.

- The City should recognize that funding of street construction by development, in this case, means funding by the City which should be budgeted accordingly.

Please let me know if you have any questions or need any further information.

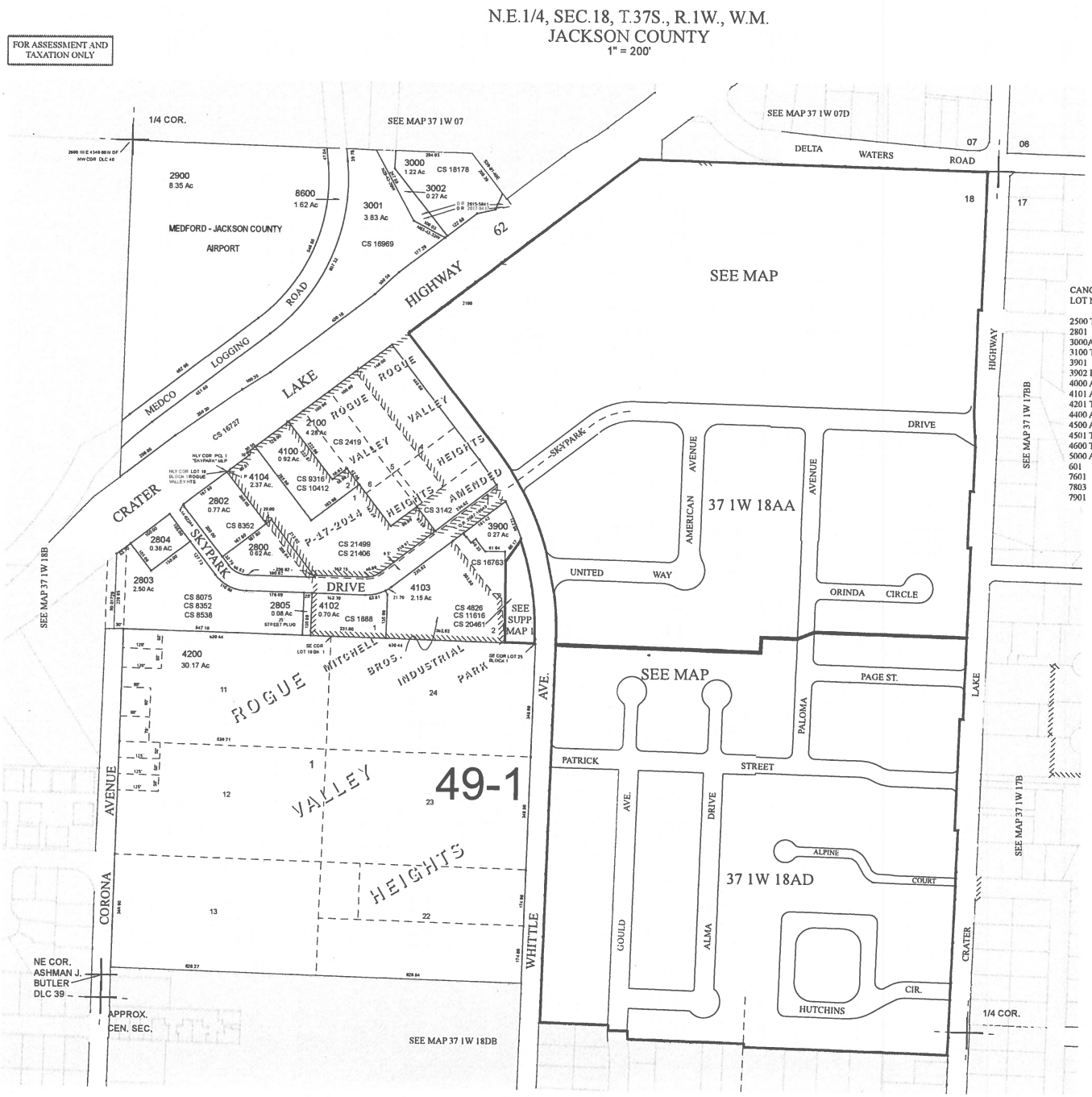
Very truly yours,

CSA Planning, Ltd.
Raul Woerner

(541) 779-0569

Attachments to e-mail include:
-Exhibit A to City of Medford lease
-Ordinance 2017_106 ground lease approval Corona Avenue
-371w18a
-Draft TSP text street connectivity page 131
-Draft TSP Figure 23 street connectivity
-Draft TSP Table 23 street connections
- LWI map 2

Exhibit O



GIS DATA
08/09/2017 10:47:48 AM : thompsam

EXHIBIT A

AIRPORT PROPERTY-SERVICE CENTER
JACKSON COUNTY
371W18A TL 4200
RW#7435

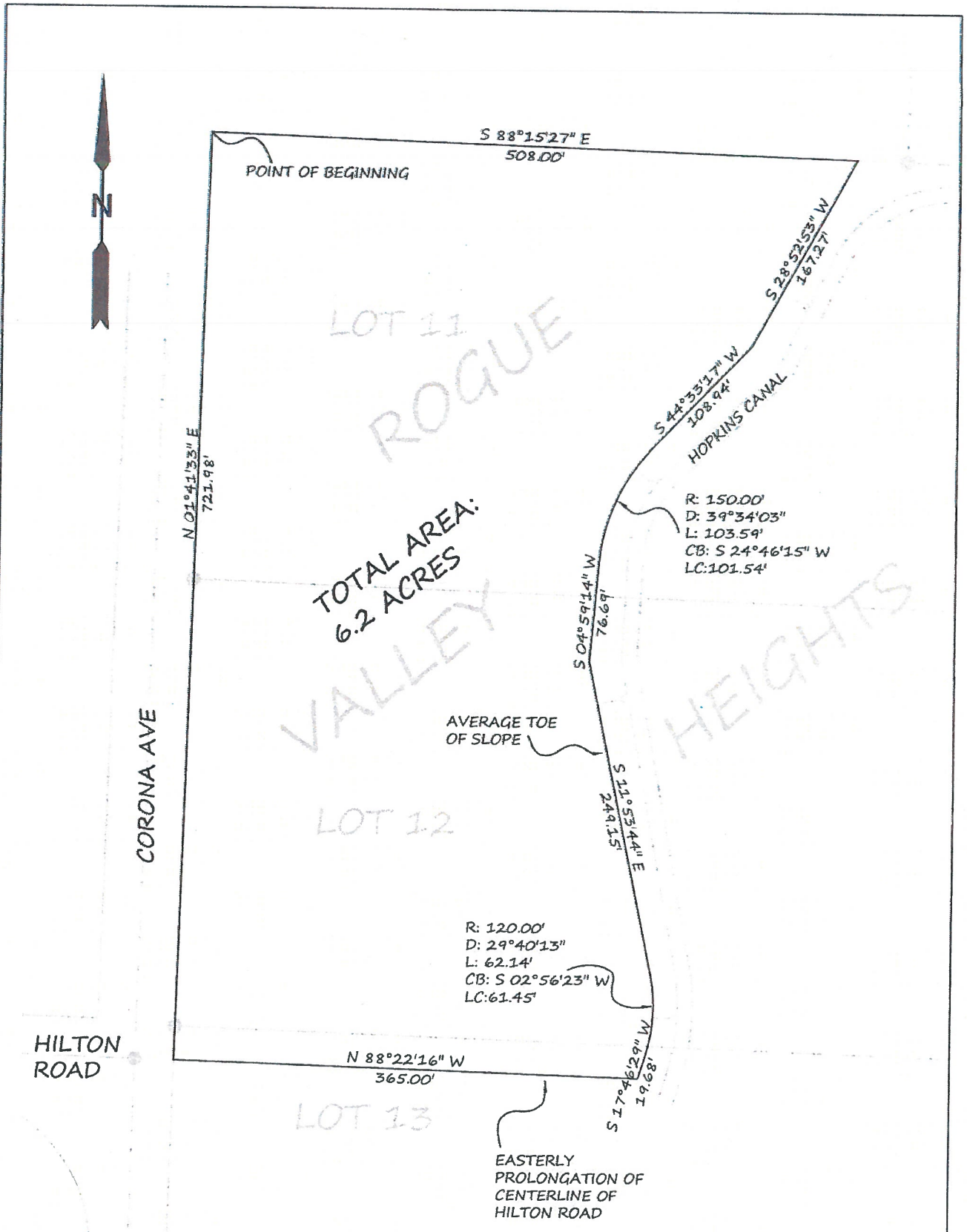
A TRACT OF LAND LYING IN THE NORTHEAST QUARTER OF SECTION 18, TOWNSHIP 37 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, JACKSON COUNTY, OREGON, BEING A PORTION OF THAT REAL PROPERTY DESCRIBED IN LOTS 11, 12, AND 13 OF ROGUE VALLEY HEIGHTS, RECORDED AS VOLUME 6 PAGE 42 OF PLATS RECORDS OF JACKSON COUNTY OREGON; SAID TRACT BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF LOT 11 OF PLAT ROGUE VALLEY HEIGHTS, THENCE ALONG THE NORTH LINE OF SAID LOT SOUTH 88°15'27" EAST A DISTANCE OF 508.00 FEET; THENCE LEAVING SAID NORTH LINE SOUTH 28°52'53" WEST A DISTANCE OF 167.27 FEET; THENCE GENERALLY ALONG THE WESTERLY TOE OF SLOPE OF HOPKINS CANAL FOR THE FOLLOWING SIX COURSES AND DISTANCES; SOUTH 44°33'17" WEST A DISTANCE OF 108.94 FEET; THENCE ALONG A 150.00 FOOT RADIUS CURVE TO THE LEFT (THE CHORD WHICH BEARS SOUTH 24°46'15" WEST A DISTANCE OF 101.54 FEET) AN ARC DISTANCE OF 103.59 FEET; THENCE SOUTH 04°59'14" WEST A DISTANCE OF 76.69 FEET; THENCE SOUTH 11°53'44" EAST A DISTANCE OF 249.15 FEET; THENCE ALONG A 120.00 FOOT RADIUS CURVE TO THE RIGHT (THE CHORD WHICH BEARS SOUTH 02°56'23" WEST A DISTANCE OF 61.45 FEET) AN ARC DISTANCE OF 62.14 FEET; THENCE SOUTH 17°46'29" WEST A DISTANCE OF 19.68 FEET TO A POINT BEING ON THE EASTERLY PROLONGATION OF THE CENTERLINE OF HILTON ROAD; THENCE LEAVING SAID TOE OF SLOPE, ALONG THE EASTERLY PROLONGATION OF THE CENTERLINE OF HILTON ROAD NORTH 88°22'16" WEST A DISTANCE OF 365.00 FEET TO THE WEST LINE OF LOT 13 OF ROGUE VALLEY HEIGHTS SUBDIVISION BEING THE EASTERLY RIGHT OF WAY OF CORONA AVE; THENCE NORTHERLY ALONG THE WEST LINE OF SAID SUBDIVISION NORTH 01°41'33" EAST A DISTANCE OF 721.98 FEET TO THE POINT OF BEGINNING.

