



City of Tigard, Oregon

2035

Transportation System Plan

VOLUME 1 OF 3

Adopted by Tigard City Council | November 23, 2010



City of Tigard

2035 Transportation System Plan

VOLUME 1 OF 3

Tigard, Oregon

Prepared for:

City of Tigard

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Preface

The progress of this plan was guided by the Project Management Team (PMT) made up of City of Tigard staff with input from the Oregon Department of Transportation (ODOT). The project was also guided by a Technical Advisory Committee (TAC), Citizens Advisory Committee (CAC), City Council and Planning Commission.

The TAC provided guidance on technical aspects of the 2035 Tigard Transportation System Plan (2035 TSP) and consisted of staff members from the surrounding communities. The CAC ensured that the needs of people in the community of Tigard are incorporated in the 2035 TSP. The CAC consisted of Tigard residents who provided input throughout the process.

Membership of these different groups are shown below.

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Section 1

Introduction

Introduction

Purpose of the Plan

The 2035 Tigard Transportation System Plan (2035 TSP) is an important long-range planning tool for Tigard as it prepares for future growth in the community and region. The 2035 TSP, an update of the previously adopted plan, was initiated in 2008 and completed in 2010. The completion of the 2035 TSP is timely for two reasons. First, traffic congestion has consistently ranked as the number one issue facing Tigard in community attitude surveys and the city is committed to finding solutions to this issue. Secondly, the community has developed a vision for Tigard's future and a key component of this vision is developing an efficient and balanced multi-modal transportation system. The TSP ensures the vision for the transportation system meets community needs, communicates the city's aspirations, and conforms to state and regional policies. An effective TSP will provide:

- ▶ A blueprint for transportation investment;
- ▶ A coordination tool with regional agencies and local jurisdictions;
- ▶ An important component of prudent and effective land use choices; and
- ▶ Answers to existing and future transportation needs related to bicycles, pedestrians, transit, vehicles, freight and rail.

The document meets the state requirements for a TSP and acts as a resource for staff, decision makers and the public. It identifies the preferred multi-modal transportation system, consisting of a network of facilities adequate to serve local, regional and state transportation needs. It is the principal document used for identifying the function, capacity and location of future facilities, directing resources to transportation projects, and providing the community with the level of investment that will be needed to support anticipated development within the community.

One important task in the development of the 2035 TSP was to consider land use and transportation efforts already completed by the city. This allowed the TSP to analyze and build upon previously adopted plans to ensure consistency and continuity for the transportation system. Plans for Downtown Tigard, the Washington Square Regional Center, Highway 217 and Pacific Highway (99W) were incorporated into the TSP.

The TSP also serves as the transportation element, and as a supporting document, of the Tigard Comprehensive Plan (Comp Plan) as required by state law. Goals and policies were identified at an early stage of the TSP update and are adopted as the Goal 12: Transportation element of the Comp Plan. These goals and policies will help to guide future decisions. It was important to ensure the transportation goals and policies were coordinated with the entire Comp Plan because an integrated land use and transportation system is essential to reaching the community's vision. In general, as the Comp Plan is "comprehensive" in nature, all goals and policies are intended to be supportive of one another.

The Tigard Transportation Planning Environment

Transportation planning in Tigard is shaped by opportunities and constraints as much as by transportation needs. Growth within Tigard and in the surrounding areas increases travel demand and associated congestion. The built environment makes major roadway expansions costly to construct. At the same time that these costs rise, competition is high for scarce transportation funding resources. There is also

a greater awareness of the negative impacts that come from creating an environment geared toward reliance on personal automobile travel. There is growing concern about greenhouse gas (GHG) emissions as well as dependency on foreign oil and rising fuel costs. Reliance on automobile travel instead of active transportation, such as walking and cycling, is also one culprit in the rise of obesity, including among children. While there are myriad strategies to combat these issues, a critical role for transportation is the provision of a balanced, multi-modal transportation system.

These challenges—the built environment, high costs, limited funding, environmental impacts, and personal health issues—were significant in shaping the 2035 Tigard TSP. At the same time, they helped direct the plan toward opportunities to integrate Tigard’s transportation system with regional and state investment plans; to promote land use patterns that support those investments; to minimize impacts to the local community; and to provide Tigard residents with options for personal, recreational and commute travel. Some issues and opportunities that influenced the development of the 2035 TSP are summarized below.

▶ **Transportation System Management: Making the Existing System Work Better**

As the challenges of roadway expansions are increasing, new technologies and practices are being employed to improve the functioning and operations of existing transportation resources through a wide array of management measures. The broad term for these measures is Transportation System Management (TSM). There is growing emphasis at the national, state and regional levels for increasing the application of TSM measures. Examples include improved traffic signal and system coordination; transit priority treatments on congested corridors; travel demand management strategies to shift demand toward other modes or time periods; and access management measures to streamline traffic flow on major corridors. These can be effective ways to improve existing streets rather than adding travel lanes.

▶ **Multi-modal System Planning: Providing Travel Options**

Motor vehicle travel is now, and will continue to be, the primary mode of travel serving Tigard within the 2035 TSP horizon. As such, future transportation investments in Tigard must support a safe and reliable roadway system to accommodate current and forecast demand. However, many people are realizing benefits—cost savings, quality of life, community connection, health and fitness, and sustainability—of walking, cycling, carpooling or using public transit. In order to meet the future travel needs of the community, increased transit, walk and bike shares are essential to the future transportation system in Tigard, as much as adding expensive roadway capacity for increased demand. This will be accomplished through a combination of strategic investments and partnerships that are identified in this Plan, including regional plans calling for multi-modal refinement plans in key corridors, such as Pacific Highway.

▶ **Transit Investments: Public Transit Connections**

Tigard has an opportunity to gain federal, state and regional investments for significant transit improvements. The opening of the Westside Express Service (WES) commuter rail line in 2009 was a first step in establishing urban rail as a transit option for Tigard residents and employees. As a further step to major transit infrastructure, TriMet and Metro have identified the Pacific Highway/Barbur Boulevard corridor as the next priority for high capacity transit (HCT) service in the region. The process of developing HCT will include years of planning, engineering, and design to ensure that future land development, transit access and local circulation will support transit investments.

► **Connectivity: Local Mobility**

Connectivity in Tigard is severely challenged by Highway 217, I-5 and the WES commuter/freight rail line as well as Fanno Creek, Bull Mountain and other natural features. These challenges are exacerbated by a built environment that precludes efficient connections through the prevalent use of cul-de-sacs and other dead-end streets. Such limited service roadways are attractive for neighborhoods because they limit traffic volumes and travel speeds. However, they contribute to inefficiency in the circulation system and over-reliance on major arterials. One of the priorities of the 2035 TSP is to identify and preserve potential opportunities for future connectivity improvements in order to protect and maximize the function of the existing transportation network.

► **Land Use Patterns: Developing for Efficient Transportation**

The types, intensities and locations of different land uses are major determinants of travel patterns. Land use patterns in the City of Tigard and surrounding areas are suburban in character, with residential areas separated from commercial areas and a relatively low density of development overall. This development pattern results in travel demand that is highly directional according to typical weekday peak periods. Tigard has adopted plans for a more compact urban form in several areas including downtown, and the Washington Square Regional Center (WSRC). The 2035 TSP supports such land use strategies to mitigate the strain on the roadways by shortening home-to-work trips, supporting transit service, and making walk/bike trips more viable for work, shopping and other activities.

► **Major Roadways: I-5, Highway 217 and Pacific Highway**

Tigard is at the juncture of three major state highways: Pacific Highway, Highway 217 and I-5. While they serve as important access routes to and from Tigard, they also pose significant barriers and constraints.

Highway 217 and I-5 are both limited access freeways. Because they are under ODOT jurisdiction, the city has no direct operational authority over them. Access to and from Tigard is provided by the ramp interchanges, which are also governed by ODOT. Both highways provide critical access to and from Tigard. However, congestion is commonplace along the highways and at interchanges. Plans for widening have not moved forward largely due to significant costs. Without capacity and operational improvements, congestion on these facilities results in regional traffic cutting through Tigard as a detour route.

Pacific Highway is a statewide highway and freight route carrying more than 50,000 vehicles per day on some sections through Tigard. Given these designations, the highway plays a critical role in regional and statewide mobility, providing a primary connection between the Willamette Valley and the Oregon Coast and cities in between. Traffic on the segment within Tigard is divided nearly evenly between local trips and through traffic. Because it is an at-grade roadway, the high through traffic has a significant impact on adjacent properties. Heavy traffic results in traffic congestion, compromises the pedestrian and bicycle environment, and creates challenges for transit service. The limited capacity for additional traffic threatens to limit development opportunities in Tigard.

Strategies for this important highway must balance the needs for statewide and regional travel, along with potential local impacts. These include direct improvements to the highway to improve traffic operations as well as connectivity improvements within Tigard to reduce reliance on Pacific Highway for local travel. Many opportunities to address these competing needs have been explored in earlier planning and engineering studies, which have been incorporated into the 2035 TSP.

Continuous east-west travel on Tigard streets is primarily served by Durham Road and Bonita/McDonald/Gaarde. These routes are frequently constrained during weekday peak periods, with predictable traffic flow reflecting the housing/jobs development patterns in Tigard and the region. To an extent, these roads provide connections between I-5 and neighboring cities. While widening these roadways could improve traffic flow, the evaluation of such improvements must be balanced with the benefits for local and through traffic, and the impacts to be borne by the local community.

► **Special Areas**

Three areas within Tigard—Tigard Triangle, WSRC, and Downtown—represent considerable growth opportunities but also significant transportation challenges. Even when bounded by significant transportation facilities, congestion is an issue for trips to, from, and through these areas. For this reason, an emphasis on mixed-use development that supports transit, walking and cycling trips is a critical focus of transportation planning for these areas. They are addressed separately in the main chapter of this TSP.

Plan Background/Regulatory Context

The Oregon Revised Statutes require that the TSP be based on the current Comprehensive Plan land uses and that it provide for a transportation system that accommodates the expected growth in population and employment that will result from implementation of the land use plan. Development of this TSP was guided by Oregon Revised Statute (ORS) 197.712 and the Department of Land Conservation and Development (DLCD) administrative rule known as the Transportation Planning Rule (TPR, OAR 660-012).

The TPR requires that alternative travel modes be given consideration along with the automobile, and that reasonable effort be applied to the development and enhancement of the alternative modes in providing the future transportation system. In addition, the TPR requires that local jurisdictions adopt land use and subdivision ordinance amendments to protect transportation facilities and to provide bicycle and pedestrian facilities between residential, commercial and employment/institutional areas. It is further required that local communities coordinate their respective plans with the applicable county, regional and state transportation plans.

Further requirements were adopted by the Oregon Legislature in 2009 in Oregon House Bill 2001—Jobs & Transportation Act (JTA). Among the chief changes introduced in JTA is an emphasis on sustainability. JTA requires the development of a least cost planning model, as well as planning for reduction in greenhouse gas (GHG) emissions. Precise implementation measures and evaluation technologies are still under development. However, these elements were integrated in concept in the development of the TSP. The TSP was also prepared consistent with the Portland Metro 2035 Regional Transportation Plan (RTP). The RTP provides a regional framework for transportation planning and investment, including implementation of Metro’s 2040 Growth Concept. The update of the Tigard TSP has been developed in

close coordination with the 2035 RTP update process in order to ensure consistency at the state and regional levels. A memo summarizing how the TSP and implementing ordinances are compliant with the TPR and other regulatory requirements is provided in the Volume 2 Technical Appendix.

Planning Work Foundation

The development of the TSP began with a review of the local and statewide plans and policies that guide land use and transportation planning in the city. In addition to the previous adopted transportation plan (2002), the TSP incorporates the following other transportation planning efforts:

- ▶ Washington Square Regional Center Plan (1999)
- ▶ Washington County 2020 Transportation Plan (2002)
- ▶ Tigard Downtown Improvement Plan (2005)
- ▶ Metro Highway 217 Corridor Study (2006)
- ▶ Tigard Highway 99W Improvement and Management Plan (2007)
- ▶ Tigard Downtown Circulation Plan (2010)
- ▶ Metro 2035 Regional Transportation Plan (2010)

A complete list of the plans and policies reviewed as part of the project is included in *Technical Memorandum #1: Plans and Policy Review* included the Volume 3 Technical Appendix.

Public Involvement

Public involvement for the development and review of the 2035 TSP was achieved in several ways:

- ▶ Involvement of citizens on the Citizens Advisory Committee (CAC), including three committee meetings;
- ▶ Assistance and review of agency representatives on a Technical Advisory Committee (TAC), including three committee meetings;
- ▶ Regular updates in the city newsletter;
- ▶ Two public forums and one open house;
- ▶ Targeted outreach with local community and service organizations; and
- ▶ Public hearings as part of the adoption process.

Through these types of public involvement and outreach, the citizens of Tigard were provided with opportunities to identify their priorities for future transportation projects within the City through a variety of forums. The city's website, as well as an e-mail list of interested citizens, businesses, City staff, boards/commissions, and agencies, was used to announce public meetings, disseminate information, and solicit input/feedback from the community. In addition, city staff met with the City Council to present each of the five technical memorandum leading up to the TSP document.

Organization of the TSP

The entire 2035 Tigard TSP is comprised of a main document (Volume 1) as well as two volumes of technical appendices. The TSP is organized as follows:

Volume 1

Volume 1 is the “final report” of the 2035 TSP and includes items that will be of interest to the broadest audience.

- ▶ **Section 2** includes the goals and policies that were developed to guide the city’s long-range vision of transportation system needs.
- ▶ **Section 3** provides a transportation planning “toolbox” which helps define some of the terms and concepts that are integrated into the 2035 TSP.
- ▶ **Section 4** summarizes the process that was undertaken to develop the 2035 TSP, including the screening and evaluation of transportation strategies and projects.
- ▶ **Section 5** includes specific policy guidelines and standards, as well as multi-modal improvement projects to address existing and forecast transportation needs.
- ▶ **Section 6** provides the funding element of the TSP. This section also lists the financially constrained project list.
- ▶ **Section 7** outlines changes in the Tigard codes and policies that will be required to implement the 2035 TSP.
- ▶ **Section 8** provides a glossary of acronyms and other transportation terms.

Volume 2

Volume 2 includes technical information that directly supplements Volume 1, including the specific implementing ordinances for the TSP and elements of relevant elements from related plans.

Volume 3

Volume 3 includes the technical memoranda that were prepared in the development of the 2035 TSP and includes the detailed data and analysis that were used to prepare the final plan.

Section 2

Goals and Policies

Goals and Policies

The 2035 Tigard Transportation System Plan (2035 TSP) goals and policies stated in this section were developed at the outset of the planning process and were used to guide the city's long range vision for the transportation system. They incorporate and build upon existing transportation goals and policies and prior plans adopted by the city. They also integrate regional and statewide planning rules and policy, including the requirement for a multi-modal, balanced approach to transportation policy. The goals and policies reflect the guidance received from the CAC, TAC and the Planning Commission during the planning process.

The transportation goals and policies identify the intent of the city to accomplish certain results. They relate to one another and are obligations the city wishes to assume. They also provide the necessary link to the transportation element of the Tigard Comprehensive Plan and their purpose and function have been coordinated with the balance of the Tigard Comprehensive Plan to ensure consistency. As outlined in further detail in the Tigard Comprehensive Plan, the goals are general statements indicating a desired end; while policies identify the city's position and a definitive course of action that will contribute to achieving the goal.