THIS TRACT OF LAND TO WHICH THIS DESCRIPTION APPLIES CONTAINS 6.2 ACRES MORE OR LESS

BEARINGS BASED ON OREGON STATE PLANE SYSTEM SOUTH ZONE NAD 83/2011

THE GRAPHIC DEPICTION OF THE ABOVE DESCRIPTION IS SHOWN ON EXHIBIT "B" ATTACHED HERETO



REGISTERED
PROFESSIONAL

Traffic Signal Spacing

Traffic signals that are spaced too closely on a corridor can result in poor operating conditions and safety issues due to the lack of adequate storage for vehicle queuing. The City's traffic signal spacing standard is 1,320 feet per Medford Municipal Code 10.463. Traffic signals should only be implemented when warranted to enhance safety and promote mobility. ODOT identifies half mile as the desirable spacing of signalized intersections on regional and statewide highways but recognizes that shorter signal spacing may be appropriate due to a number of factors including existing road layout and land use patterns[6]. Signal spacing below ODOT or City standards should be studied in detail to consider traffic signal coordination and the impacts of vehicle flow, queuing, and safety within the area. At that time adjacent signals and the spacing between them can be evaluated.

Street Connectivity

Many of the residential neighborhoods in Medford are served by a network of cul-de-sacs and dead end streets. These streets can be desirable to residents because they can limit traffic speeds and volumes on local streets, but cul-de-sacs and dead end streets result in longer trip distances, increased reliance on arterials for local trips, and limited options for people to walk and bike to the places they want to go. By providing connectivity between neighborhoods, out-of-direction travel and vehicle miles traveled (VMT) will be reduced, congestion will be improved on roads such as N Phoenix Rd, E Barnett Rd, Crater Lake Ave, Table Rock Rd. Additionally, improved connectivity will reduce public safety-response time.

The City's standards for street connectivity and maximum block length are identified in Medford Municipal Code 10.426 and they help ensure that future development results in well-connected streets. Incremental improvements to the street system are planned to provide route choices for motorists, bicyclists and pedestrians while accounting for potential neighborhood impacts. The quality of the transportation system is enhanced by making connectivity improvements to the pedestrian and bicycle system separate from street connectivity.

Figure 23 and Table 23 identify locations and conceptual alignments of potential future local street connections. These do not represent all future local streets but identify locations where there is a lack of connectivity in an existing network that needs to be addressed by the City or through future development. In limited cases, a short length of new road would be necessary for improved connectivity. In most cases, potential local street and neighborhood route connections represent streets to be constructed by future development and extension of existing stub end streets. Pedestrian connections from any cul-de-sac should be considered as future development and redevelopment occurs. The goal is to continue to improve connectivity for all modes of transportation. In each case, the specific alignments may be modified dependent upon future development review.

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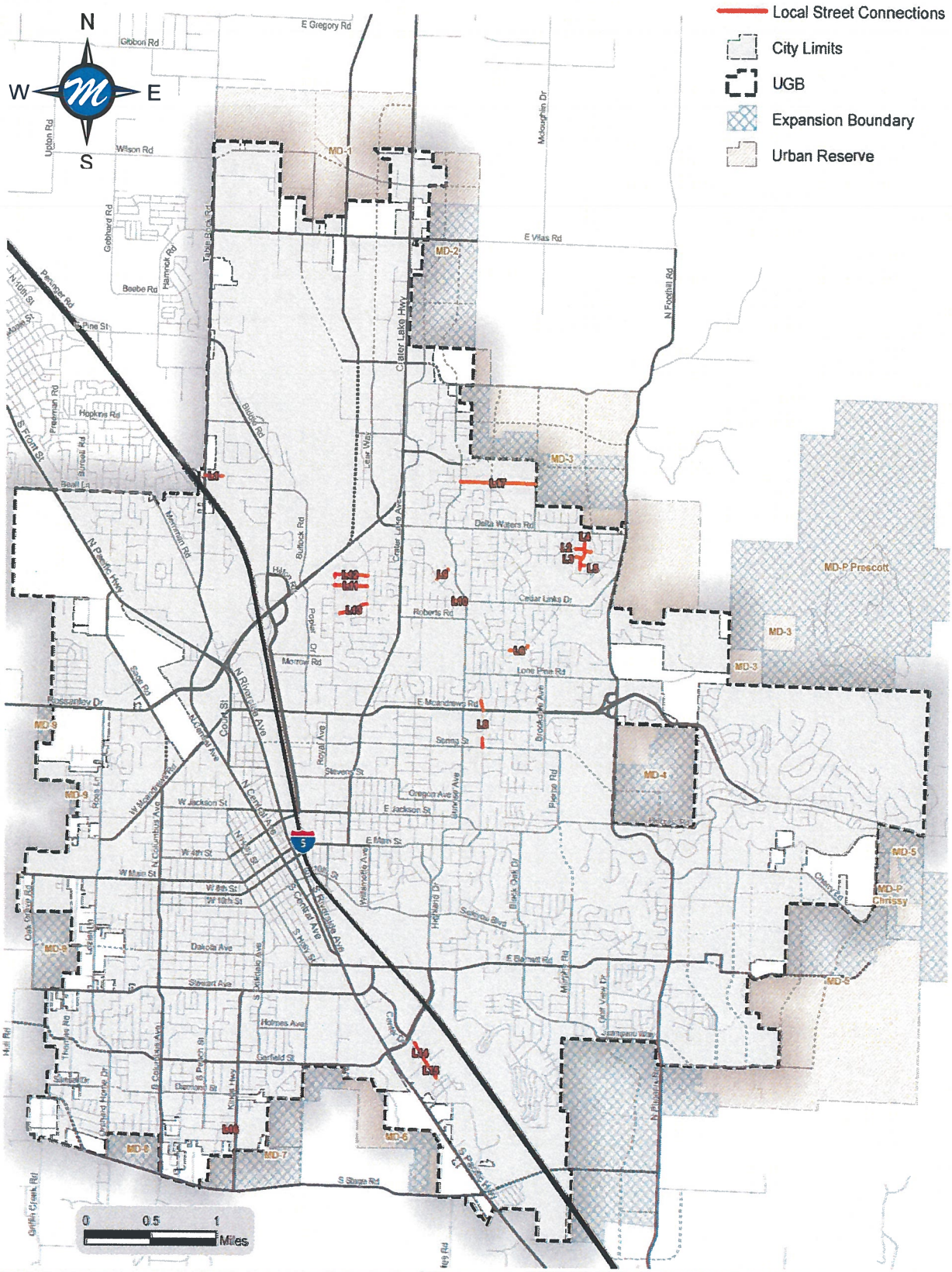
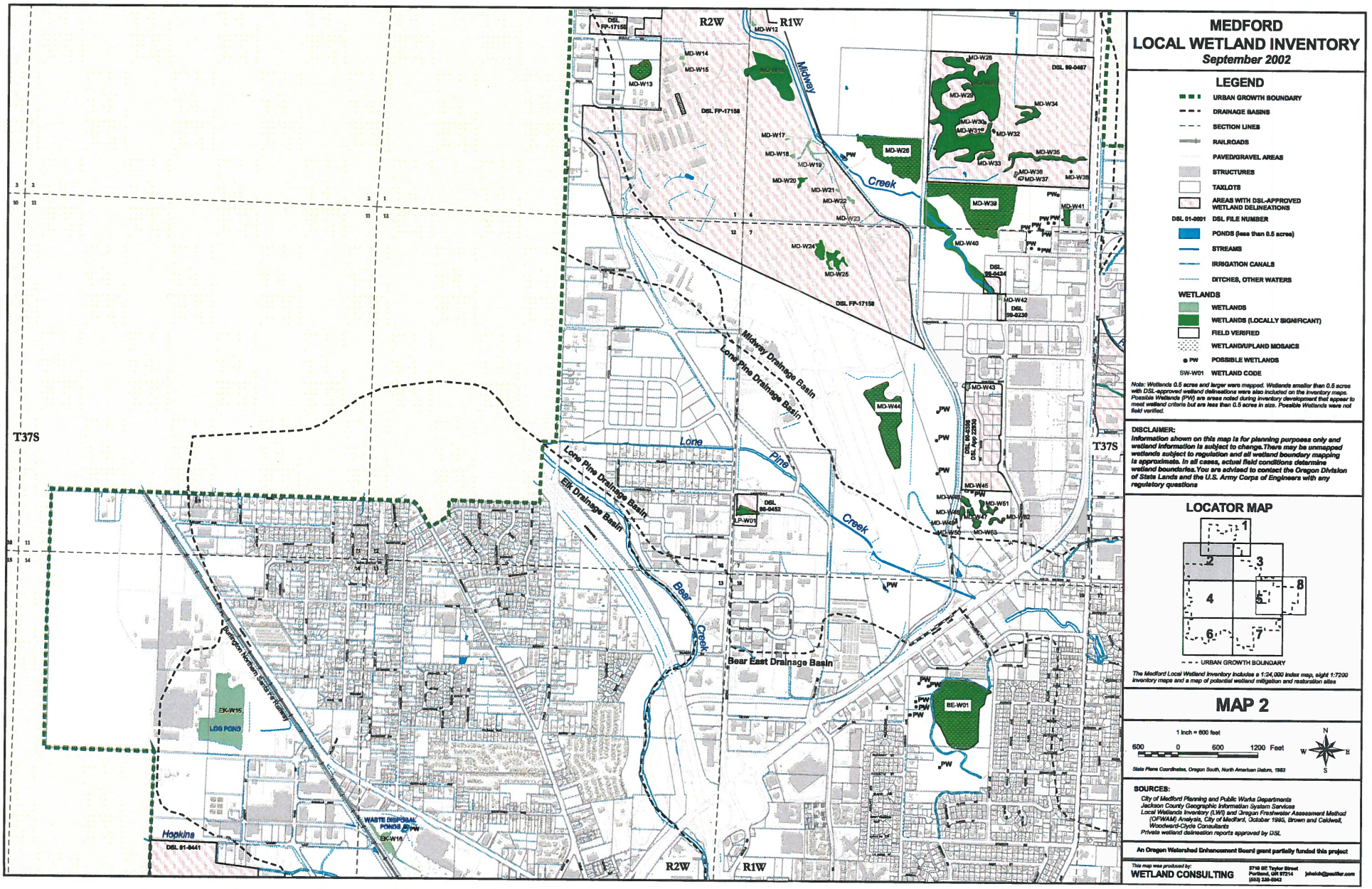
[6] MUTCD signal warrants must be met based on ODOT methodology and OAR 734-020-460 (1) A traffic signal shall not be installed unless one or more of the warrants identified in the MUTCD are met or will be met consistent with the requirements of OAR 734-020-0490. The satisfaction of a warrant or warrants, however, is not in itself justification for a traffic signal. Installation of a signal must be approved by the State Traffic Engineer on a regional or state highway.

Table 23 Street Connections

Project Number	Name	Type
L1	Gilman Road Extension to Table Rock	Local Street
L2	Viewpoint Dr Extension to Tiffany Street Extension	Local Street
L3	Bryson Way Extenstion to Tiffany Street Extension	Local Street
L4	Tiffany Street Extension to Augustine Drive	Local Street
L5	Wheatridge Extension to Tiffany Street Extension	Local Street
L6	Wilkshire Rd to Roberts Dr Connection	Local Street
L7	Murphy Rd extension from Country Club Drive to Hillcrest Rd.	Local Street
L8	Valley View Drive extensions to McAndrews Road and to Spring Street	Local Street
L9	Bell Court connection to Temple Drive at Montelimar Drive	Local Street
L10	Cedar Links Dr extension to Perri Pl through residential	Local Street
L11	Hilton Road extension to Whittle Avenue	Local Street
L12	Patrick Street extension to Corona Avenue	Local Street
L13	Grandview Avenue extension to Steelhead Run	Local Street
L14	Center Drive extension to Charlotte Ann Road	Local Street
L15	Highgate Street extension to Charlotte Ann Road	Local Street
L16	Archer Drive extension to Kings Highway	Local Street
L17	Ford Drive, Springbrook Road to eastern UGB	Local Street

Figure 23 Street Connectivity




MEDFORD
LOCAL WETLAND INVENTORY
September 2002
LEGEND
URBAN GROWTH BOUNDARY
DRAINAGE BASINS
SECTION LINES
RAILROADS
PAVED/GRAVEL AREAS
STRUCTURES
TAXLOTS
AREAS WITH DSL-APPROVED WETLAND DELINEATIONS
DSL 01-0001 DSL FILE NUMBER
PONDS (less than 0.5 acres)
STREAMS
IRRIGATION CANALS
DITCHES, OTHER WATERS
WETLANDS
WETLANDS
WETLANDS (LOCALLY SIGNIFICANT)
FIELD VERIFIED
WETLAND/UPLAND MOSAICS
PW POSSIBLE WETLANDS
SW-W01 WETLAND CODE
Note: Wetlands 0.5 acres and larger were mapped. Wetlands smaller than 0.5 acres with DSL-approved wetland delineations were also included on the inventory maps. Possible Wetlands (PW) are areas noted during inventory development that appear to meet wetland criteria but are less than 0.5 acres in size. Possible Wetlands were not field verified.
DISCLAIMER:
Information shown on this map is for planning purposes only and wetland information is subject to change. There may be unmapped wetlands subject to regulation and all wetland boundary mapping is approximate. In all cases, actual field conditions determine wetland boundaries. You are advised to contact the Oregon Division of State Lands and the U.S. Army Corps of Engineers with any regulatory questions
LOCATOR MAP
URBAN GROWTH BOUNDARY
The Medford Local Wetland Inventory includes a 1:24,000 index map, eight 1:7200 inventory maps and a map of potential wetland mitigation and restoration sites
MAP 2
1 inch = 600 feet
600 0 600 1200 Feet
State Plane Coordinates, Oregon South, North American Datum, 1983
SOURCES:
City of Medford Planning and Public Works Departments
Jackson County Geographic Information System Services
Local Wetlands Inventory (LWI) and Oregon Freshwater Assessment Method (OFWAM) Analysis, City of Medford, October 1995, Brown and Caldwell, Woodward-Clyde Consultants
Private wetland delineation reports approved by DSL
An Oregon Watershed Enhancement Board grant partially funded this project
This map was produced by:
WETLAND CONSULTING
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Portland, OR 97214
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jshalek@wetlnd.com
R2W
R1W
T37S
Midway
Creek
Lone Pine
Lone Pine Drainage Basin
Midway Drainage Basin
Elk Drainage Basin
Bear Creek
Bear East Drainage Basin
Burlington Northern Santa Fe Railway
Hopkins
DSL 01-0441
LOG POND
WASTE DISPOSAL PONDS
EK-W15
EK-W16
BE-W01
LP-W01
DSL FP-17158
DSL 99-0467
DSL 99-0434
DSL 99-0230
DSL 99-0452
DSL 94-2356
DSL App 22536

MEMORANDUM

Subject	Response to Siskiyou Velo Testimony
To	Mayor and City Council
From	Matt Brinkley and Carla Angeli Paladino
Date	October 18, 2018

SISKIYOU VELO COMMENTS

Testimony was received from Siskiyou Velo Bicycle Club prior to the Planning Commission hearing on October 11, 2018. The document identifies a number of Oregon Administrative Rules related to the Transportation Planning Rule and the Oregon Constitution that it claims are violated by the City's proposed Transportation System Plan (TSP).

The specific portions of the testimony are excerpted from Siskiyou Velo's (SV) document and inserted below in italics. Staff's rebuttal to the comments follow in roman type.

Introduction

SV Comment: Over the years, Medford has added many miles of bike lanes on its arterial and collector streets. Presumably, this was in response to OAR 660-12-0045(3)(b) which states "bikeways shall be required along arterials and major collectors" (emphasis added). The City, in contrast to the TPR requirement, has utilized bike lanes as a "one- size-fits-all" improvement ignoring other TPR requirements including OAR 600-12-0045(3)(d)(A), which requires that bike facilities (emphasis added) be "reasonably free from hazards, particularly types or levels of automobile traffic which would interfere with or discourage ... cycle travel for short trips."

Staff Response: The 2003 Transportation System Plan provided cross sections that included on-road bicycle facilities and such facilities have been installed on City streets. However, other forms of bicycle facilities including off-road multi-use paths such as Larson Creek have and continue to be constructed in order to provide dedicated active transportation alternatives to on-road facilities—especially in instances where automobile traffic volumes and speeds will not safely accommodate bicycle travel. The updated plan includes a new cross section for major and minor arterials that separates bicycle and vehicular traffic. The proposed plan favors looking at low volume streets (neighborhood bikeways) and other off-road facilities (multi-use paths and trail

connections) that are better suited to serve the less experienced and skilled bicyclists. It is recognized that these are generally safer as they spatially separate vehicles from bicycles (and pedestrian) traffic.