The general transportation goals of the 2035 TSP are:

- ▶ Goal 1: Land Use and Transportation Planning Coordination
- ▶ Goal 2: Transportation Efficiency
- ▶ Goal 3: Multi-modal Transportation System
- ▶ Goal 4: Safe Transportation System
- ▶ Goal 5: Interagency Coordination
- ▶ Goal 6: Transportation Funding

Additionally, action measures were developed that, if executed, would implement the goals and policies. These statements refer to specific projects, standards, or courses of action the city desires to take in regard to specific issues. The strategies are suggestions to future decision-makers, but do not obligate the city to accomplish them. Most of the strategies resulted from the findings in the needs and deficiencies analysis. Others are standard transportation planning activities that either need to be updated or would be beneficial to improving the transportation system.

Goal 1: Land Use & Transportation Coordination

Develop mutually supportive land use and transportation plans to enhance the livability of the community.

The city shall plan for a transportation system that meets current community needs and anticipated growth and development.

¹The policies are not implementable as a land use action without inclusion in land use regulations. Therefore, land use regulations should reflect the transportation framework developed in this section of the TSP.

1. The city shall prioritize transportation projects according to community benefit, such as safety, performance and accessibility, as well as the associated costs and impacts.
2. The city shall maintain and enhance transportation functionality by emphasizing multi-modal travel options for all types of land uses.
3. The city shall promote land uses and transportation investments that promote balanced transportation options.
4. The city shall develop plans for major transportation corridors and provide appropriate land uses in and adjacent to those corridors.
5. The city shall support land use patterns that reduce greenhouse gas emissions and preserve the function of the transportation system.
6. The city shall strive to protect the natural environment from impacts derived from transportation facilities.
7. The city shall mitigate impacts to the natural environment associated with proposed transportation construction or reconstruction projects.
8. The city shall coordinate with private and public developers to provide access via a safe, efficient and balanced transportation system.
9. The city shall require all development to meet adopted transportation standards or provide appropriate mitigations.

Goal 2: Transportation Efficiency

Develop and maintain a transportation system for the efficient movement of people and goods.

1. The city shall adopt and maintain transportation performance measures.
2. The city shall manage the transportation system to support desired economic development activities.
3. The city shall design streets to encourage a reduction in trip length by improving arterial, collector and local street connections.
4. The city shall design arterial routes, highway access, and adjacent land uses in ways that facilitate the efficient movement of people, goods and services.
5. The city shall cooperate with the railroads in facilitating and preserving rail freight service to existing and future businesses that depend on railroad service.
6. The city shall develop and maintain an efficient arterial grid system that provides access within the city, and serves through traffic in the city.
7. The city shall use strategies for access management, including the support of modifications that bring access points into compliance or closer to compliance with applicable standards.
8. The city recognizes freight movement as being a priority of the transportation system.
9. The city shall require the provision of appropriate parking in balance with other transportation modes.
10. The city shall strive to increase non-single occupant vehicle mode shares through vehicle trip reduction strategies, such as those outlined in the Regional Transportation Plan.
11. The city shall design the transportation system to provide connectivity between Metro designated centers, corridors, employment and industrial areas.

Goal 3: Multi-modal Transportation System

Provide an accessible, multi-modal transportation system that meets the mobility needs of the community.

1. The city shall continue to support the existing commuter rail and bus service in Tigard and will seek opportunities for increased service frequency and passenger convenience.
2. The city shall engage with regional partners to support development of High capacity transit serving the Tigard area.
3. The city shall design and construct transportation facilities to meet the requirements of the Americans with Disabilities Act.
4. The city shall develop and maintain neighborhood and local connections to provide efficient circulation in and out of the neighborhoods.
5. The city shall require development adjacent to transit routes to provide direct pedestrian accessibility.
6. The city shall develop and implement public street standards that recognize the multi-purpose nature of the street right-of-way.
7. The city shall design all projects on Tigard city streets to encourage pedestrian and bicycle travel.
8. The city shall require sidewalks to be constructed in conjunction with private development and consistent with adopted plans.
9. The city shall require and/or facilitate the construction of off-street trails to develop pedestrian and bicycle connections that cannot be provided by a street.
10. The city shall require appropriate access to bicycle and pedestrian facilities for all schools, parks, public facilities and commercial areas.

Goal 4: Safe Transportation System

Maintain and improve transportation system safety.

1. The city shall consider the intended uses of a street during the design to promote safety, efficiency and multi-modal needs.
2. The city shall coordinate with appropriate agencies to provide safe, secure, connected and desirable pedestrian, bicycle and public transit facilities.
3. The city shall require new development to provide safe access for all modes to and from a publicly dedicated street.
4. The city shall develop access management strategies for arterial and collector streets to improve safety in the community.
5. The city shall prioritize intersection improvements to address safety deficiencies.
6. The city shall include safety mitigation as a priority criterion in making transportation investments.
7. The city shall enhance and maintain a neighborhood traffic management program to address issues of excessive speeding and through traffic on local residential streets.
8. The city shall require safe routing of hazardous materials consistent with federal and state guidelines.
9. The city shall require new transportation facilities to meet adopted lighting standards.

Goal 5: Inter-agency Coordination

Coordinate planning, development, operation and maintenance of the transportation system with appropriate agencies.

1. The city shall coordinate and cooperate with adjacent agencies and service provider—including Metro, TriMet, ODOT, Washington County and neighboring cities—when appropriate, to develop transportation projects which benefit the region as a whole, in addition to the City of Tigard.
2. The city shall collaborate with other transportation providers to develop, operate and maintain intelligent transportation systems, including coordination of traffic signals.
3. The city shall coordinate with TriMet and other transit providers serving Tigard, to improve transit service to, from, through and within Tigard.

Goal 6: Transportation Funding

Fund an equitable, balanced and sustainable transportation system that promotes the well-being of the community.

1. The city shall make street maintenance a funding priority.
2. The city shall seek to invest in capital projects that leverage other infrastructure investments.
3. The city shall seek opportunities for transportation investments that support transportation goals of efficiency, multi-modal access and safety.

Action Measures

The following table summarizes strategies to implement the goals of the 2035 Tigard Transportation System Plan.

TABLE 2-1: STRATEGIES FOR IMPLEMENTING TRANSPORTATION SYSTEM PLAN GOALS	
RECOMMENDED ACTION MEASURES	GOALS SUPPORTED
Goal 1: Transportation & Land Use Planning Coordination	
Create commercial nodes within residential neighborhoods to provide residents with opportunities to walk or bike for non-commute travel purposes.	1 (2, 3)
Encourage non-auto-dependent development with mixed uses and higher densities in targeted areas, such as along Pacific Highway, Downtown Tigard and in the Washington Square Regional Center.	1 (2, 3)
Review and update development code requirements for on-site motor vehicle parking.	1 (2, 3)
Review and update development design guidelines to promote pedestrian-friendly commercial areas.	1 (2, 3)
Identify, evaluate and adopt City of Tigard performance standards that promote safe and efficient access and mobility for walk, bike and transit modes as well as personal automobile travel.	1 (2, 3, 4)
Work with State and Regional partners to identify and evaluate multi-modal mobility/performance standards for major transportation facilities.	1 (2, 3, 4, 5)
Goal 2: Transportation Efficiency	
Conduct a citywide connectivity and circulation study to identify potential circulation improvements for street systems serving Tigard.	2 (1, 3)
Create a comprehensive inventory of street stubs, unimproved right-of-way, and other potential future roadway connections to inform long range planning and development review.	2 (1, 3)
Review and update/clarify, as warranted, development code requirements for new roadway or pedestrian/bicycle connections as part of land development.	2 (1, 3)
Goal 3: Multi-modal Transportation System	
Develop parking management plans for Downtown Tigard, Tigard Triangle, Washington Square Regional Center, and other areas to support economic development and a balanced transportation system.	3 (1, 2)

RECOMMENDED ACTION MEASURES	GOALS SUPPORTED
Goal 3: Multi-modal Transportation System continued...	
Identify and adopt mode split targets that achieve and exceed Metro targets for regional centers, town centers and Downtown Tigard.	3 (1, 2)
Review and update, as warranted, street design standards to ensure that public right of way is planned, designed and constructed to provide safe and comfortable facilities for all travel modes and adequate drainage and treatment for storm water.	3 (1, 2)
Create a more complete network of pedestrian facilities by identifying and prioritizing gaps within the current sidewalk and trail system.	3 (2, 4)
Develop pedestrian and bicycle corridors to neighborhoods, schools, parks, recreation uses, activity centers and transit stops.	3 (1, 2, 4)
Prioritize transit, pedestrian and bicycle investments in areas serving a high proportion of disadvantaged or transit dependent communities.	3 (1, 2, 4, 5, 6)
Fill in gaps in the bicycle network to provide for greater citywide bicycle mobility.	3 (2, 4)
Develop bicycle routes that connect neighborhoods, schools, parks, recreation uses and activity centers.	3 (1, 2, 4)
Develop a bicycle signage program to help cyclists find routes on relatively level terrain with low traffic volumes.	3 (2, 4)
Engage with regional planners and service providers to support transit as a travel option with increased frequency for buses, high capacity transit and WES commuter rail.	3 (1, 2, 5)
Improve the comfort, convenience and safety for transit users through bus shelters, seating, signage and other bus stop/station features.	3 (4, 5)
Provide local transit connector service linking residential neighborhoods with transit stations/stops, employment and retail centers, schools and recreational areas.	3 (1, 2)
Work with Metro and other regional partners to advance high capacity transit in the Pacific Highway/Barbur Boulevard corridor.	3 (1, 5)
Goal 4: Safe Transportation System	
Review high crash locations, including state and county data, and develop a system for evaluating and prioritizing safety mitigations.	4 (3, 5)
Continue to implement neighborhood traffic management techniques to promote safety and livability in residential neighborhoods.	4 (1, 2, 3)
Improve pedestrian crossing treatments at high traffic volume streets and/or locations with high levels of pedestrian demand (e.g., schools, retail centers, transit stops, etc.).	4 (1,3)

RECOMMENDED ACTION MEASURES	GOALS SUPPORTED
Goal 5: Inter-agency Coordination	
Partner with regional and county transportation planning organizations to leverage statewide and federal transportation funding for local projects.	5 (1, 2, 3, 4, 6)
Work with regional and state partners to mitigate negative impacts to Tigard from high traffic volumes traveling through Tigard on state facilities, including capacity enhancements on Highway 217 and Interstate 5.	5 (1, 2, 3, 4)
Work with state and regional partners to develop alternative mobility standards in order to accommodate desired land development changes.	5 (1, 2, 3, 4)
Goal 6: Transportation Funding	
Periodically review and revise transportation system development charges to ensure the cost of development is appropriately covered.	6 (1, 2, 3, 4)
Periodically review and evaluate the street maintenance fee to ensure the most appropriate and equitable calculations are being used.	6 (2, 3, 4)
Continue to seek grant monies to plan for and develop multi-modal infrastructure improvements.	6 (2, 3, 4, 5)
Continue to submit project proposals for regional, state, and federal transportation monies to implement the Tigard 2035 TSP.	6 (1, 2, 3, 4, 5)

Section 3

**Transportation
Planning Toolbox**

Transportation Planning Toolbox

Several major roadways are showing significant capacity issues with resulting traffic congestion during several hours of a typical weekday. These capacity issues are expected to worsen as population and employment growth add to travel demand. At the same time, increases in roadway capacity through widening existing roads or constructing new roads are often prohibitively expensive in terms of construction costs, right of way acquisition and impacts to adjacent properties. While expansion of roadway capacity is a component of the 2035 Tigard Transportation System Plan (2035 TSP), a greater emphasis is placed on measures to manage the existing roadway system and to increase the convenience and viability of alternative travel modes.

This section summarizes the range of alternative solutions within the transportation planning toolbox in addition to traditional roadway widening projects that were considered during the development of the 2035 TSP. They include solutions to enhance the quality and availability of pedestrian, bicycle and transit systems in order to shift travel demand toward a more balanced system. Also included are measures to improve the traffic operations on the existing system.

Travel Modes

The City of Tigard, in partnership with state, regional and neighboring jurisdictions, recognizes the importance of providing a balanced transportation system. In order to meet the current and future travel needs of the community, increased transit, walk and bike shares are essential to the future transportation system in Tigard, as much as adding roadway capacity for increased demand.

As part of the 2035 Regional Transportation Plan (RTP) and the 2040 Growth Concept, Metro identified maximum share targets for Single Occupancy Vehicle (SOV) travel for Tigard overall, as well as for the designated Centers. Metro's travel demand model estimates base year and forecast mode shares as a function of several factors, including street connectivity, transit availability and parking pricing. Table 3-1 shows the SOV shares used in Metro's 2005 and 2035 travel demand model, as well as the maximum SOV share in the 2040 Growth Concept.

TABLE 3-1: SINGLE OCCUPANCY VEHICLE (SOV) MODE SHARES

Tigard Area	Metro Model		Metro 2040 Target (Maximum)
	2005	2006	
Citywide	50%	49%	40–50%
Washington Square Regional Center	47%	46%	45–55%
Tigard Town Center (Downtown)	54%	51%	45–55%
Durham Road Town Center	53%	51%	45–55%
Tigard Triangle	50%	49%	55–60%

As Table 3-1 shows, the Metro model indicates that base year and forecast SOV shares are within the target range under the 2040 Growth Management plan. However, the model shows only slight improvements over the 25-year planning period. This reflects a forecast condition that assumes generally consistent conditions related to transit, parking pricing, and connectivity. As those conditions evolve to be more supportive of transit, walk and bike travel, the share of SOV trips should be lower.

Land Use

The types and intensities of land uses are significant factors influencing travel demand and mode choice. Low-density development tends to correlate with high motor vehicle travel demand, whereas dense, mixed-use developments have been found to result in shorter trips and more balanced travel mode uses.

Land use patterns in the City of Tigard and surrounding areas are suburban in character, with residential areas separated from commercial areas and a relatively low density of development overall. Based on current zoning and growth projections, most residential growth will occur in the west side of Tigard and south in the neighborhoods around Durham and Beef Bend Road. Employment growth is forecast to occur near major roadways, especially near Highway 217. The primary areas of mixed-use zoning are the Washington Square Regional Center (WSRC) and Tigard Triangle.

The city has adopted plans to significantly increase housing density in downtown. These planned changes in downtown, along with the strategies identified below, could move more houses close to jobs, increase mixed use development and help mitigate the strain on the east-west roadways by shortening home-to-work trips, supporting transit service and making walk/bike trips more viable for work, shopping and other activities.

Connectivity

Multi-modal connectivity describes the network characteristics related to frequency of and distance between connections. A well-connected network minimizes the need for out-of-direction travel while supporting efficient dispersal of travel demand among multiple parallel travel ways. Connectivity improvements for pedestrian/bicycle networks are also effective enhancements to the transportation system, including improved access to transit. A common example of efficient roadway connectivity is the traditional grid system, with north-south and east-west streets spaced at generally equal distances.