SV comment: *As a consequence of the City's policy, the existing bicycle transportation system is largely unusable by the majority of people who might otherwise choose to bicycle if the system were, as required by the TPR, "safe and convenient." A survey conducted by the City in August 2017 (Medford Transportation Survey, question 17) found that over 50% of residents ride bikes, but only about 6% feel safe and confident riding on city streets. The TSP – Update refers to these people as "strong and fearless" or "enthused and confident".*

Staff's response: The updated plan provides alternatives that were not considered in the 2003 plan. The survey responses capture perceptions of current conditions and are not an indictment of the types of facilities proposed by the TSP update. What has been the standard for bicycle facilities on the roadway is no longer the only or the preferred option for development of the system. The proposed TSP includes cross section alternatives that either buffer or separate the bicycle facilities from the vehicle lanes. The comment does not take into consideration proposed projects, legacy street standards, or multi-use path connections that will modify the system over the next planning period.

SV Comment: *Figure 1 (draft TSP, Figure 10) indicates level of stress (L or LTS) for existing bicycle facilities in Medford. Only Level 1 stress bike facilities, it should be noted, can be used by people of all ages and abilities. There are no existing collector or arterial streets shown on Figure 1 with L1 or L2 stress. There are future streets planned for Level 2 stress—generally, L2 stress facilities can accommodate most adults of ages 18-64.*

Staff's Response: The Level of Traffic Stress analysis was performed to assess how roadways compare using this diagnostic tool. It was not intended to suggest all streets need to achieve a particular level of stress ranking.

SV Comment: *All of the City's collector and arterial streets are either L3 or L4, which are considered unsafe for everyone. The current bicycle network on arterial and collector streets, then, completely excludes children, seniors and families. Analysis of Fig 1 also indicates that riding a bicycle from anywhere to anywhere in Medford is almost impossible on L1 stress facilities—thus excluding vast numbers of all people (including commuters, shoppers, people going to medical appointments, etc.) from riding safely and conveniently in Medford.*

Staff's Response: The above statement is a criticism of the existing bicycle network and does not acknowledge any of the steps being considered to modify that condition in order to serve a broader population. The proposed TSP would favor construction of separated and protected bicycle facilities in new parts of the City where transportation facilities will

be constructed as new development occurs. In existing parts of the City, the TSP provides guidance for the provision of facilities for bicyclists and pedestrians in situations where limited public right-of-way poses obstacles to the construction of transportation facilities that optimally serve all modes of transportation and all users.

SV Comment: *Further compounding the issue is the City's historic construction of overly narrow bike lanes on most of its arterial and collector streets.*

Staff's Response: In some locations, a narrower bike lane can be found on streets deemed legacy streets where right-of-way is limited and where competing interests must be weighed. This criticism is not an indictment of the proposed project list or the cross sections that provide buffered or off-road bicycle facilities. SV also errs in conflating infrequent application of narrower bike lanes widths with a formal policy that is routinely applied through the City.

SV Comment: *The TSP does call for a bicycle network that is safe for everyone (TSP--Update, Vision, Goal 1, Objective 1, 2, and 3 as examples). Yet, the draft TSP sets LTS 2, only suitable for adults, as the future standard for bicycle improvements.*

Staff's Response: Figure 13 identifies ways to improve the bicycle facilities to induce low stress connections throughout the community. As stated previously, new roadways will meet a LTS 1 standard by separating the bicycle facility from the vehicle lanes. The updated plan considers the bicycle facilities differently than it did the 2003 plan.

SV Comment: *It is also notable that there are no bike facility "safety" improvements listed in the TSP despite the City's acknowledgement that the existing bicycle transportation system is unsafe for the majority of its citizens. For existing bicycle safety deficiencies, the draft TSP update merely states that these "will be considered when improving or retrofitting roadways" (TSP--Update, page 34).*

Staff's Response: The bicycle improvements must be reviewed holistically in the plan rather than through one specific sentence. As mentioned, new roadways will be able to accomplish LTS 1 through the new cross sections that separate the bicycle facility from the vehicle lanes. LTS will be improved as legacy streets are redeveloped or reconstructed either through corridor studies that evaluate a change to the cross section or expanding right-of-way to create multi-use paths along streets that lack on-road bicycle lanes.

Failure 1

SV Comment: *OAR 660-012-0035 subsection (7) Evaluation and Selection of Transportation System Alternatives requires: "Regional and local TSPs shall include benchmarks to assure satisfactory progress towards meeting the approved standard or standards adopted pursuant to this rule at regular intervals over the planning period.*

MPOs and local governments shall evaluate progress in meeting benchmarks at each update of the regional transportation plan. Where benchmarks are not met, the relevant TSP shall be amended to include new or additional efforts adequate to meet the requirements of this rule."

The table below details the Rogue Valley Metropolitan Area's failure to meet the adopted "Measure 1" benchmark - "the percentage of total daily trips taken by a combination of bicycle and walking (non-motorized) modes..." The percentage of bike/pedestrian mode share has remained unchanged since the year 2000 at 8.2 percent, and the transit mode share is lagging behind its 2015 benchmark.

Staff's Response: The Rogue Valley Metropolitan Planning Organization evaluates and tracks the progress of the alternative measures benchmarks that affect more than just the City of Medford. The plan provides projects and goals and objectives that will help improve these modes within the City over time; however, the City of Medford cannot be held accountable for the current condition of the entire region's bicycle network.

SV Comment: A 2017 update and review of the 2015 benchmark analysis found errors in the 2014 analysis. "Results of this analysis show that 28% of arterials and collectors within the RVMPO have facilities for bicyclists that meet the criteria described above. This number is below the 2015 benchmark of 48%." (4/20/18 email and attachment, Andrea Napoli, RVMPO – available upon request). The draft TSP does not include this updated information.

Staff's Response: The initial 2000 Baseline measurement was likely also flawed, thereby creating an unrealistic goal for Measure #3. The RVMPO Technical Advisory Committee has discussed the limitations and inaccuracies of the previous methodology for assessing this particular measure, and both the measurement methodology and goal will need to be reconsidered.

SV neglects to mention that the proposed plan includes approximately 15 miles of new arterial and collector improvements over the planning period. In addition, funding is allocated for both sidewalk and bicycle facility improvements annually to improve connections and install facilities on roadways or alternate routes.

Finally, the Alternative Measures represent a regional commitment and not the obligation of any one jurisdiction alone. SV implies that Medford is solely responsible for meeting this obligation and that conclusion is erroneous.

SV Comment: Recent data shows that Medford residents are becoming more dependent upon the use of automobiles to get to work based upon recent statistics from the US Census Bureau, American Community Survey. In 2010, 77.8 of Medford residents drove alone to work while in 2016 the number had increased to 78.8 of all workers.

Staff's Response: The alternative measures benchmarks are a regional requirement. A comparison of Medford's share of that benchmark would be needed in order gauge how the community is helping or hindering with this regional effort. In fact, growth in outlying communities (Eagle Point, Central Point, Talent, etc.) has generated additional automobile usage as residents in these communities travel to and from Medford in greater numbers in order to access services, employment, etc. To conclude, as SV does, that Medford's past transportation investment decisions have somehow increased the number of regional Single Occupant Vehicle trips to and from work ignores a number of other factors including regional land use and development patterns that have shifted residential growth from Medford (particularly its core urban areas) to outlying communities that are not adequately connected to Medford by bicycle facilities or public transportation service.

SV Comment: Portland, as a frame of reference, has increased bicycle mode share from one percent (the historic and existing mode share for bicycles in Medford) in 1990 to 6.1 percent in 2010 by constructing a combination of off-street trails, bike boulevards, and separated in-roadway bicycle facilities. Portland's TSP provides for a 25% bike mode share by 2035. (See Exhibit 2, attached).

Staff's Response: It took Portland 20 years to increase its mode share by 5%, and Portland continues to have hundreds of miles of roads that do not have any dedicated bicycle facilities. Portland, furthermore, has also deployed on-road bicycle facilities (bike lanes) on many of its streets. The proposed TSP does not identify a percentage target for bike mode share. However, as stated previously, new cross sections, additional annual funding for bicycle infrastructure, new multi-use path installations, and retrofitting legacy streets will increase the community's ability to use a bicycle in the City.

SV Comment: An unrealistically low alternative mode share translates into a higher overall need for roadway and intersection improvements. Consequently, the transportation needs and "demand-to-capacity ratios ... included in Volume II of the TSP" (draft TSP, page 23) are overstated and result in more roadway improvements than necessary. "Transportation Needs" as the term is used in the TPR "means estimates of the movement of people and goods consistent with acknowledged comprehensive plan and the requirements of this rule. Needs are typically based on projections of future travel demand resulting from a continuation of current trends as modified by policy objectives, including those expressed in Goal 12 and this rule, especially those for avoiding principal reliance on any one mode of transportation." (emphasis added) The absurdly low alternative mode share, as expressed in Measure 1, is a policy objective and makes the travel demand forecasts developed as a part of the draft TSP of questionable value.

Staff's Response: This information is not quantified and SV fails to provide any quantitative analysis that would substantiate how much of a change in mode split would

be more appropriate and positively affect modeling outcomes. The modeling conducted for the City was based on a robust population growth scenario and a mode split that favors active transportation and transit. The improvements proposed to new roadways (new cross sections) are in favor of SV's request to serve all users.

SV Conclusions:

Conclusion 1a: The updated TSP does not satisfy the requirements of OAR 660-012-0035(4). The City's TSP presents the existing benchmarks but does not acknowledge that they have not been met, nor does the City offer updated benchmarks to achieve the requirements of the TPR a requirement of OAR 660-12-0035(7)..