In Tigard, the existing major roadways, along with topography, natural resources and land development patterns preclude this type of network on a large scale. However, it is possible to plan for improved connectivity by preserving right of way for future connections and prioritizing funding to alleviate existing and future bottlenecks at key crossing locations.

Transportation Demand Management

Transportation Demand Management (TDM) measures include any method intended to shift travel demand from single occupant vehicles to non-auto modes or carpooling, or travel at less congested times of the day. Some common examples of TDM strategies include programs such as carpool matching assistance or

flexible work shifts; parking management strategies; direct financial incentives such as transit subsidies; or facility or service improvements, such as bicycle lockers or increased bus service.

Some of the most effective TDM strategies are best implemented by employers and are aimed at encouraging non-SOV commuting. Strategies include preferential carpool parking, subsidized transit passes, and flexible work schedules. Cities and other public agencies can play a critical role in support of TDM through provision of facilities and services, as well as development policies that encourage TDM.

Enhancing and Increasing Non-auto Travel Modes

The following summarizes improvements to the pedestrian, bicycle, and transit systems that enhance the quality of the service provided and, if implemented with the SOV demand reducing solutions described above, will likely result in increased travel by pedestrian, bicycle and transit modes.

▶ **Pedestrian System**

Pedestrian facilities are the elements of the network that enable people to walk safely and efficiently on the transportation system. The pedestrian network includes walkways (sidewalks, mixed-use trails) as well as safe crossing. Each plays a role in developing a comprehensive pedestrian network which can promote both walking trips and multi-modal trips such as using a combination of walking and transit to complete a trip. There are several different types of pedestrian crossing treatments available, each applicable under a different range of factors. A brief description of the various pedestrian crossing types is provided below.

- ▶ **Unmarked Crosswalks:** Under Oregon law, pedestrians have the right-of-way at any unsignalized intersection.
- ▶ **Marked Crosswalks:** Marked crosswalks are painted roadway markings that indicate the location of a crosswalk to motorists. Marked crosswalks can be accompanied by signs, curb extensions, and/or median refuge islands, and may occur at intersections or at mid-block locations.
- ▶ **Pedestrian Hybrid Signal:** The pedestrian hybrid signal is a pedestrian-actuated hybrid signal that would interrupt traffic on the roadway to provide a signalized protected crossing for pedestrians at an otherwise unsignalized location. Pedestrian hybrid signals are included in the new 2009 Manual of Uniform Traffic Control Devices (MUTCD, Reference 1).
- ▶ **Signalized Intersection:** Signalized intersections typically include a WALK signal that can be automatically triggered or push button actuated. This option would require review of signal warrants according to the MUTCD to determine if a signal is warranted at an intersection based on the number of pedestrian crossings.
- ▶ **Rectangular Rapid Flashing Beacon:** RRFBs consist of user-actuated amber LEDs, which have an irregular flash pattern similar to emergency flashers on police vehicles. These supplement warning signs at unsignalized intersections or mid-block crosswalks.
- ▶ **Raised Pedestrian Refuge:** This option provides a pedestrian refuge in the roadway median, allowing a two-stage crossing to occur if needed.
- ▶ **Grade-separated Crossing:** Grade-separated crossings are either underpasses or overpasses that allow pedestrians to entirely avoid conflicts with automobiles when crossing a busy roadway. When used as part of a multi-use path, grade-separated crossings also accommodate bicycles.

▶ **Bicycle System**

Bicycle facilities are the elements of the network that enable cyclists to safely and efficiently travel on the transportation system. These facilities include public infrastructure (bicycle lanes, mixed-use trails, signage and striping) as well as off-road facilities (secure parking, changing rooms and showers at worksites). Each plays a role in developing a comprehensive bicycle network.

Many different bicycle facility types are needed to create a complete bicycle network that connects people to their destinations and allows cyclists to feel safe riding. Currently, Tigard's bicycle network primarily includes bicycle lanes, shared roadways and multi-use paths.

In some locations where bicycle lanes are provided, specific conditions such as high motor vehicle volumes and travel speeds compromise the quality of the bicycle facility. In these locations, wider bike lanes or buffers (wider striping, barriers or medians) separating bicycles from vehicle traffic may be appropriate.

▶ **Types of Bicycle Facilities**

Brief descriptions of the various bicycle facility types are provided below.

- ▶ **Shared-roadway:** Any roadway without dedicated bicycle facilities is a shared roadway. In Tigard, shared roadways include all public streets without striped bicycle lanes. Where traffic volumes are low, shared roadways are generally safe and comfortable facilities for cyclists.
- ▶ **Low-Traffic Bikeway** (aka Bike Boulevard): Low-traffic bikeways are also known as bike boulevards and provide high-quality bicycle facilities on continuous street corridors with low vehicular traffic volumes. Typically, low-traffic bikeways are made on local streets, which are configured to prioritize bicycle trips and reduce through automobile trips. Local automobile access is retained. Bicycling conditions are improved by reducing stop signs to a minimum along the route and providing way-finding information specific to bicyclists. Low-traffic bikeways are best used when they parallel major roadways and can provide cyclists with a low-volume alternative route. Low-traffic bikeways are used extensively in Portland, and recent rider surveys there indicate that cyclists overwhelmingly prefer them compared to major streets with bicycle lanes.
- ▶ **Bicycle Lane:** Bicycle lanes are striped lanes on the road dedicated for the exclusive use of bicycles. Typically, bicycle lanes are placed at the outer edge of pavement (but inside of right-turn lanes and/or on-street parking). Bicycle lanes improve safety, improve cyclist security and, if comprehensive, can provide direct connection between origins and destinations.
- ▶ **Bicycle Crossings:** Bicycle crossing treatments are used to connect bike facilities at high traffic intersections, trailheads, or other bike routes. Typical treatments include bicycle detectors at traffic signals, bicycle-only signals or preferential movements for bicyclists such as only allowing bikes to make a through movement.
- ▶ **Bicycle Parking:** Bicyclists also benefit from several other types of bicycle support facilities, such as secure bicycle parking, either open or covered U-shaped racks, and storage lockers for clothing and gear. The city currently requires bicycle parking to be included in new developments as a condition of approval and TriMet buses are outfitted with bicycle racks that allow cyclists to bring their bikes with them on transit. Allowing bicycles on transit vehicles increases the range of trips possible by both transit and bicycling, and reduces cyclists' fears of being stranded in the event of a mechanical or physical breakdown.

► **Multi-use Pathways**

Multi-use pathways are other facilities dedicated to pedestrians and bicyclists. These pathways have an integral role in recreation, commuting, and accessibility for residents. Tigard's off-street trails are generally concentrated along several greenways located within the city. The most notable of these trails is the Fanno Creek Greenway which traverses the full length of the city. Trails are also located along the Tualatin River and the Pathfinder-Genesis Trail. Additionally, planned regional pathways are being developed to connect Tigard with other communities in the Portland metro area. While these pathways serve and connect several neighborhoods in Tigard, there are some remaining gaps in these facilities.

The Tigard Neighborhood Trails Plan (adopted in 2009) focuses on multi-use pathways at a neighborhood scale and developed a list of 42 recommended projects that are generally one to two blocks in length. These projects seek to improve opportunities for walking, bicycling, and using transit by creating short cut-through routes that provide access to local destinations. *A complete list of the projects from the Neighborhood Trails Plan is included in Appendix B of the Volume 2 Technical Appendix.*

While the Neighborhood Trails Plan addressed short, local connections, there are additional city and region-wide multi-use trails that are in various stages of planning and construction. In particular, the Tiedeman/Main railroad track alignment has been identified for converting a nearly three-quarter mile inactive railroad right-of-way adjacent to Tigard Street from Tiedeman to Main Streets. Conversion to a multi-use trail will provide an attractive alternative to Tigard Street for pedestrians and bicyclists, and will also be a direct connection to downtown and the transit station.

► **Transit System**

Transit service is an important part of a balanced transportation system, providing an alternative to private automobile travel for distances too far to walk or bike. TriMet is the transit service provider for the City of Tigard. The city's partnership with TriMet, as well as with regional planners is essential to development of a more comprehensive transit system. The city can also play a direct role in improving transit service by providing services that support transit use, such as transit stop amenities and good pedestrian connections.

Supporting an environment in which transit is a preferred travel option for the Tigard community requires more than direct investments in transit service. Land use, connectivity, and streetscape features have a major influence on the cost effectiveness of transit service and will help Tigard get more out of its available transit investments. For this reason, potential local strategies to improve transit service include planning for land uses that are transit supportive, in addition to providing appropriate facilities and connections to transit.

Transportation System Management

Transportation System Management (TSM) refers to a wide range of strategies that improve operations of an existing roadway system, but without roadway widening. TSM measures can be focused on improving transportation “supply” through enhancing capacity and efficiency, typically with advanced technologies to improve traffic operations. Or they may be focused on reducing transportation demand through promoting travel options and ongoing programs intended to reduce demand for drive alone trips, especially during peak travel periods. Several TSM strategies are identified for application in Tigard in existing plans, including the 2035 RTP and the Highway 99W Improvement and Management Plan (Highway 99W Plan). Some of the key strategies identified for consideration in Tigard are summarized below.

► **Signal Retiming/Optimization**

Signal retiming and optimization refers to updating timing plans to better match prevailing traffic conditions and coordinating signals. Timing optimization can be applied to existing systems or may include upgrading signal technology, including signal communication infrastructure or signal controllers or cabinets. Signal retiming can reduce travel times and be especially beneficial to improving travel time reliability. Signal retiming could also be implemented to improve or facilitate pedestrian movements through intersections by increasing minimum green times to accommodate pedestrian crossing movements during each cycle in high pedestrian or desired pedestrian traffic areas, eliminating the need to push pedestrian crossing buttons. Bicycle movements could be facilitated by installing bicycle detection along major bicycle routes. Signal upgrades often come at a higher cost and usually require further coordination between jurisdictions.

► **Advanced Signal Systems**

Advanced signal systems incorporate various strategies in signal operations to improve the efficiency of a transportation network. Strategies may include coordinated signal operations across jurisdictions as well as centralized control of traffic signals. Advanced signal systems can reduce delay, travel time, and the number of stops for vehicles, while potentially increasing average vehicle speed. In addition, these systems may help reduce vehicle emissions and have a high impact on improving travel time reliability.

The detection system, controller hardware, and software required at intersections depend on the signal system strategy. In order to implement an advanced signal system, the existing hardware and software on the roadways would be updated. The traffic signal controllers on Pacific Highway have recently been upgraded with newer models; however, many of the remaining signals in Tigard have yet to be upgraded.

Of the 79 signals in the City of Tigard, 47 are owned and maintained by ODOT; the rest are maintained by Washington County. These agencies would take the lead in signal upgrades and implementing advanced signal systems. Any strategies that may be implemented would require coordination among the City of Tigard and the jurisdictions that own and operate the signals.

Advanced signal systems may be applied to several innovative control strategies. The costs of these systems vary as a function of the types of controllers, programming needs and detection needs.

Implementing any of these systems in Tigard would require coordination with ODOT and/or Washington County. Alternative signal systems include:

- ▶ **Adaptive or active signal control systems** improve the efficiency of signal operations by actively changing the allotment of green time for vehicle movements and reducing the average delay for vehicles. Adaptive or active signal control systems require several vehicle detectors at intersections in order to detect traffic flows adequately, in addition to hardware and software upgrades.
- ▶ **Traffic responsive control** uses data collected from traffic detectors to change signal timing plans for intersections. The data collected from the detectors is used by the system to automatically select a timing plan best suited to current traffic conditions. This system is able to determine times when peak-hour timing plans begin or end; potentially reducing vehicle delays.
- ▶ **Transit signal priority systems** use sensors to detect approaching transit vehicles and alter signal timings to improve transit performance. This improves travel times for transit, reliability of transit travel time, and overall attractiveness of transit. The City of Portland has the only system of bus priority in the region, which is applied on most of the major arterial corridors throughout the city.

▶ **Real-time Traveler Information**

Traveler information consists of collecting and disseminating real-time transportation system information to the traveling public. This includes information on traffic and road conditions, general public transportation and parking information, interruptions due to roadway incidents, roadway maintenance and construction, and weather conditions. Traveler information is collected from roadway sensors, traffic cameras, vehicle probes and, recently, media access control (MAC) devices such as cell phones or laptops. Data from these sources are sent to a central system and subsequently disseminated to the public so that drivers track conditions specific to their route and can provide historical and real-time traffic conditions for travelers.

When roadway travelers are supplied with information on their trips, they may be able to avoid heavy congestion by altering a travel path, delaying the start of a trip or changing which mode they choose to use. This can reduce overall delay and fuel emissions. Traveler information projects can be prioritized over increasing capacity on roadway, often with high project visibility among the public.

▶ **Real-time Transit Information**

Transit agencies or third-party sources can disseminate both schedule and system performance information to travelers through a variety of applications, such as in-vehicle, wayside or in-terminal dynamic message signs, as well as the Internet or wireless devices. Coordination with regional or multi-modal traveler information efforts can increase the availability of this transit schedule and system performance information. TriMet has implemented this through its Transit Tracker system.

These systems enhance passenger convenience and may increase the attractiveness of transit to the public by encouraging travelers to consider transit as opposed to driving alone. They do require cooperation and integration between agencies for disseminating the information.

▶ **Access Management**

Access management describes a practice of managing the number, placement, and movements of intersections which provide access to adjacent land uses. These access points are considered in context with the traffic flow, safety, capacity and speed on the surrounding road system. Within developed areas, access management strategies may include shared or consolidated access points, restrictions on access point movements (medians, channelized movements), or closing access points. Access management provides several potential benefits, such as reducing crashes and crash rates and increasing capacity on the main roadway by maintaining vehicle flows and speeds.

In addition, well deployed access management strategies can greatly improve travel conditions for pedestrian and bicycles. Eliminating the number of access points on roadways reduces the number of potential interruptions and conflict points between pedestrians, bicyclists and cars.

Access management is typically adopted as a policy in development guidelines. It can be extremely difficult to implement an access management program once properties have been developed along a corridor. Cooperation among, and involvement of, relevant government agencies, business owners, land developers and the public is necessary to establish an access management plan that benefits all roadway users and businesses.

▶ **Neighborhood Traffic Management**

Neighborhood Traffic Management (NTM) is a term that has been used to describe traffic control devices typically used in residential neighborhoods to slow traffic or possibly reduce the volume of traffic. NTM is descriptively called traffic calming due to its ability to improve neighborhood livability. Tigard has done extensive work in the way of testing and implementing NTM measures such as speed humps, chokers, pavement texturing, circles, chicanes and other elements. The following are examples of neighborhood traffic management strategies that have been applied in Tigard:

- ▶ speed wagon (*reader board that displays vehicle speeds*)
- ▶ speed humps
- ▶ traffic circles
- ▶ medians
- ▶ landscaping and street trees
- ▶ chokers (*narrow roadways in short sections*)
- ▶ narrow streets
- ▶ closing streets
- ▶ photo radar
- ▶ on-street parking
- ▶ selective enforcement
- ▶ neighborhood watch
- ▶ curb extensions

A wide range of traffic control devices are being used throughout the region, including such devices as chokers, medians, traffic circles and speed humps. Also, NTM may be considered in an area-wide manner to avoid shifting impacts between areas and should only be applied where a majority of neighborhood residents agree that it should be done. Research of traffic calming measures demonstrates their effectiveness in reducing vehicle speeds. Table 3-2 summarizes nationwide research of over 120 agencies in North America.

TABLE 3-2: NEIGHBORHOOD TRAFFIC MANAGEMENT PERFORMANCE								
Measures	No. of Studies	Speed Reduction (MPH)			Volume Change (ADT)			Public Satisfaction
		Low	High	Avg.	Low	High	Avg.	
Speed Humps	262	1	11.3	7.3	0	2922	328	79%
Speed Trailer	63	1.8	5.5	4.2	0	0	0	90%
Diverter	39	-	-	.4	85	3000	1102	72%
Circles	26	2.2	15	5.7	50	2000	280	72%
Enforcement	16	0	2	2	0	0	0	71%
Traffic Watch	85	.5	8.5	3.3	0	0	0	98%
Chokers	32	2.2	4.6	3.3	45	4100	597	79%
Narrow Streets	4	5	7	4.5	0	0	0	83%

SOURCE: Survey of Neighborhood Traffic Management Performance and Results, ITE District 6 Annual Meeting, by R S. McCourt, July 1997.

Typically, NTM receives a favorable reception by residents adjacent to streets where vehicles travel at speeds above 30 mph. However, NTM can also be contentious because it may be perceived by one neighborhood as just moving the problem from one neighborhood to another rather than solving it. Traffic calming may also be perceived as impacting emergency travel or raising liability issues. A number of streets in Tigard are identified in the functional classification as neighborhood routes. These streets are typically longer than the average local street and might otherwise attract cut-through traffic. These may be appropriate locations for consideration of NTM applications.

Section 4

Development of
the 2035 TSP

Development of the 2035 TSP

The 2035 Tigard Transportation System Plan (2035 TSP) builds on past planning efforts as well as an updated analysis of existing conditions, forecast needs, and a multi-step evaluation of improvement options. The analysis of transportation needs was coupled with a detailed review of relevant state, regional and local plans and policies. Parallel to these phases was a public involvement process to gain input on key issues and concerns and to inform the community regarding the outcomes of the process. This section summarizes the regulatory context, the foundation of previous planning, the public involvement process, and the key findings of the baseline, forecast and alternatives analysis.

The section is organized as follows:

- ▶ **2008 Baseline Conditions Analysis**
- ▶ **2035 Forecast Analysis**
- ▶ **Alternative Analysis**
- ▶ **Changes from the 2002 TSP**

Baseline Analysis

Once the project vision, goals and objectives were determined as summarized in Section 2, an inventory of the existing transportation system was developed. This inventory documented all major transportation-related facilities and services within the Tigard Urban Planning Area. The data and analysis included an inventory of the roadway network, traffic conditions, safety performance, bicycle and pedestrian facilities, and transit service, among other topics. The findings of the technical analysis are summarized in Technical Memorandum #3 in the Volume 3 Technical Appendix. In addition, existing conditions analysis included an inventory of natural resources and identified areas with high proportions of population groups that might warrant specific consideration with regard to transportation needs. These are summarized below.

▶ **Environmental Resources Evaluation**

The environmental evaluation summarizes current resources within the Tigard Urban Planning Area in order to avoid and limit adverse impacts on them in developing transportation projects. Figure 4-1 displays regionally significant fish and wildlife habitat that were identified as Goal 5 resources by Metro in 2005. Metro staff developed the Goal 5 inventory based on the best existing science and data at the time and input from local agencies, resource agencies, technical review committees, and the public. Metro staff conducted fieldwork to validate and adjust the inventory. The habitat resources in the inventory were then ranked in importance based on their capacity to provide benefits to fish and wildlife. The Goal 5 resources identified in Tigard are primarily associated with the Fanno Creek system, which is a tributary of the Tualatin River that passes through Tigard on its journey to the south. In addition to these resources, floodplain and wetland data were summarized for inclusion in project evaluations.

▶ **Socioeconomic Conditions**

An evaluation of socioeconomic conditions was conducted as part of the environmental justice analysis for transportation needs. The analysis was conducted in order to meet the needs and avoid undue adverse impacts to certain populations when examining potential transportation improvements. Census data were used to evaluate census blocks within the planning area based on percentages of the population comprised of one or more of the following populations:

- ▶ **Minority groups:** people who did not self-identify as white — non-Hispanic
- ▶ **Low-income residents:** people who earned between 0–1.99 times the federal poverty level in 1999
- ▶ **Seniors:** people 65 years of age or older in 2000
- ▶ **Non-English speakers:** people who stated that they did not speak any English at all in 2000
- ▶ **People with disabilities:** people five years or older with any type of disability: sensory, physical, mental, self-care, go-outside-the-home or employment

Under the Metro 2035 RTP definition, an area has “significant” environmental justice populations if it has more than 2.5 times the regional average for that population. Within the Tigard planning area, no significant minority or disabled populations were identified; however, several block groups were identified for significant non-English-speaking, senior and low-income populations. These areas are depicted in Figure 4-2.

The existence of significant environmental justice populations was considered in the evaluation of potential transportation projects both for the capacity to meet needs as well as for potential negative impacts of new facilities. It is notable that there is a gap in transit service on Hall Boulevard between Pacific Highway and Locust Street in the vicinity of considerable low income residents. Transit dependent residents of these neighborhoods must walk along Hall Boulevard to get to the nearest bus stops. While the city is not a provider of transit service, pedestrian and bus stop amenities in this vicinity should be considered priorities in order to improve transit access for these neighborhoods. Details of this and other aspects of the 2008 Base Conditions Analysis are provided in Technical Memorandum #3 in the Volume 3 Technical Appendix.

Figure 4-1

Environmental Resources

Tigard Urban Planning Area

-  Water Bodies
-  Wetland Inventory
-  Goal 5 Resources
-  Floodplain

Other Map Elements

-  Transit Center
-  Tigard City Boundary
-  Other Rail Lines



** The information represented on this map is current as of December 23, 2010. Revisions will be made as new decisions or amendments occur to alter the content of the map.

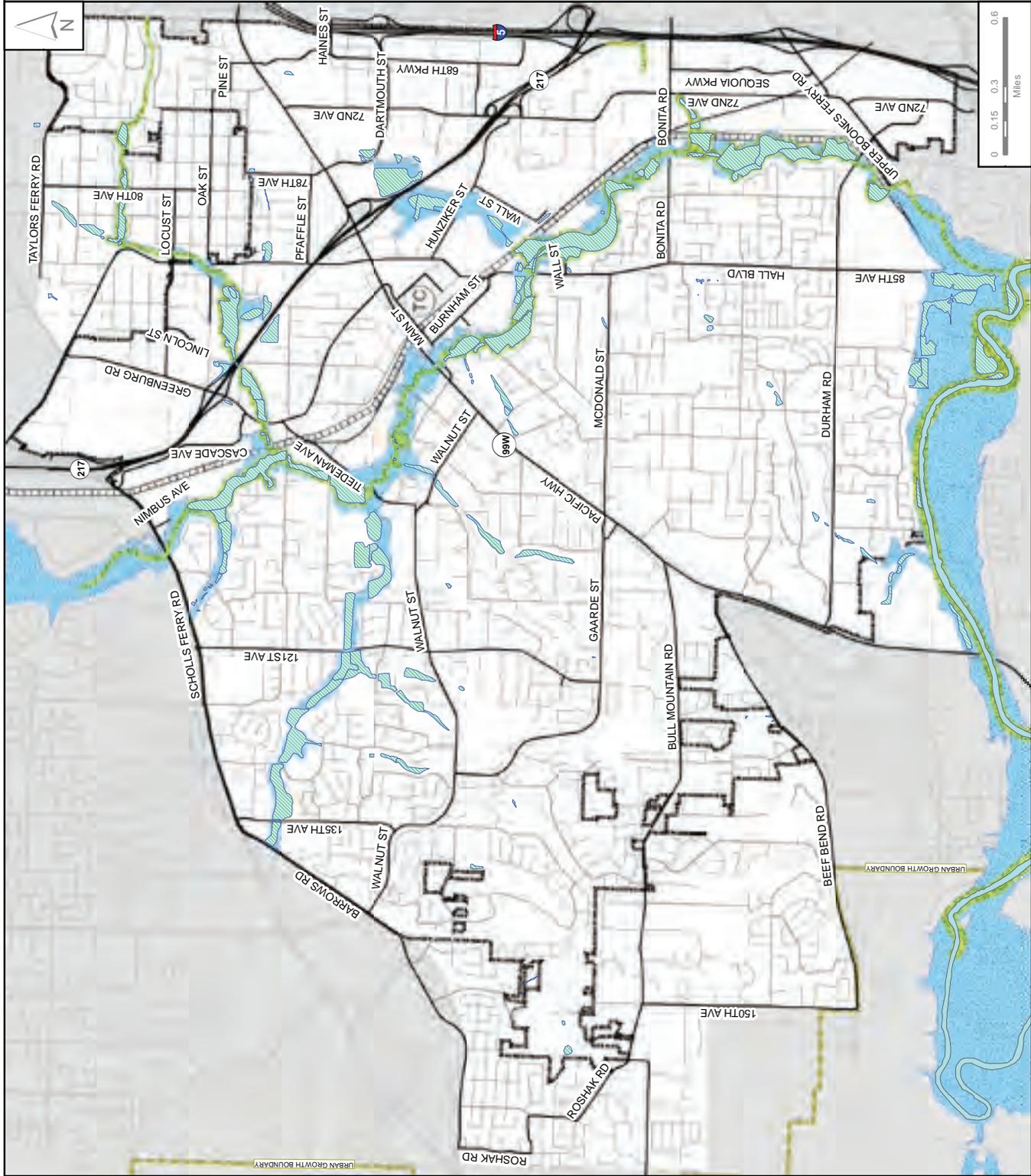


Figure 4-2 Environmental Justice Populations

Tigard Urban
Planning Area

Significant Populations*

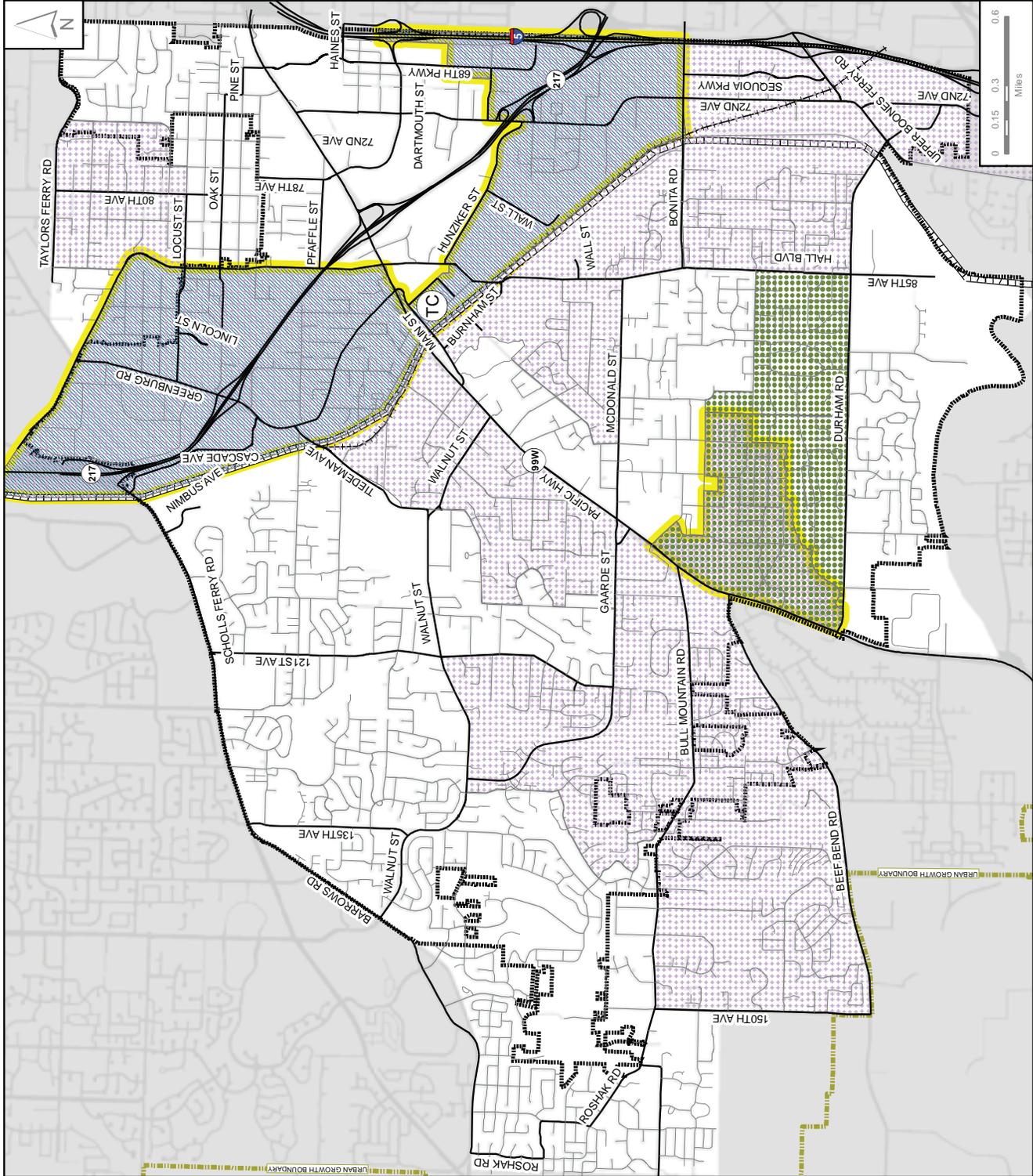
-  Low-Income
-  Non-English Speaking
-  Senior
-  Significant Areas

Other Map Elements

-  Transit Center
-  Tigard City Boundary
-  Other Rail Lines



** The information represented on this map is current as of December 23, 2010. Revisions will be made as new decisions or amendments occur to alter the content of the map.



* Significant environmental justice populations are based on the Metro 2035 Update definition: Census Block Groups with more than 2.5 times the regional average for that population.

Note: Block Groups highlighted in yellow represent areas where two or more significant populations are identified.

Sources: 2000 Census, 2008 RLLS Lite

2035 Forecast Analysis

Development of long-term (year 2035) transportation system forecasts relied heavily on the Metro Travel Demand Model. The model predicts future travel needs based on forecast housing and population. The model also incorporates planned improvements to the transportation system. Future transportation conditions were evaluated based on the forecast travel demand and planned improvements. Technical Memorandum #4: Transportation Needs and Deficiencies included in the Volume 3 Technical Appendix.

Metro currently uses 2005 household (single family units, mixed-use units) and employment (retail jobs and “other”) data as its base and has developed year 2035 household and employment forecasts. Year 2035 forecasts include estimates of future households and employment within the Tigard planning area. The population and employment data for both 2005 and 2035 are summarized in Table 4-1.

TABLE 4-1: 2035 HOUSEHOLD AND EMPLOYMENT PROJECTIONS

2005		2035		Growth, 2005–2035	
Households	Employment	Households	Employment	Households	Employment
26,160	43,734	35,071	68,564	8,911	24,829

As shown in Table 4-1, Tigard’s households are projected to increase by 8,900 between 2005 and 2035 and employment is projected to increase by approximately 24,800 jobs (34 percent and 57 percent increases, respectively). These translate to annualized growth in households of approximately 1.1 percent per year and annualized growth in employment of 1.9 percent per year.