Conclusion 1b: The existing Measure 1 objectives are far too low to achieve the requirement of OAR 660-12-0035(4). A modest and achievable goal bike mode share in 2038 would be 10 percent.

Conclusion 1c: The local Measure 1 benchmark as adopted, even if achieved, would not significantly reduce reliance on the automobile. The combined pedestrian and bicycle mode share should be above 20 percent to achieve the requirements of the TPR, especially the requirement to achieve "a reduction in reliance on single occupant automobile use." (OAR 660-12-0000(3)c). Based upon the experience of other areas that have constructed "all ages and abilities" bicycle networks, a bike mode share in Medford can easily achieve 10 percent (see Exhibit 3) provided the bicycle network is "safe and convenient."

Staff's Conclusion: The plan does acknowledge the regional alternative measures benchmarks. The benchmarks call for an 11% bike/pedestrian mode share by 2020. These were adopted targets that were acknowledged by the State. It is unclear how the 20 percent mode share number is justified or where it is required for the City to set such a standard.

Failure 2

SV Comment: The draft plan does not conform to the requirements of OAR 660-12-0045(3)(d)(A) in that the proposed street designs (TSP, Exhibits 2 – 13, pages 56 – 67) include bicycle facility designs that would not be "reasonably free from hazards, particularly types or levels of automobile traffic which would interfere with or discourage … cycle travel for short trips."

The draft plan includes street cross-sections that would be unsafe for most people riding bicycles. All Ages and Abilities Bicycle Designs, (included by reference - https://nacto.org/wp-content/uploads/2017/12/NACTO_Designing-for-All-Ages-Abilities.pdf) a publication by the National Association of City Transportation Officials, NACTO. As the title implies, the NACTO document details bicycle designs suitable for

everyone (not just adults). It embodies the TPR's requirement for "safe and convenient" bicycle network through a variety of bicycle facility designs that vary based upon traffic volumes and speeds. That integration is essential to meet the requirements of The NACTO design manual includes facility designs for neighborhoods, parkways, bike paths, as well as high speed, high volume roadways which, when combined, would create a bicycle network that will "meet(s) travel needs of bicyclists considering destination and length of trip" a requirement of OAR 660-12-0045(3)(d)(C).

Staff's Response: The NACTO design manual was published in December 2017 which is a guidebook to help jurisdictions evaluate bicycle facilities. The manual does not indicate these facilities must be universal throughout the community but rather a network is needed to provide these facilities in a strategic and effective manner. SV fails to evaluate the proposed project list and other relevant changes and explain why the plan will fail to address these concerns. SV neglects to acknowledge the TSP is a new starting point for future improvements to the City's active transportation system and public transportation service. Both issues are being addressed through the City's involvement in the Rogue Valley Transportation District's system plan update and as well as the development of a regional active transportation plan.

SV Comment: Yet, only two of the City's 12 proposed roadway cross-sections include separation of bicycle traffic from high speed, high volume traffic.

Staff's Response: Yes, the major and minor arterials only include cross sections that provide a separated facility for bicycles. The other higher order cross sections do, however, include facilities for bicycles, and based on other factors such as speeds, may not require separation. On lower speed, lower volume streets, non-buffered bike lanes create opportunities for neighborhood bikeways. These types of streets may not support bicyclists of all ages and abilities, they would meet the needs of more experienced cyclists. A connected network of bicycle facilities is also important and can serve the community just as effectively.

Failure 3 & 4

SV Comment: Yet, the City's TSP does not include a specific commitment to make the bicycle system safe. That is in contrast with the motor vehicle system which is largely safe with notable exceptions. The street network poses safety problems for automobile drivers where they are most frequently concentrated at high volume intersections (where the risk of serious injury or death are lower – due to relatively low speeds). In contrast, the safety problems of the existing bicycle network are endemic and, as the TSP's review of accident data show, 97% of all cycling crashes result in injury. There aren't any on-street bicycle facilities in the City that are safe for everyone (LTS 1).

The TPR has required this outcome since 1991. Achieving it, over the course of what will be almost 50 years (at the end of the draft TSP's planning horizon), should be assured but the draft TSP falls woefully short and fails even to ensure that the bicycle system will be "safe and convenient."

Conclusion 3a: The City has failed to achieve the requirements of the OAR 660-12-0045(3)(d)) and has, inadvertently but systematically, created a bicycle network that is unsafe, and largely unusable by Medford residents. The draft plan fails to acknowledge that fact nor attempt to remedy that failure.

Conclusion 3b: The draft TSP does not include specific strategies, designs or adequate funding to ensure that the bicycle network conforms to the requirements of OAR 660-12-0045(3) by 2038, the end of the draft TSP's planning horizon.

Conclusion 4a: The draft TSP bicycle transportation network will not be "safe and convenient" and will not provide "reasonably direct routes of travel between residential neighborhoods and "destinations for people using bikes." In fact, the proposed network will include entire areas of the City that will be unsuitable for most bicycle travel by most city residents. The draft TSP does not satisfy the requirements of 660-12-0045(3)(d)(B).

Staff's Response: The updated TSP seeks to change the direction of how bicycle facilities within the City are installed and considered through new cross sections, annual funding allocations (at $100,000) for bicycle facilities, and retrofitting existing streets to provide for off-road facilities in locations where on-road facilities are impractical or undesirable. SV comments do not recognize the shift in strategy to look at bicycle facilities as more than a one size fits all approach as was done under the 2003 plan. One of the action items is to develop a bicycle and pedestrian plan for the City to focus in on the details related to better connections, prioritized improvements, and improving the bicycle facilities throughout the community.

Failure 5

SV Conclusions:

Conclusion 5a: The City's determination of which streets can be shared-use are arbitrary and not based upon current standards. Therefore, the potential for these roads to serve in that capacity and, ultimately, to help meet the travel needs of people riding bicycles is overstated. The draft TSP should rely upon the current research as described in the NACTO, Designing for All Ages and Abilities and NACTO's bicycle facility design standards.

Conclusion 5b: Several of the City's "activity centers" (see draft TSP, Figure 7) will be poorly served or not served with "safe and convenient" bicycle facilities, thus frustrating their very purpose; to foster a more transportation- efficient land use pattern. Consequently,

the bicycle travel needs of people living in these areas will be unmet, and the City's reliance upon "activity centers" to the meet the TPR's purpose (and Alternative Measures) will not be realized.

Conclusion 5c: The draft TSP proposed future transportation network and associated cross-section designs, taken together, will not meet the travel needs of bicyclists considering destination and length of trip" a requirement of OAR 660-12-0045(3)(d)(C).

Staff's Response:

The TSP includes a bicycle specific plan in Figure 21. This maps identifies proposed projects needed to reduce bicycle LTS and provide bicycle facilities on existing roads and construct new facilities throughout the City. Projects are further described in tabular format throughout Section 5 and include dedicated bike/ped multi-use paths that achieve LTS 1. These projects could be further developed as the City prepares bicycle and pedestrian facility plans in the future and participates in Jackson County's Active Transportation Plan.

SV does not identify which "activity centers" would be "poorly served" by bicycle facilities. Existing Activity Centers are largely built out, and retrofitting existing streets to include bicycle facilities in instances where they do not currently exist will be challenging. For this reason, the proposed TSP promotes flexibility and innovation in facility design. New Activity Centers, on the other hand, will be served by new streets that meet preferred low stress cross sections.

Concerning "neighborhood bikeways", SV asserts that "typical volumes and speeds on Standard Residential streets are low enough to accommodate shared use of travel lanes", and then claims that "Standard Residential streets have volumes in the neighborhood of 2,500 vehicles with posted speeds of 25 MPH but actual speeds typically approach or exceed 30 MPH". Staff concede that some motorists may exceed posted speed limits, but the claims made concerning traffic volumes on neighborhood streets are not documented by SV and seem unreasonably high when compared with known traffic counts and modeled traffic volumes. When considering appropriate design for these facilities in the future, the City will consider factors identified in NACTO manual including observed speed and observed traffic volume. To imply, however, as SV does that all of these facilities are inadequate and require additional traffic management interventions is, at best, premature, and conclusory.

Failure 6

SV Conclusions: Conclusion 6a: The draft TSP does [not provide] *the detail required under OAR 660-12-0035(4) – (6) in the "needed roadway projects" listing to determine the merit*

of individual projects or the degree to which each project conforms to the requirements of the TPR in particular OAR 660-12-0035(3)(d).

Staff's Response:

OAR 660-12-0035(4)-(6) are related to standards for "increasing transportation choices and reducing reliance on the automobile." SV claims that the project list and, presumably, Section 5 of the TSP fail to provide sufficient detail to determine compliance with these requirements. Staff respectfully disagrees and suggests that SV more closely consider Section 5 in its entirety. See response to "Failure 9" below for a more detailed response.

Failure 7

SV Conclusions:

Conclusion 7a: The draft TSP legacy street policy undermines the objectives of the TPR to reduce reliance upon motor vehicle travel, and to promote and encourage the use of alternative transportation modes.

Conclusion 7b: The legacy street policy, by limiting development of bike facilities on existing streets, conflicts with the requirements of OAR 660-12-0045.

Staff's Response: The legacy street policy does not undermine the objectives of the TPR. This policy will help to ensure missing facilities on roadways, including bicycle facilities, will be addressed either through consideration of a parallel but separate street network, a multi-use path such as Larson Creek, or retrofitting existing right-of-way to include a fourteen foot wide multi-use path on streets historically lacking bicycle facilities and that likely are not safe or convenient to serve bicyclists. Rather than ignoring the built environment and deciding that the existing conditions are good enough, the legacy street policy takes into consideration missing facilities and determines a path forward to accommodate it.