Figure 4-3 shows that the areas anticipated for the most residential growth are on the west side of Tigard and south in the neighborhoods around Durham Road. It should be noted that West Bull Mountain is outside of the planning area but also has significant anticipated growth in housing. Figure 4-4 shows that the areas anticipated for the most employment growth are concentrated along Highway 217 including the areas around Washington Square Regional Center, downtown, the Tigard Triangle and Pacific Highway.

The residential and employment development patterns reflected in Figures 4-3 and 4-4 will have the effect of exacerbating existing pressure on the roadway system, especially during the weekday peak periods. The critical directions of traffic flow are generally eastbound in the morning and westbound in the evenings, as commuters travel to and from work via the I-5, Highway 217, Pacific Highway and major arterials. Accommodating future residential and employment growth with a more balanced distribution of land uses will help to alleviate strain on the transportation system and promote a more efficient use of the roadways.

Figure 4-3

Forecast Household Growth 2005 to 2035
Tigard Urban Planning Area

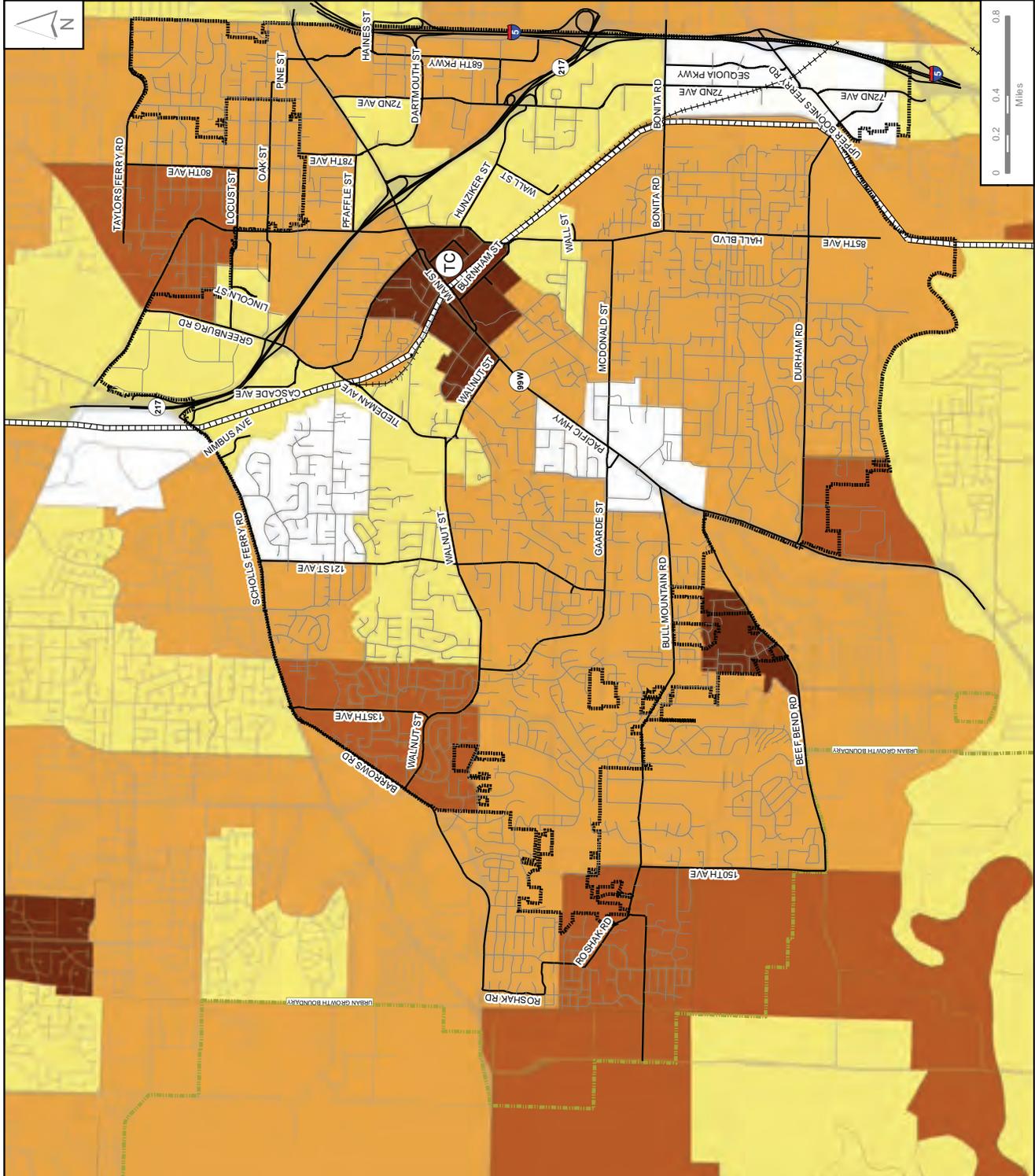
- Change in Households Per Acre**
- White box: Negative or No Change
 - Light yellow box: 0 to 0.5 HH/Acre
 - Orange box: 0.5 to 1.5 HH/Acre
 - Dark orange box: 1.5 to 2.5 HH/Acre
 - Dark red box: more than 2.5 HH/Acre

Other Map Elements

- TC in a circle: Transit Center
- Dashed line: Tigard City Boundary
- Four parallel lines: Other Rail Lines



** The information represented on this map is current as of December 23, 2010. Revisions will be made as new decisions or amendments occur to alter the content of the map.



Note: Forecast household growth for the downtown reflects planning aspirations, but wasn't included in the Metro model (shown as negative or no change in the model).

Figure 4-4

Forecast Employment Growth 2005 to 2035

Tigard Urban Planning Area

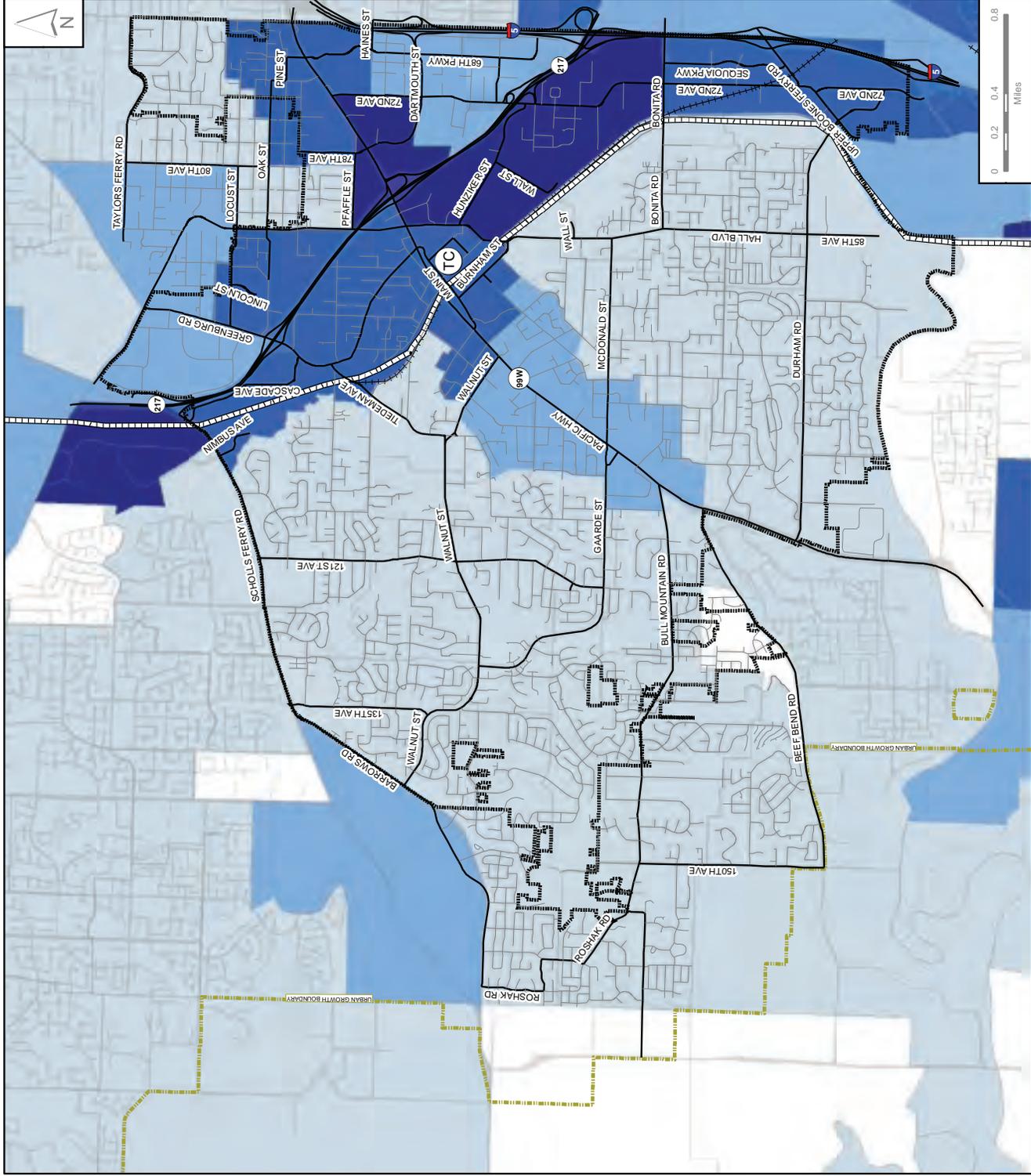
- Change in Employment/Acre**
- ◻ Negative or No Change
 - ◻ 0 to 1 Job/Acre
 - ◻ 1 to 3 Jobs/Acre
 - ◻ 3 to 5 Jobs/Acre
 - ◻ More than 5 Jobs/Acre

Other Map Elements

- (TC) Transit Center
- ▬▬▬▬▬▬ Tigard City Boundary
- ++++ Other Rail Lines



**The information represented on this map is current as of December 23, 2010. Revisions will be made as new decisions or amendments occur to alter the content of the map.



Note: Forecast employment growth for the downtown reflects planning aspirations, but wasn't included in the Metro model (shown as 1 to 3 Jobs/Acre in the model).

▶ **Growth Assumptions for Downtown: Modeling Implications**

The City of Tigard plans for increased residential and commercial density in Downtown Tigard, as reflected in Figures 4-3 and 4-4. These planned changes in downtown, along with the city's land use strategy to increase mixed-use development, are intended to mitigate the strain on the east-west roadways by shortening home-to-work trips, supporting transit service and making walk/bike trips more viable for work, shopping and other activities.

The city's aspirations for growth have not yet been incorporated into the Metro travel demand model. As a result, the 2035 model forecast underestimates the travel demand to and from downtown. While this is a meaningful disparity, it was determined that the potential negative impacts of this disparity are lessened by the following considerations:

- ▶ The intent of the higher density, mixed use development is to accommodate a higher proportion of travel demand by non-automobile travel modes;
- ▶ The most critical need for a higher density downtown will be the provision of multiple access points and an efficient overall circulation pattern; and,
- ▶ The current planning process for downtown includes a grid of two-lane streets to create and preserve a safe, efficient, and pedestrian-friendly circulation system. Larger street cross sections would conflict with these objectives, even if travel demand modeling indicated a desire for more automobile capacity.
- ▶ The arterial streets providing access to Downtown (Pacific Highway, Hall Boulevard, Greenburg Road) are already planned for their maximum roadway width of five lanes. The City does not intend to increase the roadway footprints. If the downtown growth requires specific capacity improvements at critical intersections, those could be developed and are not dependent on inclusion in the TSP.

Given these considerations, emphasis was placed on ensuring efficient access and connectivity for downtown, as well as planning for improved pedestrian, bicycle and transit access.

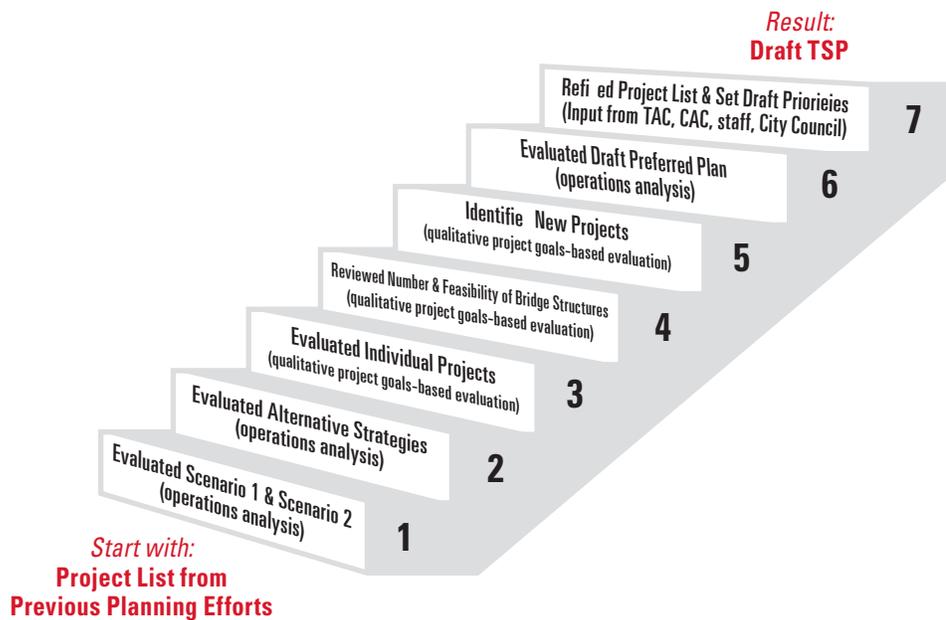
Alternatives Analysis

Substantial effort was devoted to developing and evaluating alternatives to address existing and future transportation needs within the Tigard Urban Planning Area. While there is a recognized need for expanded roadway capacity in some areas, emphasis was placed on measures that provide a balanced multi-modal transportation system and investments that enhance the efficiency of the existing systems. This section provides an overview of the alternatives analysis, project evaluations, and project prioritization that occurred in developing the preferred plan. The process, illustrated in exhibit 7, is described below:

► Step 1: Review of Planned Projects

Projects from previous planning documents were reviewed and analyzed. Two scenarios were developed to distinguish between planned projects with the higher likelihood of receiving funding. The evaluation identified which planned projects are expected to be most effective as well as areas of continued congestion and capacity problems in spite of planned projects. Technical Memorandum #4 in the Volume 3 Technical Appendix;

Exhibit 1: Alternatives Analysis and Project Evaluation Sieves



► Step 2: Application of TSM Strategies

Transportation System Management (TSM) strategies were applied to the forecast roadway operations. This scenario was evaluated to determine if the magnitude of the impact of these strategies could reduce the needs for new roadway infrastructure investments. The TSM strategies that were modeled included 1) signal system improvements on major corridors, as planned in the 2035 RTP and 2) access management strategies on Pacific Highway, as identified in the Highway 99W Plan.

► Step 3: Evaluation of Individual Projects

Individual projects were evaluated both quantitatively and qualitatively. Major roadway capacity increases were modeled to determine the level of travel demand that would be accommodated or otherwise impacted by the project. In addition, a series of evaluation criteria were developed from the goals identified in Section 2. The seven criteria for screening and prioritizing project alternatives were: multi-modal mobility, system capacity, consistency with local/regional plans, safety, cost-effectiveness, environmental resources and environmental justice.

The evaluation criteria were applied to new projects, projects being considered for removal from the TSP, and projects that were otherwise considered critical or notable. The rating method used to evaluate each project is illustrated in Table 4-2.

TABLE 4-2: QUALITATIVE RATING SYSTEM		
Goal	Rating	Meaning
Multi-modal Mobility		Significantly improves transportation options, or connectivity within a mode
		Moderately improves transportation options, or connectivity within a mode
		Does not change transportation options or connectivity
System Capacity		Project improves system capacity
		Project does not significantly change system capacity
		Project decreases system capacity
Consistency with other jurisdiction Local, Regional Plans		Included as part of other local jurisdiction, regional, and/or state plans
		Not mentioned but consistent with the intent of other plans
		Inconsistent with local jurisdiction, regional, and/or state plans
Safety		Provides a safety enhancement in an area with noted safety deficiency or an area with significant pedestrian and/or bicycle traffic.
		Provides a safety enhancement to one or more modes of travel.
		Provides no improvement or negative impacts to overall system safety.
Cost-Effectiveness		Provides significant increases in mobility compared to the relative cost.
		Provides reasonable increase in mobility compared to the cost.
		Provides little increase in mobility compared to the cost.
Environmental Resources		Enhances parks, wetlands, or other environmentally sensitive areas
		Does not impact environmentally sensitive areas
		Impacts environmentally sensitive areas
Environmental Justice		Enhances transportation options for designated population neighborhoods
		No obvious impact to designated population neighborhoods
		Negatively impacts designated population neighborhoods

A notable finding from this step was that there were projects from previous planning efforts that no longer meet the community goals. As such, the following projects were removed from the TSP:

- ▶ Nimbus Avenue Extension due to environmental impacts to Fanno Creek and related cost effectiveness.
- ▶ Wall Street Extension due to cost effectiveness and potential environmental justice impacts.
- ▶ New interchange on Highway 217 at the extension of SW 68th Avenue due to inconsistency with the RTP and ODOT plans.

▶ **Step 4: Review of Bridge Projects**

Due to their high costs, the projects requiring bridge structures to cross highways and railroad tracks were considered to determine if all were necessary, identify which projects were most desired within the planning horizon as well as those that should be include for the purpose of long-term right-of-way protection. This review identified existing plans for a total of seven grade-separated crossings.

The individual project evaluations in Step 3 were supplemented with the overall review of the number of costly grade-separated crossing proposed. On that basis, the following crossings have been removed from the TSP or modified:

- ▶ Northern Washington Square Regional Center crossing (Highway 217 crossing) was modified to a pedestrian and bicycle connection only.
- ▶ Wall Street extension (railroad crossing) was removed due to cost effectiveness and potential environmental justice impacts as described as part of Step 3.
- ▶ Dartmouth Street/Hunziker connection (over Highway 217) was removed due to cost and redundancy with the Hunziker Street/Hampton Street Connection.
- ▶ Durham Road extension under I-5 was not included due to limited system benefits and cost effectiveness.

The following crossings were recommended to remain in the 2035 TSP:

- ▶ Northern Washington Square Regional Center crossing (as pedestrian/bike connection only)
- ▶ Southern Washington Square Regional Center crossing
- ▶ Hunziker Street/Hampton connection over Highway 217

▶ **Step 5**

Step 5 of the alternatives analysis included evaluation of potential new roadway projects that would benefit overall multi-modal system operations. Two of the notable new projects in the 2035 TSP include the North Dakota-Pfaffle Neighborhood Route and North Dakota realignment. These projects are envisioned to occur in tandem with or subsequent to realignment of Tiedeman to the west away from the North Dakota-Greenburg Road intersection.

The North Dakota-Pfaffle neighborhood route and North Dakota realignment would provide a much needed east-west connection between Pfaffle and North Dakota Street over Highway 217 and would provide an alternative to Pacific Highway and Walnut Street for travel between east and west

Tigard. Traffic calming measures could be implemented to keep travel speeds consistent with a neighborhood route; however, measures to reduce traffic volumes on this route would reduce the benefit of the crossing which will cost several million dollars.

An additional roadway project is a future north-south connection between Dartmouth Street and Beveland Road. This potential connection would provide an alternative route for traffic on SW 72nd Avenue within the Tigard Triangle and may create opportunities for development on either side of the new roadway.

▶ **Step 6**

A final model run was conducted to include the results of steps 1 through 5 including currently funded projects, TSM strategies and recommendations for new projects and projects to be removed from the TSP.

▶ **Step 7**

Step 7 of the alternatives analysis included identifying the finalized package of improvements for the 2035 TSP and setting draft project priorities based on the project goals and objectives, individual project evaluations, input from the TAC, CAC, city staff and City Council.

Summaries of each of the project evaluations and the results of the step 6 model run are included in Technical Memorandum #5 in the Volume 3 Technical Appendix.

Changes from 2002 TSP

The following summarizes new projects added to the 2035 TSP that were not included in the 2002 TSP as well as projects that were in the 2002 TSP but have been modified in, or removed from, the 2035 TSP.

New Projects

In addition to new pedestrian and bicycle projects, several new transit supportive projects have been added to the 2035 TSP including the following:

► Transit Projects

- On-going planning activities with TriMet and Metro to bring high capacity transit parallel to the Pacific Highway/Barbur Boulevard corridor.
- Support for existing high activity bus stops by providing benches, shelters and real-time information.
- A bicycle hub with additional bike racks and covered bike lockers at the Tigard Transit Center.
- Local connector transit service in the Tigard Triangle and in connection with the high capacity transit planning. This service could connect the Tigard Triangle to Downtown, and/or the Washington Square Mall and potentially residential areas, and should be coordinated with other transit service.

► Roadway and Intersection Projects

- Pfaffle-North Dakota east-west connection with Hwy 217 over-crossing to provide a neighborhood route, connecting from Pacific Highway at 78th to Scholls Ferry Road, via North Dakota. Includes realignment of North Dakota at Greenburg Road to provide a continuous east-west connection. Requires purchase of an existing building.
- Traffic signal or other intersection treatment at Pfaffle Street-Hall Boulevard.
- New north-south connection in the Tigard Triangle, connecting Dartmouth with Beveland Road or Hermosa Way in order to improve local circulation within the triangle.

Updated Projects

Projects in the 2002 TSP were reevaluated to determine if changes or other updates were warranted. The following summarizes the significant updates incorporated into the 2035 TSP:

- Hall Boulevard widening, Oleson Road to Pacific Highway (Project #45a): The 2002 TSP includes a project to widen Hall Boulevard to 5 lanes in this section. The 2035 TSP includes this project as a three-lane cross-section while filling in gaps in the sidewalk and adding bikeways.
- Highway 217 Nimbus-Locust overcrossing (Project #22): The 2002 TSP identified this new roadway to have a five-lane cross-section. Due to improved multi-modal facilities and travel pattern changes in the area, the 2035 TSP includes this project with a three-lane cross-section.
- Northern Washington Square Regional Center Highway 217 crossing (Project #MUP7): The 2002 TSP identified this as a Highway 217 crossing that accommodated pedestrians, bicycles and vehicles. The 2035 TSP includes this crossing as multi-use path only that does not accommodate vehicles.

- ▶ SW 121st Avenue (Project #34) and Walnut Street widening (Project #48): The 2002 TSP included these projects as 3-lane cross-sections, while the 2035 TSP includes them both as 2-lane streets with turn-lanes where necessary, and bicycle and pedestrian improvements.
- ▶ Ash Avenue extension (Projects #18 and #27): This project includes a 3-lane cross-section in the 2002 TSP. Based on the desire to improve access and safety for pedestrians and bicycles downtown, this project is included in the 2035 TSP with a 2-lane cross-section providing turn-lanes where necessary.

A corridor analysis is also identified for these projects (#18 and #27) in order to examine design and alignment alternatives and more clearly identify the potential impacts, both positive and negative, of these projects.

Other Project Notes

Scholls Ferry Road Widening from 121st to Barrows (Project #28) has been identified for ROW preservation. The Washington County TSP shows this segment as three lanes in the future. Based on its “Long-term” designation and definition of long-term projects in the 2035 TSP, widening to seven lanes would not be conditioned upon development; however, ROW would be obtained to preserve this option for the future.

Section 5

**Transportation
System Plan**

Transportation System Plan

This section presents the multi-modal Transportation System Plan for the City of Tigard. The purpose of the plan is to support the vision and goals presented in Section 2 by logically providing for the systematic care and expansion of the city's multi-modal transportation system. The 2035 Transportation System Plan presented below provides the policy and regulatory framework to guide the expansion of the system and the prioritized list of actions and improvement projects to meet the future travel needs within the community.

The Transportation System Plan is organized into the following major sub-sections:

- ▶ State and regional planning context;
- ▶ Policy/regulatory elements for management and design of roadways;
- ▶ Future modal system plans for the roadway, pedestrian, bicycle and transit systems;
- ▶ Summary of all planned projects and project priorities;
- ▶ Transportation plans for special areas including Downtown Tigard, the Tigard Triangle and Washington Square Regional Center; and
- ▶ Modal plans for the rail, air, water and pipeline systems.

Plan Area

The City of Tigard is located within urban Washington County and the three county (Multnomah, Clackamas, and Washington Counties) Metro Service District. Tigard's current boundaries are generally defined by Scholls Ferry Road to the north, I-5 to the east, the Tualatin River to the south, and SW Barrows Road and extend as far as SW 154th Avenue to the west.

Figure 5-1 presents a map of the area included in the Tigard 2035 Transportation System Plan which includes the City of Tigard and sections of unincorporated Washington County that are part of the Tigard Urban Planning Area. These unincorporated areas are required to be included in the 2035 TSP by the Transportation Planning Rule. The Highway 217 interchange at Scholls Ferry Road is also shown in the figure even though it is in the City of Beaverton, but is included in this study because its operations effect adjacent intersections within Tigard.

West of the Tigard planning area is the West Bull Mountain Planning Area (Areas 63 and 64) which was brought into the urban growth boundary in 2002. That area is being planned under a separate effort being led by Washington County and is, therefore, excluded from the Tigard Planning Area of this TSP.

Figure 5-1 Transportation System Plan Boundaries

Tigard Urban
Planning Area

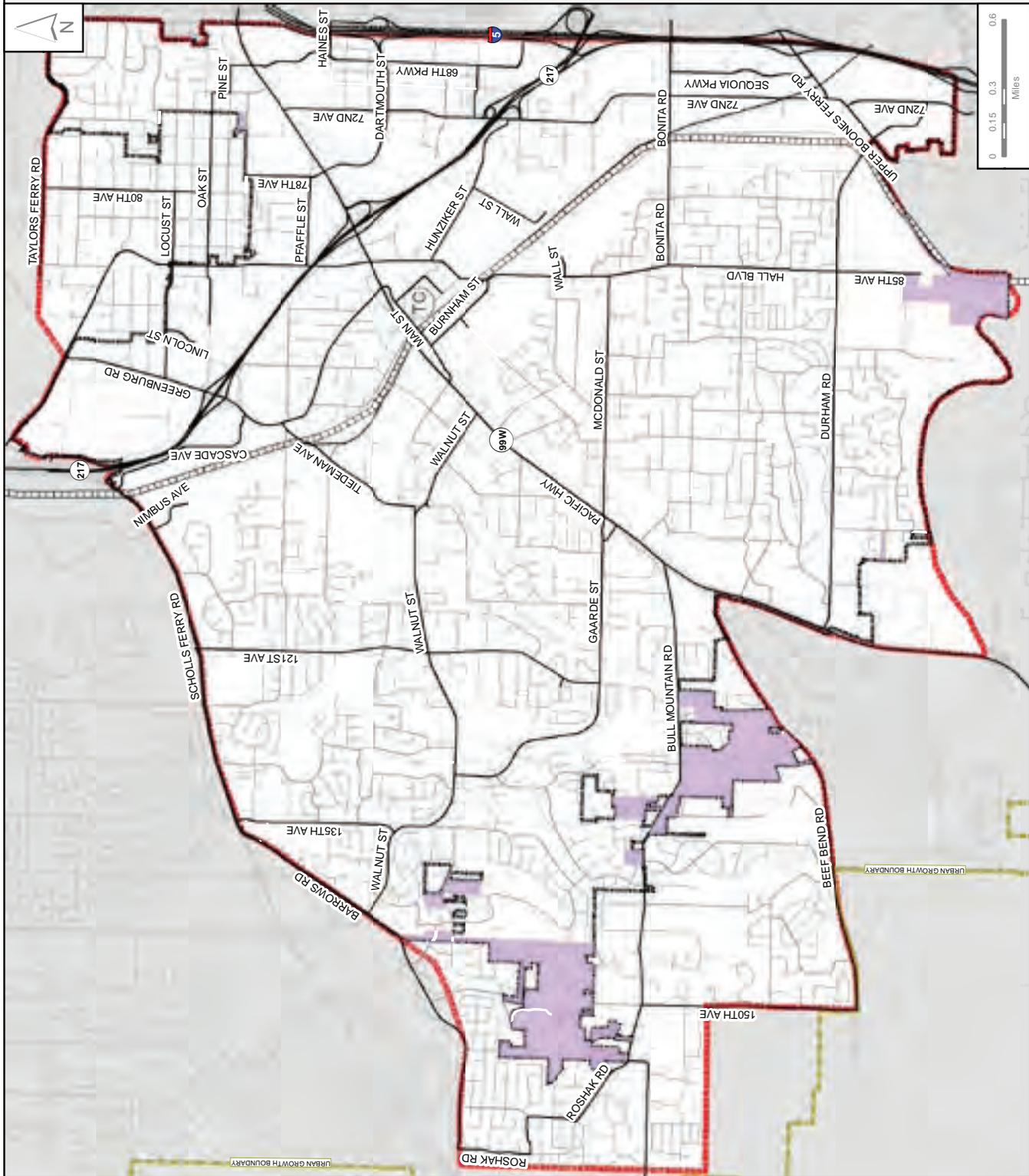
-  Tigard City Boundary
-  Urban Planning Area
-  Recent City Annexations

Other Map Elements

-  Transit Center
-  Other Rail Lines



** The information represented on this map is current as of December 23, 2010. Revisions will be made as new decisions or amendments occur to alter the content of the map.



State and Regional Planning Context

While the focus of the 2035 Tigard Transportation System Plan (2035 TSP) is the transportation system within the Tigard Urban Planning Area, the transportation facilities within the 2035 TSP area also have an important role in the state and regional transportation system. In keeping with Goal 5 for the 2035 TSP regarding inter-agency coordination, the 2035 TSP is consistent with the requirements of statewide and regional transportation plans and policies.

► Facilities

Three major regional transportation facilities traverse the City of Tigard: Interstate 5, Highway 217 and Pacific Highway. These facilities are state highways under the jurisdiction of the Oregon Department of Transportation (ODOT) and are subject to the operational and design requirements placed by the state. Plans for improvements to the highways and interchanges, as well as changes to adjacent land uses and access points must be developed in a manner consistent with ODOT plans, guidelines and standards.