Failure 8

SV Conclusions:

Conclusion 8a: The draft TSP does not contain an accurate inventory of existing bicycle facilities required by OAR 660-12-0020(3)(d) which requires "an inventory and general assessment of existing and committed transportation facilities and services by function, type, capacity and condition."

Conclusion 8b: The lack of an inventory has led to the draft plan not addressing existing capacity issues on the Bear Creek Greenway in the central part of the City.

Staff's Response: The existing bicycle facilities are shown in Figure 11 in the plan while Figure 13 identifies the improvement needs for the facilities. This information provides an inventory and general assessment of the facilities throughout the City. The Bear Creek Greenway is identified on the map but specific conditions or capacity issues with the greenway are not noted. The City intends to develop a bike specific plan to analyze the network and its needs more closely. This level of detail is not provided in the plan.

It should be noted that SV only provided one specific example of a bike lane that "looks to be around 3' [...]". SV concludes from this one example that "The draft TSP does not include any description of the LTS methodology but it likely relied upon the flawed inventory." The Level of Traffic Stress methodology was applied per industry standards and the ODOT Analysis Procedures Manual (APM) by the City's consultant, Kittleson Associates, and used the City's GIS database. City staff are aware that some on-road bicycle facilities (bike lanes) do not meet current standards, this condition is not known to be pervasive throughout the City's bicycle network nor is it the City's "practice" to construct "too narrow of bike lanes". Only under specific and relatively infrequent conditions where right-of-way is inadequate to accommodate standards compliant facilities would the City diverge from industry standards. SV provides no quantitative evaluation to substantiate its assertion to the contrary.

Failure 9

SV Conclusions

Conclusion 9a: The draft TSP's failure to include a "description of the type" of improvements planned, the standards that will be used, their planned capacity and their location is inconsistent with the requirements of OAR660-12-0020(3)(b).

Staff's Response:

SV omits the actual language found within the referenced administrative rule which reads

"A system of planned transportation facilities, services and major improvements. The system shall include a description of the type or functional classification of planned facilities and services and their planned capacities and performance standards [...]"

The rule requires a project description OR the functional classification. Tables 5, 6, 7, 8, 9, 10, 11, 1, 14, 15, 16, 18, 19, accompanying maps, and Section 5 of the TSP more generally, provide both functional classification of proposed projects as well as brief descriptions of proposed improvements. Additionally, Section 5 provides graphic representations of street cross sections for each functional class.

Failure 10

SV Conclusions

Conclusion 10a: The City's use of LTS 2 as a basis for its bicycle transportation facilities designs discriminates against those people who may have lower bike handling skills, are old, are younger than a teen, people having a physically limiting condition, and groups of people composed of multi-generational bicycle riders (i.e. families).

Conclusion 10b: The Plan's approach to bicycle transportation (by setting LTS 2) fails to serve all ages and abilities of people; including people who 1) now ride only on the Bear Creek Greenway, 2) limit their bicycling to their own residential neighborhood, 3) ride a bike but only for recreational purposes on the weekend, 4) are afraid to ride a bicycle on City streets, or 5) may want to "drive" a bicycle in the future.

Conclusion 10c: The use of LTS 2 is inconsistent with Object 11 of the draft TSP which reads: "The City of Medford will strive to develop and maintain a well-connected transportation system for all modes and users." (emphasis added)

Staff's Response:

SV incorrectly concludes that "the City will rely upon Level of Traffic Stress (LTS) 2 as the standard for street upgrades and new construction." LTS 2 was selected as a standard for evaluation of the City's current bicycle facilities in part because, as SV observes, many of the City's higher order streets would fail to meet LTS 1. Using that standard would not have been useful in identifying facilities that could remain at LTS 2, those that should be improved to LTS 2, and those that should be improved to LTS 1. In its critique of the proposed TSP, SV seems to assume, unrealistically so, that all roads within the City must be improved to LTS 1. Much of Medford was developed decades ago, and implementation of such a standard on every higher order City street (collectors and arterials) would not be financially feasible nor would it necessarily serve the interests of "all users with all levels of ability". Conflating ubiquity of a particular type of facility or a specific level of service with meeting the needs of bicyclists of varying abilities merely assures that such facilities will be ubiquitous, not that specific needs are met in the most effective manner. Retrofitting older facilities located within established neighborhoods is typically much more expensive than constructing new facilities as development occurs. Additional expense for one project may mean that other projects that would more effectively meet the needs of bicyclists cannot be built.

In direct contradiction of SV's conclusion, cross sections for newly constructed roads clearly call for protected on-road and/or separated off-road bicycle facilities. Even in instances where existing roads are reconstructed, the City of Medford has pursued LTS 1 facilities. This choice is demonstrated by the City's recent decision to include both off-road multi-use path and on-road buffered bike lanes for the upcoming reconstruction of

the North Phoenix Road/Foothill Road corridor. This major regional transportation corridor will eventually connect the cities of Eagle Point and Phoenix.

As mentioned many times throughout this response, SV also fails to acknowledge dedicated annual funding in addition to the major roadway and multi-use path projects that are included in the proposed project list. Project PR2 identifies $100,000 for annual investment in bicycle facilities. Investment of these funds will guided by the Goals, Objectives, and Actions set forth by the proposed TSP including Objectives 1, 2, 3, 7,9, 10, 11, 12, and 13.

CITY OF MEDFORD
AGENDA ITEM COMMENTARY

www.ci.medford.or.us

Item No: 60.1

DEPARTMENT: Human Resources
PHONE: 541-774-2010
STAFF CONTACT: Bonnie Barasch, Director

AGENDA SECTION: Consent Calendar
MEETING DATE: November 1, 2018

COUNCIL BILL 2018-127
An ordinance authorizing the execution of an agreement with the City of Medford and Medford Police Officers Association pertaining to salary, hours, fringe benefits, and other working conditions for July 1, 2018 through June 30, 2021.

SUMMARY AND BACKGROUND
Council is requested to consider a three year agreement with Medford Police Officers Association. The previous agreement, representing employees within the Police Department, expired June 30, 2018. The proposed three year agreement July 1, 2018 - June 30, 2021 provides consistency with Council direction regarding hours and other working and total compensation with wages and fringe benefits.

PREVIOUS COUNCIL ACTIONS
On November 12, 2015 – Council Bill 2015-116 was approved authorizing an agreement with Medford Police Officers Association.

ANALYSIS
The proposed agreement provides for:

1. Salary increases: 2.50% effective 7/1/18, 2.50% effective 7/1/2019, and 2.50% effective 7/1/2020.

2. Health insurance: the cap for the City contribution to insurance premium would be set at $1,800 per month effective January 1, 2019. The cap would then increase to $1,850 per month effective January 1, 2020, and to $1900 per month effective January 1, 2021.

3. Additional amendments were proposed and tentatively agreed on pending ratification by the bargaining group. These amendments have minimal financial impact and provide for clarity within the agreement.

FINANCIAL AND/OR RESOURCE
The total increased compensation cost of the proposed action has been estimated by the Finance Department to be approximately $341,241 for the first year of the agreement, approximately $352,841 for the second year of the agreement, and approximately $365,049 for the third year of the agreement. Funds for the contract increases for the current year of the biennium will be absorbed through existing savings that have been realized to date.

TIMING ISSUES
If the Council chooses not to approve this proposed agreement, negotiations with the bargaining unit will need to be re-opened.

COUNCIL OPTIONS
- Approve the ordinance as presented.
- Modify the ordinance as presented.
- Deny the ordinance as presented and direct staff regarding further action.

STAFF RECOMMENDATION
Staff recommends approval of the ordinance authorizing the agreement with Medford Police Officers Association.

SUGGESTED MOTION
I move to approve the ordinance authorizing the agreement with Medford Police Officers Association.

EXHIBITS
Ordinance
Agreement on file in City Recorder's office.

ORDINANCE NO. 2018-127

AN ORDINANCE authorizing the execution of an agreement with the City of Medford and Medford Police Officers Association pertaining to salary, hours, fringe benefits, and other working conditions for July 1, 2018 through June 30, 2021.

THE CITY OF MEDFORD ORDAINS AS FOLLOWS:

That the execution of an agreement with the City of Medford and Medford Police Officers Association pertaining to salary, hours, fringe benefits, and other working conditions effective July 1, 2018 through June 30, 2021, is hereby authorized.

PASSED by the Council and signed by me in authentication of its passage this _____ day of _____, 2018.

ATTEST: _____ _____
City Recorder Mayor

APPROVED _____, 2018. _____
Mayor

CITY OF MEDFORD
AGENDA ITEM COMMENTARY

www.ci.medford.or.us

Item No: 60.2

DEPARTMENT: Public Works
PHONE: (541) 774-2100
STAFF CONTACT: Cory Crebbin, Public Works Director

AGENDA SECTION: Consent Calendar
MEETING DATE: November 1, 2018

COUNCIL BILL 2018-128

An ordinance authorizing cash payments to Hayden Homes LLC for Street System Development Charge credits in the amount of $291,512.08 for right-of-way dedication and street construction on Owen Drive completed as a condition for approval for Delta Estates Phase 2 & 3.

SUMMARY AND BACKGROUND

Approve an ordinance authorizing payment to Hayden Homes LLC for Street System Development Charge (SSDC) credits resulting from dedication of right-of-way and street construction on Owen Drive, done as a condition of approval for Delta Estates Phases 2 & 3.

PREVIOUS COUNCIL ACTIONS

On June 15, 2017, Council approved Council Bill 2017-57 adopting the 2017-19 biennial budget and making appropriations thereunder, including funds for paying developer Street SDC credits shown on Page 8-54.

ANALYSIS

As a condition of development approval for Delta Estates Phases 2 & 3, the Developer was required to construct Owen Drive through the development to Collector Street Standards. This required the dedication of land and street construction to provide a 44' wide roadway within a 74' wide public right-of-way from approximately Torrent Street east to Cheltenham Street.

Medford Municipal Code 3.815(5)(c)(i)(a) directs that all SSDC credits for eligible land dedications and street improvements will be paid in cash per applicable expense authority limits of the City's contracting and purchasing code. The total SSDC credits for the constructed portion of Owen Drive equal $291,512.08. This amount exceeds the authority of staff and Council approval for these payments is required.

Delta Estates Phases 2 & 3 has 41 residential lots. Cash payments of $2,945.19 (the SSDC for a single-family residence) will be made to Hayden Homes LLC as the SSDC is paid for each lot. Excess SSDC credits, which is the amount of SSDCs over the SSDCs to be paid during development by each lot, totals $170,759.29. This amount will be paid to Hayden Homes LLC upon approval by the Council.

FINANCIAL AND/OR RESOURCE CONSIDERATIONS

Payments totaling $26,170.52 shall be made from project SDC0000 Street SDC Credits – Right-of-way shown on page 8-54 of the budget.

Payments totaling $265,341.56 shall be made from Project SDC0000 Street SDC Credits – Construction shown on Page 8-54 of the budget.

TIMING ISSUES

An initial payment of $170,759.29 shall be made to the Developer upon approval of this ordinance. The remaining $120,752.79 in credits shall be paid in increments of $2,945.19 for 41 lots as SSDCs are paid.

COUNCIL OPTIONS

- Approve the ordinance as presented.
- Modify the ordinance.
- Deny the ordinance and provide direction to staff.

STAFF RECOMMENDATION
Approve the ordinance for cash payments to Hayden Homes LLC, for Street SDC credits generated as a result of right-of-way dedication and street construction on Owen Drive, a Collector street.

SUGGESTED MOTION
I move to approve the ordinance authorizing payment of Street SDC credits to Hayden Homes LLC in the total amount of $291,512.08.

EXHIBITS
Ordinance
Map
SDC Credit Calculations

ORDINANCE NO. 2018-128

AN ORDINANCE authorizing cash payments to Hayden Homes LLC for Street System Development Charge credits in the amount of $291,512.08 for right-of-way dedication and street construction on Owen Drive completed as a condition of approval for Delta Estates Phase 2 & 3.

WHEREAS, the Street System Development program credits developers that dedicate land and construct right-of-way improvements for the City's arterial and collector street system; and

WHEREAS, if the amount of the credit exceeds the Street System Development Charges for the development, the developer may be paid in cash for the excess credits in accordance with Section 3.815(5)(c) of the Medford Municipal Code; and

WHEREAS, the Medford Municipal Code requires City Council approval prior to issuing payments for System Development Charge credits over $100,000; now, therefore;

THE CITY OF MEDFORD ORDAINS AS FOLLOWS:

That cash payments to Hayden Homes LLC, of Street System Development Charge credits in the total amount of $291,512.08 for right-of-way dedication and street construction on Owen Drive completed as a condition of approval of Delta Estates Phase 2 & 3 is hereby authorized, payable as follows:

1) An initial payment of $170,759.29 shall be made to the developers upon approval of this ordinance; and
2) $120,752.79 in credits shall be paid in increments of $2,945.19 for each of 41 lots as individual building permits are issued. After 10 years have passed, any remaining credits expire.

PASSED by the Council and signed by me in authentication of its passage this _____ day of _____, 2018.

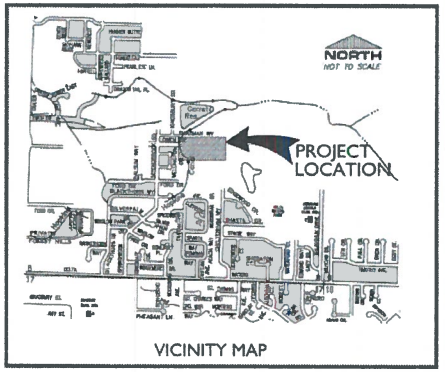
ATTEST: _____ _____
City Recorder Mayor

APPROVED _____, 2018. _____
Mayor

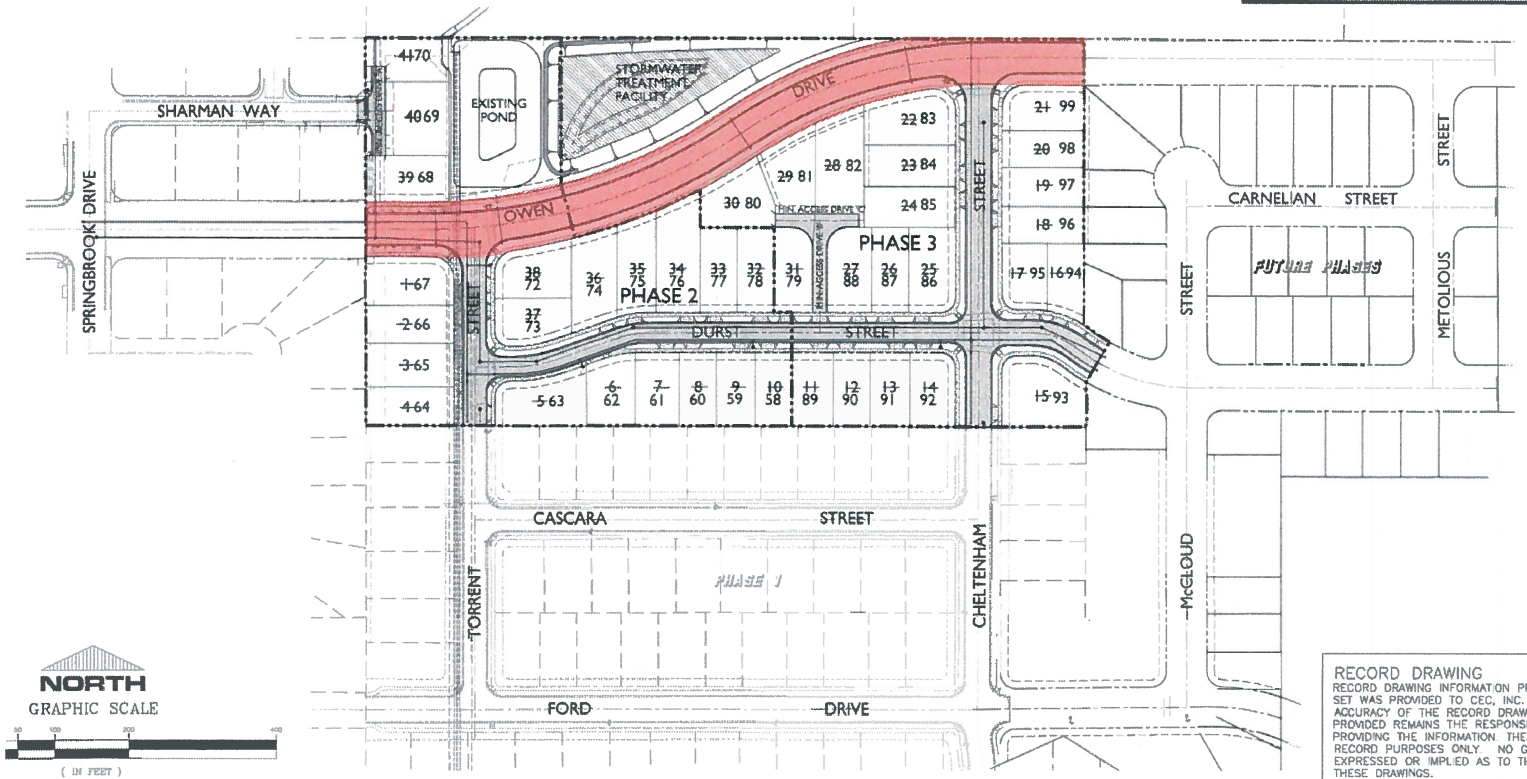
CIVIL IMPROVEMENT PLANS
FOR

DELTA ESTATES, PHASES 2 AND 3

LOCATED IN
SECTION 8, T. 37 S., R. 1 W., W.M.
TAX LOT 1102
CITY OF MEDFORD
JACKSON COUNTY, OREGON



VICINITY MAP



INDEX MAP

NORTH
GRAPHIC SCALE
(IN FEET)
1 inch = 100 ft.