Further, each of these facilities delineates a regional mobility corridor in Metro's 2035 Regional Transportation Plan (RTP) (Reference 2). The corridors, while anchored by major roadway facilities, also encompass local streets and multi-modal facilities. Metro's Mobility Corridor Atlas identifies the following four corridors connecting to Tigard:

- **Corridor 2 North:** includes the area surrounding I-5 and Pacific Highway connecting Tigard to Portland Central City. This corridor area includes I-5 between Portland and Tualatin, and Pacific Highway between Portland and King City.
- **Corridor 3 South:** includes the area surrounding I-5 and Pacific Highway, connecting Tigard to Tualatin, Wilsonville and Sherwood.
- **Corridor 19:** includes the area around Highway 217 connecting Tigard to Beaverton and Hillsboro (via Highway 26) as well as Lake Grove to the east.
- **Corridor 20:** includes the area surrounding Highway 99W connecting Tigard to Sherwood and Newberg, as well as Tualatin and portions of Wilsonville.

By identifying and managing multi-modal corridors, Metro is shifting transportation planning away from a focus on facilities and toward a focus on providing connections using a system of modal options. *A Metro summary of existing conditions for each of these Regional Mobility Corridors is provided in Appendix C of the Volume 2 Technical Appendix.*

Multi-modal refinement plans for each of these corridors are included in the 2035 RTP. Metro has identified Corridor 2 as one of two top priority corridors for refinement plans and is seeking funding to begin this effort.

Land Use Planning and Development

The types and intensities of land uses are closely correlated with travel demand and mode choice. Land use patterns in the City of Tigard and surrounding areas are suburban in character, with residential areas separated from commercial areas and a relatively low density of development overall. The majority of land in Tigard is zoned for residential uses, with commercial zoning primarily along Pacific Highway and in the

Tigard Triangle, and industrial primarily along the WES commuter rail track south of Pacific Highway. This development pattern results in travel demand that is highly directional according to typical weekday peak periods. Specifically, there are relatively sharp peaks in travel demand during weekday commute hours, with predictable peak period traffic flowing away from residential neighborhoods in the morning and returning in the evening.

Land use strategies that support non-automobile travel choices while retaining the suburban residential character throughout most of Tigard are described below.

▶ **Potential Further Plan or Study: Support Commercial Nodes in Residential Areas**

Commercial nodes in residential areas would provide residents with the opportunity to take non-work trips by bike or walking. These neighborhood commercial (N-C) nodes could include small restaurants, coffee shops or neighborhood retail. This could be accomplished by allowing neighborhood-commercial as a permitted or conditional use in residential zones, or through designating specific nodes on the city's comprehensive plan map as neighborhood commercial. The N-C designation currently exists within the city.

▶ **Potential Further Plan or Study: Support Non-auto-dependent Development**

Mixed-use developments combine housing, retail, employment and other land uses together in a single development project. Such developments have been found to reduce automobile trips by supporting higher frequency transit service and promoting pedestrian and bicycle travel. Urban areas with mixed uses and higher densities should be promoted in targeted areas, such as in the Downtown Tigard², along Pacific Highway, and in the WSRC. Non-auto-dependent development can be encouraged through various policies such as parking management requirements, density requirements or bonuses, and/or pedestrian, bicycle or transit mode design guides to integrate non-auto mode features and incentives directly into development.

▶ **Plan Amendments and Mobility Standards**

Several land use strategies are identified in Section 3 as measures to help reduce traffic congestion resulting from single occupancy vehicle (SOV) travel. These land use strategies are also important in order to support transit investments, including the Southwest Corridor high capacity transit (HCT) service in Tigard. In particular, transit supportive land uses tend to include higher densities and mixed uses, as well as design elements that make walking and bicycling safe, convenient and comfortable.

Amending Tigard's existing zoning to allow higher density developments may present challenges with respect to meeting ODOT performance standards for adjacent state highways. The Transportation Planning Rule (OAR 660-12-0600) which requires that amendments to adopted plans must not cause an affected roadway to fail to meet performance standards, or if the forecast roadway operations are already failing to meet performance standards, the plan amendment must not further degrade performance.

²The city's comprehensive plan includes considerably higher residential densities in Downtown, which were not reflected in the Metro model.

This is a known issue in downtown, Washington Square Regional Center, along Pacific Highway, and in the Tigard Triangle, and may also arise in other areas near state highways or freeway interchanges. There are numerous measures that can be taken in the land use planning and design process to reduce trip generation from increased development. These include:

- ▶ Parking management, including pricing and time limits;
- ▶ Reduced parking requirements or parking maximums for new development;
- ▶ Improved facilities for pedestrian and bicycle access and circulation;
- ▶ Complementary mix of land uses;
- ▶ Improved connectivity for motor vehicles as well as for bicycles and pedestrians; and
- ▶ Transportation system management (TSM) measures to improve traffic operations without significant capacity expansions.

The above measures are an effective approach to reducing traffic impacts from increased development. Additional transportation mitigations are primarily focused on improving general transportation conditions for all travel modes. While these measures may be pursued for their own merit, they are also identified as an option for transportation mitigations where increased density results in higher trip generation:

- ▶ Access management to improve general traffic operations on arterials and collectors; and
- ▶ Mitigation of known safety and access deficiencies for motor vehicles, transit, pedestrians and/or bicycles.

The city will continue to work with Metro and ODOT to develop transportation and land use strategies that support Tigard transportation and community development goals, Metro's 2040 growth concept and ODOT performance standards.

▶ **Greenhouse Gas Emissions**

In 2007, the Oregon legislature adopted the following statewide targets for greenhouse gas emissions (GHGs) among all sectors, including energy, solid waste, buildings and transportation:

- ▶ 2010: stop increases in GHG emissions
- ▶ 2020: ten percent reduction in GHG emissions (from 1990 levels)
- ▶ 2050: fifty percent reduction in GHG emissions (from 1990 levels)

This was followed by the adoption of House Bill 2001 (Jobs and Transportation Act, or JTA) in 2009, which focuses on reducing GHG emissions from light-duty vehicles. The technology and methodology to measure GHG emissions for specific transportation plans and projects is still under development. These next steps have been adopted by the legislature and by Metro as a priority for further transportation planning activities.

Successful GHG reductions can result from reducing vehicle miles traveled (VMT) per capita; increased transit, bike, and pedestrian travel; and shorter trips due to compact, mixed-use development. The City of Tigard incorporates these concepts and objectives in the 2035 TSP and actively seeks opportunities for their fulfillment in Downtown Tigard, WSRC, Pacific Highway corridor and Tigard Triangle.

Policy/Regulatory Elements

The following section includes the policy and regulatory elements of the transportation system that guide development review and project development in Tigard.

► **Functional Classifications**

The functional classification of a roadway defines the primary role in terms of providing mobility and access. An individual street's classification directs the design and management of the roadway, including right of way needs, the number of travel lanes and other cross-section elements, and access management standards. Figure 5-2 shows the functional classification for each roadway in Tigard. Within the Downtown Mixed Use Central Business District, the functional classification is further refined by the street character types shown on Figure 5-2A. The character types are implemented through special street design standards. In addition, Figure 5-2A identifies future roadways which are intended to provide an enhanced network of pedestrian-friendly streets in the Downtown area. The City of Tigard functional classification policies include the following designations:

- Freeway
- Principal Arterial
- Arterial
- Collector
- Neighborhood Routes
- Local Streets

► **Freeway**

Freeways are state facilities that provide the highest level of regional mobility and connectivity. These roadways usually extend across several jurisdictions and are often characterized by limited access points and high travel speeds. In Tigard, I-5 and Highway 217 are access controlled freeways.

► **Principal Arterials**

In Tigard, principal arterial streets are major state facilities that provide a high level of regional mobility and connectivity, provide access to freeways via interchanges, but also serve local trips to and from major commercial, residential, industrial and institutional areas. Principal arterial streets maintain mobility as a priority. Access control is very important on principal arterials although full freeway access control is not feasible due to the need to provide access to the arterial and collector street system. In Tigard, Pacific Highway is a principal arterial street.

► **Arterial Streets**

Arterial streets serve to connect and support the freeway and principal arterial system. These streets link major commercial, residential, industrial and institutional areas. Arterial streets are typically spaced about one mile apart, and maintain mobility as a priority. Access control is important on arterial routes, but not to the extent of principal arterial systems. Many of these routes connect to cities surrounding Tigard and commonly provide access to freeways via interchanges.

▶ **Collector Streets**

Collector streets provide access and mobility within and between residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of an intra-city circulation function, do not require as extensive control of access (compared to arterials), and provide access to residential neighborhoods. These roadways distribute trips to and from the neighborhood and local street system.

▶ **Neighborhood Routes**

Neighborhood routes are usually longer than local streets and provide connectivity to collectors or arterials. Neighborhood routes have greater connectivity and are used by residents in the area to get into and out of the neighborhood, but do not serve citywide/large area circulation. Traffic from cul-de-sacs and other local streets may connect to neighborhood routes for access to higher order streets.

▶ **Local Streets**

Local streets have the primary function of providing access to immediate adjacent land. These streets typically have several driveways and are not intended for long-distance trips. Through traffic on local streets is discouraged by design.

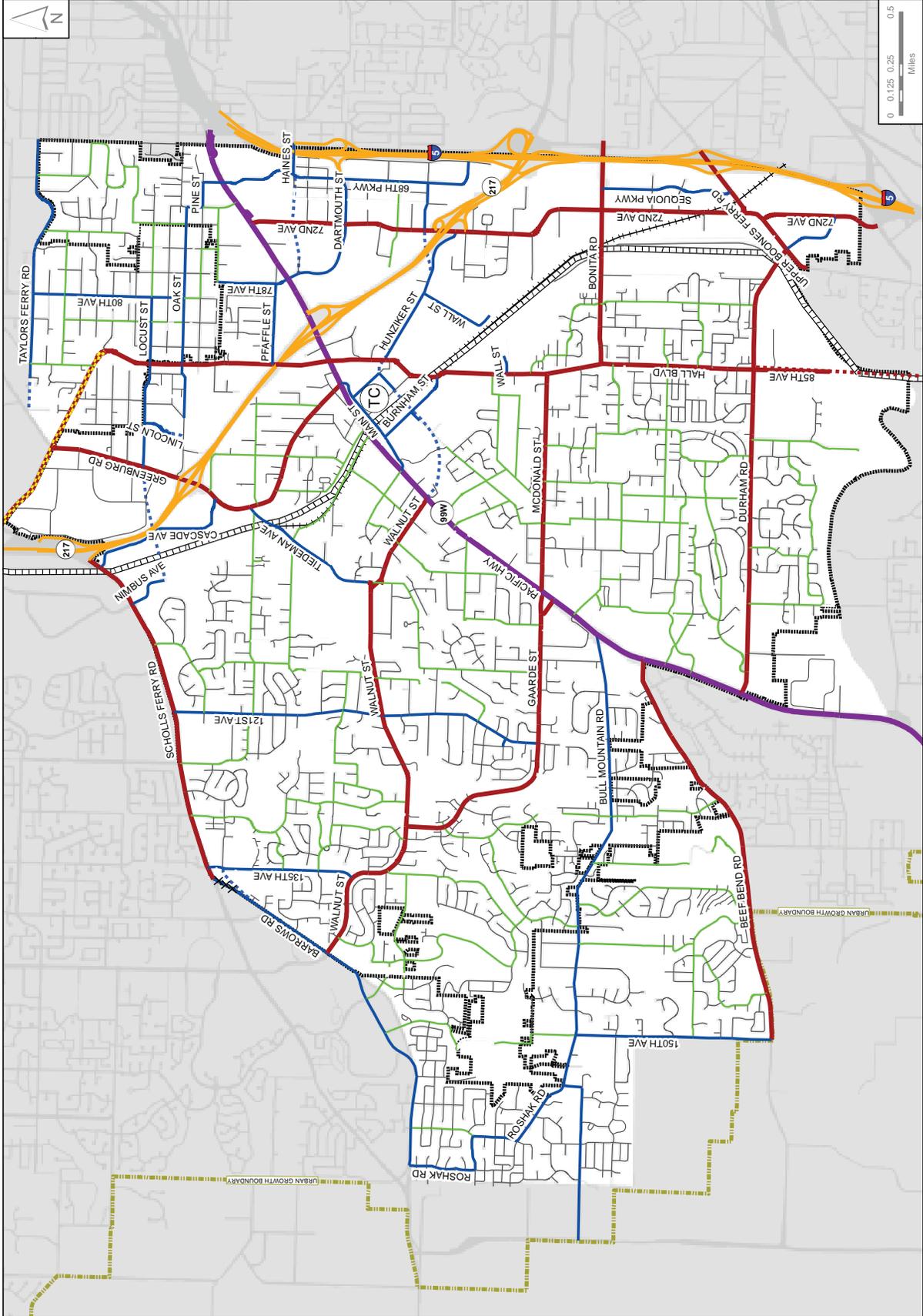
Truck Routes

Freight trucks need to travel to and from the freeway system to their destinations. The state and local agencies designate truck routes to help channelize freight traffic to the most desirable routes for trucks and to ensure that the system is designed to accommodate necessary freight movement. Interstate 5, Highway 217 and Pacific Highway are designated statewide freight routes, while Hall Boulevard, Beef Bend Road, Scholls Ferry Road, Upper Boones Ferry Road and sections of Durham Road and 72nd Avenue are City of Tigard designated freight routes. Figure 5-3 shows the designated freight routes in Tigard.