RECORD DRAWING
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CONSTRUCTION ENGINEERING CONSULTANTS, INC.
P.O. BOX 1724 • MEDFORD, OREGON 97501
PH. (541) 779-6268

DRAWN BY: DLG DATE: 01/17
CHECKED BY: MWK, AMB DATE: 01/17
APPROVED RVS: DATE:
APPROVED: DATE:
APPROVED: DATE:
APPROVED: DATE:

REGISTERED PROFESSIONAL ENGINEER
65278PE
OREGON
JULY 11, 2006
ANTHONY M. BAKKE
EXPIRES: 12/31/18

STREET SDC CREDIT CALCULATION FORM

A. PROJECT INFORMATION

Delta Estates Phase 2 & 3

Parent Proj. No.		PLANNING NUMBER	
Paving Proj. No.	P1880D	LDS	16-090
Project Name:	Delta Estate Phases 2 & 3	LDP	
Location:		PUD	
		SPAC	
		Bldg Permit	
Date of Final Order	11/10/2016	Other	
Date of R/W Dedication			
Date of 1st Plan Submittal:	3/2/2017		
Date of Final Inspection:	6/20/2018		

Developer Name:	Hayden Homes LLC	
Mailing Address:	2464 SW Glacier Place, Suite 110	Phone: (541) 923-6607
City/State/Zip:	Redmond, OR 97756	

B. STREET SDC CREDIT CALCULATIONS

1. Right-of-Way Dedication Credits

a. Street Name: **Owen Drive**

1) *Parent parcel:* 371W08 (Map) 1102 (Tax Lot)

Parent parcel size: 32.11 Ac x 43,560 = 1,398,712 sf

Parent parcel valuation: $517,020 (Per County or Appraisal?) C A

Unit valuation ($/sf): $0.37 per sf

Area dedicated: STA 13+76.64 to STA 23+92.84

1016 (Length) X Varies (Width) = 72,982 sf

Reduction for partial dedication on east end of Owen Drive:

0 (Length) X 0 (Width) = 2,182 sf

Net right-of-way area to credit: = 70,800 sf

2) ***Total Credit for Right-of-way*** = $26,170.52

2. Street Construction Credits

Applicable Const. Cost Factor = ***$400,749***

a. **Street Name:** **Owen Drive**

1) ***Roadway Construction Credits (Multiplier = 0.0000118)***

Area of street pavement (curb face to curb face): STA 13+76.64 to STA 23+92.84

1016 (Length) X 44 (Width) = 44,704.00 sf

Net Roadway Area to Credit = 44,704.00 sf

SDC Credit Rate per SF of Roadway Area:

0.0000118 X $400,749 (ConstCostFactor) = $4.729 per sf

Sub-Total Roadway Credits =

44,704.00 X $4.729 = $211,397.98

2) ***Curb and Gutter Credits (Multiplier = 0.0000198)***

Length of C & G for this street = 1823 lf

Reduction in length for direct access (if any) = lf

Net length of C& G to credit = 1823 lf

SDC Credit Rate per LF of C&G:

0.0000198 X $400,749 (ConstCostFactor) = $7.935 per lf

Sub-Total Curb & Gutter Credits

1823 X $7.935 = $14,465.20

STREET SDC CREDIT CALCULATION FORM

3) ***Sidewalk Credits (Multiplier = 0.0000087)***

Area of eligible sidewalk:

1159.00 (Length)	X	5 (Width)	=	5,795.00 sf	

SDC Credit Rate per SF of Sidewalk Area:

0.0000087	X	$400,749 (ConstCostFactor)	=	$3.487	

Sub-Total Sidewalk Credits

5,795.00	X	$3.487	=		$20,204.36

4) ***Illumination (Multiplier = 0.009619)***

Number of street lights to credit			=	5	

SDC Credit Rate per Street Light:

0.009619	X	$400,749	=	$3,854.80	

Sub-Total Street Light Credits:

5	X	$3,854.80	=		$19,274.02

5) ***Total Credit for Construction*** = **$265,341.56**

3. TOTAL STREET SDC CREDITS (R/W + CONST) = **$291,512.08**

C. FORM ROUTING INFORMATION

Credit Calc's Prepared by:	J. Cope	Date:	9/20/2018
Credit Calc's Checked by:	D. Burroughs	Date:	9/28/2018
Date to Bus Mgr:			
HTE Proj. Code.	NA		
AIC Needed ?	Y		
Date of Council Action:			

D. SDC CREDIT DISTRIBUTION

SDC fee per lot	**$2,945.19**	(Local street access)	
No. lots	41		
Total SDC fees	$120,752.79	Deduct from Total Credit	$120,752.79
Excess credit (if any) to be paid 'up front'			$170,759.29
Total amount to be distributed btw the lots			$120,752.79
CREDIT AMT TO BE DISTRIBUTED PER LOT			**$2,945.19**

E. PROJECT ACCOUNTING

R/W Credits 6112(CE)	$0.08977508	8.977508%
Const Cred 6111(CC)	0.910224921	91.022492%

CITY OF MEDFORD
AGENDA ITEM COMMENTARY

www.ci.medford.or.us

Item No: 60.3

DEPARTMENT: Planning Department
PHONE: (541) 774-2390
STAFF CONTACT: Angela Durant, Principal Planner

AGENDA SECTION: Consent Calendar
MEETING DATE: November 1, 2018

COUNCIL BILL 2018-129
An ordinance authorizing the execution of an agreement granting Community Development Block Grant funds in the amount of $250,000.00 to Youth 71five Ministries for the acquisition and renovation of real property located at 11 Almond Street.

SUMMARY AND BACKGROUND
Council is requested to consider approval of a resolution authorizing the execution of a grant agreement with Youth 71five Ministries (previously known as Rogue Valley Youth for Christ) (Youth 71five) for the acquisition and renovation of real property. Youth 71five was awarded 2018/19 Community Development Block Grant (CDBG) funds in the amount of $250,000 to purchase 11 Almond Street. The building will be converted to a vocational training and transitional housing facility for homeless and at risk of becoming homeless youth and young adult's ages 17 to 24 years. Renovations will provide a training area, classrooms, office space, kitchen, storage space, bathroom/shower facilities, and 14 dormitory-style housing units accommodating two students each for up to 24 months. The vocational training facility will be on the first floor and housing on the second. Youth 71five will manage the vocational training program offering students training in one or more of six higher-wage trades including automotive repair, lube and oil technology, construction, sheet metal fabrication, welding and HVAC. Job placement services will also be provided. Hearts with a Mission will partner with Youth 71five to manage the transitional housing facility with 24/7 supervision and case management services. The intent of this partnership is to ensure students have access to safe, reliable housing while completing their training and developing life skills for future self-sustainability.

PREVIOUS COUNCIL ACTIONS
On May 7, 2015, Council approved Council Bill 2015-46 adopting the 2015-2019 Consolidated Plan for Housing and Community Development to establish the city's priority needs and goals associated with the use of CDBG funds during the five-year period.

On June 21, 2018, Council approved Resolution 2018-66 adopting the 2018/19 Action Plan for use of the City's CDBG funds for fiscal year 2018-19. This project was included in the 2018/19 Action Plan as presented herein.

ANALYSIS
As identified in the City's 2015-2019 Consolidated Plan, there is a strong need for transitional housing and housing for households earning extremely low to no income. The Plan also identifies the lack of living wage jobs as a barrier to sustainable housing and avoiding homelessness. Providing housing to students while obtaining alternative education can help them elevate their earning potential without the cost of higher education. There is also a high demand in Medford for increased construction labor to ameliorate one of the barriers to affordable housing development. A decline in young workers entering the industry over the past decade is likely a contributing factor to this deficit. Youth 71five project can help address these needs utilizing City resources and a property that is currently underutilized.

The property is located close to services, transportation routes and recreation options for young adults. Youth 71five has executed an option to purchase the property at $82.62 per square foot, approximately 60% less than the average low price of recent comparatives. Youth 71five has raised private funds to pay for renovation estimated at $400,000, which is also estimated at less than 75% of the post-renovation property value. City staff has completed the HUD-mandated Environmental Assessment, which concluded in a Finding of No Significant Impact (FONSI) on the environment or residents. The FONSI was posted in

the Mail Tribune on October 11, 2018, and mailed to property owners and occupants within a 200 foot radius. Staff concludes that all necessary measures have been taken to proceed with a request for Council approval of the proposed CDBG grant agreement.

FINANCIAL AND/OR RESOURCE CONSIDERATIONS
This project is budgeted for $250,000 under 731 - CDBG Fund. The City will receive reimbursement from HUD for the full amount after a direct wire is executed by the City.

TIMING ISSUES
The City Council must approve the grant agreement on November 1, 2018, in order to issue Youth 71five a Notice to Proceed with the property acquisition, which is scheduled for November 15, 2018.

COUNCIL OPTIONS
- Approve the resolution as presented
- Modify the resolution as presented
- Deny the resolution as presented and direct staff regarding further action

STAFF RECOMMENDATION
Staff recommends approval of the resolution to authorize the execution of the grant agreement.

SUGGESTED MOTION
I move to approve the resolution to authorize the execution of the grant agreement.

EXHIBITS
Resolution
Agreement on file in the City Recorder's Office
Environment Record on file in the City Recorder's Office

ORDINANCE NO. 2018-129

AN ORDINANCE authorizing the execution of an agreement granting Community Development Block Grant funds in the amount of $250,000 to Youth 71five Ministries for the acquisition and renovation of real property located at 11 Almond Street.

THE CITY OF MEDFORD ORDAINS AS FOLLOWS:

That the execution of an agreement, granting Community Development Block Grant funds in the amount of $250,000 to Youth 71five Ministries for the acquisition and renovation of real property located at 11 Almond Street, which agreement is on file in the City Recorder's office, is hereby authorized.

PASSED by the Council and signed by me in authentication of its passage this _____ day of _____, 2018.

ATTEST: _____ _____
City Recorder Mayor

APPROVED _____, 2018. _____
Mayor