Figure 5-2

Roadway Functional Classification

- Tigard Urban Planning Area
 - Freeway
 - Principal Arterial
 - Arterial
 - Collector
 - Neighborhood
 - Local
 - Special Transportation Area (STA)
 - Future Roadways
- Other Map Elements**
- Transit Center
 - Tigard City Boundary
 - Other Rail Lines



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**Figure 5-2a
Downtown Street Character
Types**

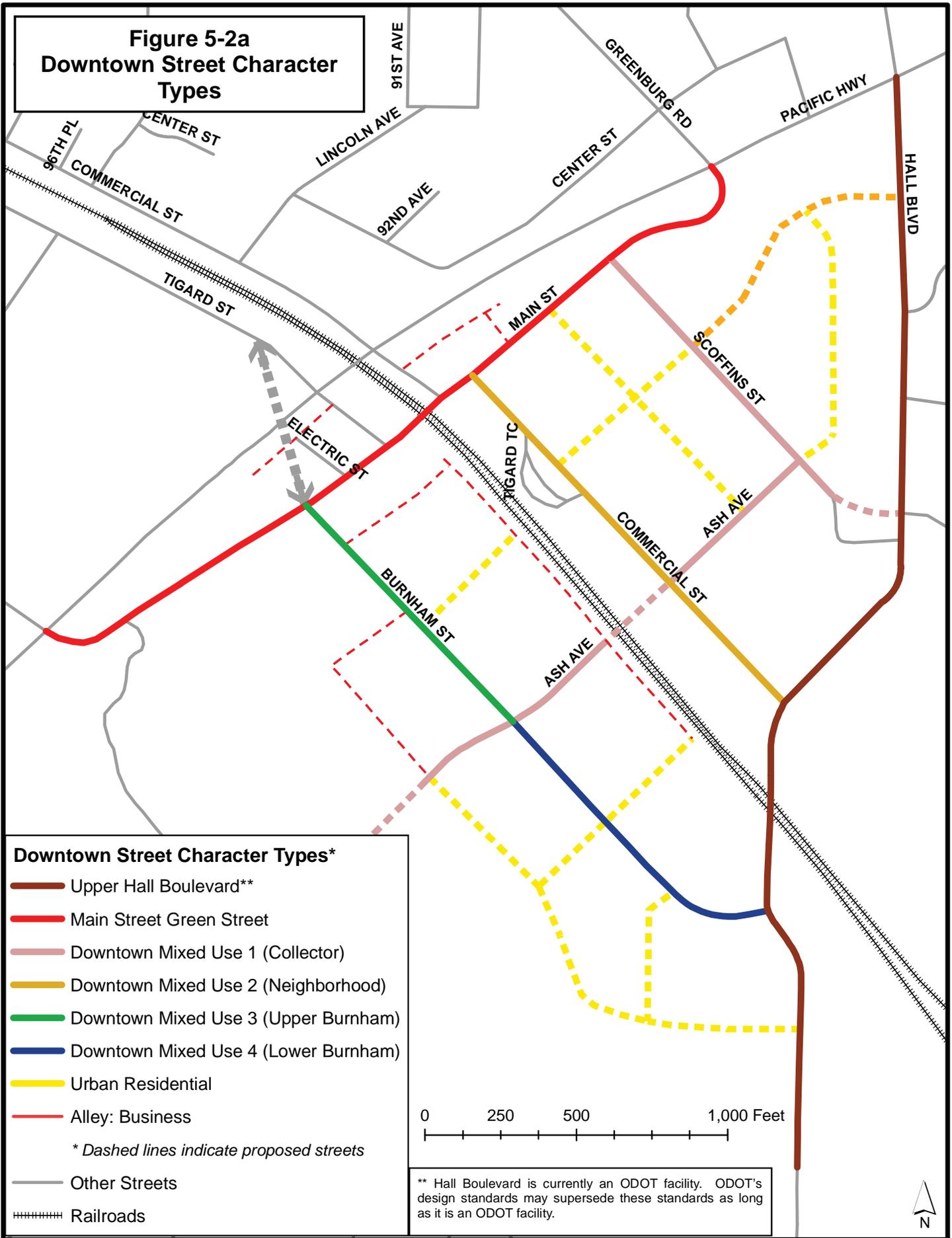


Figure 5-3

Truck Routes

Tigard Urban Planning Area

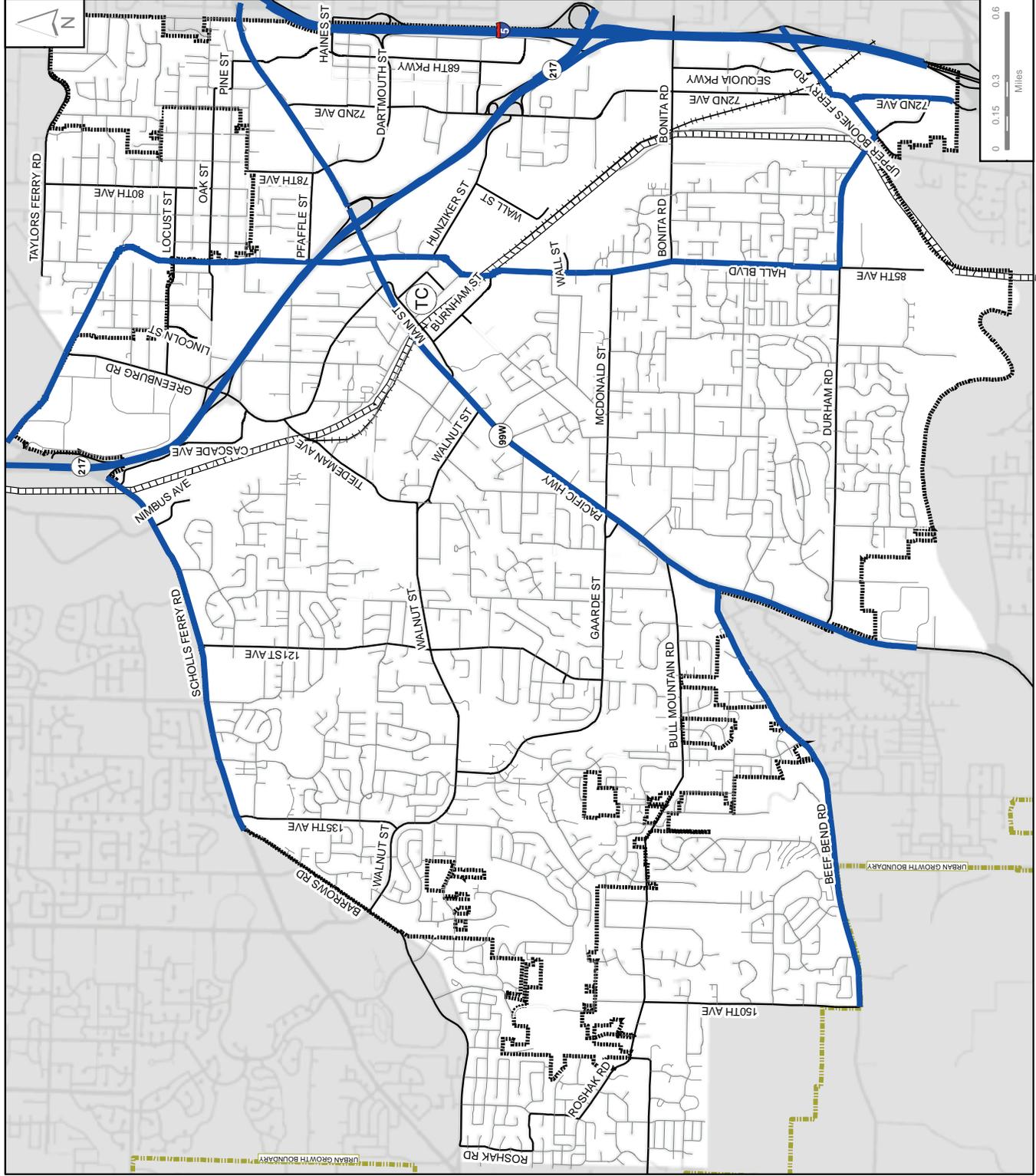
Truck Routes

Other Map Elements

Transit Center

Tigard City Boundary

Other Rail Lines



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This system provides connections with truck routes serving areas within and outside of Tigard making efficient truck movement and the delivery of raw materials, goods, services and finished products possible. These routes are generally found in and serve areas where there are concentrations of commercial and/or industrial land uses. The highest non-freeway truck volumes in Tigard are on Pacific Highway. In addition, Scholls Ferry Road, Hall Boulevard and 72nd Avenue also carry relatively high truck volumes.

Street Design Standards (Cross Sections)

Roadways in Tigard are the primary means of mobility for residents, serving the majority of trips over multiple modes. Pedestrians, bicyclists, public transit and motorists all use public roads for the vast majority of trips. Therefore, it is increasingly important to plan, design and build new roadways in a manner that improves multi-modal access and mobility.

The City of Tigard street design standards ensure that all new streets are constructed as “complete streets” and include facilities for pedestrians and bicycles and also provide drainage and landscaping where appropriate. Because they are reviewed and updated periodically, the City of Tigard’s street design standards are located in the city’s Community Development Code Chapter 18.810 *Street and Utility Improvement Standards*.

▶ Pedestrian and Bicycle Facilities

The typical roadway cross sections include the following elements: right-of-way, number of travel lanes, parking, bicycle and pedestrian facilities, and other features such as landscape strips. The standards represent the preferred cross-sections for each roadway designation and should be the minimum for new roadways and reconstructed roadways with adequate space available. All roadway improvements should include provision of sidewalks and bicycle facilities per the street design standards.

▶ Landscape Requirements

Street design standards in the Community Development Code (section 18.810) include landscaping requirements intended to mitigate the environmental and visual impacts that transportation infrastructure has on the surrounding community. All new and improved roadways are required to include street trees and landscaping consistent with guidelines in the development code and should consider incorporating public art, bioswales and other aesthetic/environmental treatments that improve livability and protect the environment.

▶ Potential Further Plan or Study

Review and update, as warranted, street design standards for efficient multi-modal access and circulation. Specific design standards already identified for the Tigard Triangle, Washington Square Regional Center, Pacific Highway and Downtown Tigard should be included that have been adopted as part of area plans. These should be consulted when working within these areas.

Intersection Performance Standards

Traffic conditions at intersections are typically measured in terms of their ability to accommodate traffic demand (volume-to-capacity, or v/c ratios) and the average delay experienced by drivers (level of service, or LOS). Performance standards for intersections are established by the agency with ownership over the roadway.

Intersections on state facilities (Pacific Highway, Hall Boulevard, segments of Scholls Ferry Road and freeway ramp intersections) are identified in the Oregon Highway Plan (OHP). Washington County should be consulted for standards for county roadways. The City of Tigard street improvement standards are provided in 18.810 of the development code.

► **Alternative Mobility Standards**

The City of Tigard shares the state and regional goals of providing a balanced transportation system that reduces reliance on automobiles. Among the highly effective strategies to achieve this goal are land use strategies that promote compact urban form that encourage walking, cycling and transit use. At the same time, intersection performance standards are linked to trip generation and limit the development potential of an area. In this way, the intersection performance targets can effectively preclude the land use strategies needed to support the multi-modal transportation goals.

At this writing, Metro and ODOT are working with local jurisdictions to develop strategies that meet the land use vision within the requirements of the state Transportation Planning Rule (TPR). The City of Tigard is participating in these discussions which are aimed at identifying alternative mobility standards that will protect the function of the state highways as well as other state and regional transportation goals. The city further recognizes that the quality of a transportation system can be measured in many ways, including reliability, safety and multi-modal mobility.

► **Potential Further Plans or Studies**

Alternative mobility standards are one anticipated outcome of the regional mobility corridor refinement plans identified in the RTP.

Safety

Transportation has no higher objective than safety. Historic crash data from roadways within Tigard reveal that the highest crash locations are consistently on state or county roads, including Pacific Highway, Scholls Ferry Road, and the Highway 217 and I-5 ramp intersections. Such data were used as a key criterion in the evaluation of potential improvement projects for the 2035 TSP.

In addition to including safety issues as a primary factor in identifying and prioritizing transportation investments, safety considerations are incorporated in the city's design standards for transportation facilities. These include design standards for intersections, traffic control devices and street cross section elements.

ODOT and Washington County have adopted programs to identify safety deficiencies based on crash frequencies and types. The city will continue to consult Washington County and ODOT rankings for crash locations.

► Potential Future Plan or Study

Review high crash locations along with State and County safety tracking and ranking programs. Determine whether a city Traffic Safety Mitigation System is warranted as a supplement to the County and State systems.

Access Management Standards

Access management refers to a set of measures regulating access to streets, roads and highways, from public roads and private driveways. Such measures may include minimum distances between highway approaches, as well as turning movement or other restrictions. Access management is an effective means to maximize efficient traffic flow and minimize conflict points due to vehicle turning movements. Access management standards vary depending on the functional classification and purpose of a given roadway. Roadways on the higher end of the functional classification system (i.e., arterials and collectors) tend to have higher spacing standards, while facilities such as neighborhood routes and local streets allow more closely spaced access points.

Chapter 18.705 of the Tigard Development code identifies access requirements and restrictions on City of Tigard facilities. Access spacing standards for ODOT facilities should be obtained from the Oregon Highway Plan (Reference 3). Access spacing standards for Washington County facilities are identified in the county's development code under Roadway Access (501-8.5).

Connectivity

Street connectivity standards are provided in the Tigard Development code (18.810.H). The street connectivity standards are consistent with the Regional Transportation Functional Plan which requires full street connections with spacing of no more than 530 feet, with a maximum 200-foot length for cul-de-sacs. Section 18.810.040 further specifies maximum perimeter for blocks of 2,000 feet and requires that bicycle and pedestrian connections be provided at no more than 330-foot spacing. Exceptions to these requirements can be made for several reasons, including environmental or topographical constraints, or the built environment.

The roadway capacity limitations in Tigard are perhaps most pronounced for travel demand from northeast to southwest, especially along Pacific Highway. Opportunities to provide new connections are severely constrained by Highway 217, I-5, the WES commuter/freight rail line, and natural features such as Fanno Creek and Bull Mountain. With only a limited number of east-west through routes, there is considerable demand placed on a few roadways. Adding capacity to Pacific Highway is not desired because of the significant impacts to the community in terms of added through traffic, impacts to adjacent properties, and the greater physical barrier through the city. As such, a higher priority is placed on providing new connections that can work in concert with the principal and major arterial system.

In addition to the citywide connectivity issues, many neighborhood streets systems in Tigard are characterized by cul-de-sacs and stub streets. Cul-de-sacs and stub streets are often desired by residents because they can limit traffic speeds and volumes on local streets. However, they also result in indirect travel paths, longer trips (i.e. increased vehicle miles traveled), limitations to pedestrian and bicycle mobility, and a reliance on arterials for local trips.

The most efficient transportation network is the traditional grid system, which provides multiple route alternatives between origin/destination pairs. The connectivity barriers posed by I-5, Highway 217, the rail line, Fanno Creek, and Bull Mountain, combine with the built environment to make development of such an efficient network impracticable. However, incremental improvements can be achieved and should be sought. At the same time, opportunities to provide alternative routes to accommodate local travel on local or collector streets should be done carefully and thoughtfully so as not to have unforeseen negative impacts such as cut-through travel on undesired routes.

Connectivity improvements for pedestrian/bicycle networks are also effective enhancements to the transportation system. Bicycle and pedestrian connectivity is important to make these travel modes more convenient and efficient. The recently adopted Tigard Neighborhood Trails Plan identifies 42 off-street trail projects to improve connectivity and reduce out-of-direction travel. These projects will enhance informal route connections to improve non-motorized route options.

► **Potential Further Plans or Studies**

Conduct a citywide connectivity and circulation study to identify potential circulation improvements for street systems serving Tigard.

Create a comprehensive inventory of street stubs, unimproved right-of-way and other potential future roadway connections. Establish a priority ranking system based on cost, barriers to improvement, benefits for circulation, and potential other uses.

Review and update/clarify, as warranted, development code requirements for new roadway or pedestrian/bicycle connections as part of land development.

Transportation System Management and Operations

As part of its 2035 RTP, Metro has a regional Transportation Systems Management and Operations (TSMO) Plan that identifies TSMO strategies for facilities within Tigard. The TSMO Plan includes implementation of Active Corridor Management (ACM) on several major corridors within and through the city, which will improve traffic flow by expanding traveler information and upgrading traffic signal equipment and timing. Additional strategies will include signal enhancements that detect and prioritize transit vehicles at signalized intersections.

The access management and TSM strategies planned in Tigard are summarized in Table 5-1. These include strategies identified in the Metro TSMO Plan, RTP Update, the Tigard 99W Improvement and Management Plan (Highway 99W Plan) and the 2002 TSP.

TABLE 5-1: POTENTIAL TSM STRATEGIES FOR TIGARD		
Roadway	Strategy	Source
Highway 217	Variable Speed Limits, Variable Message Signs, Shoulder Widening	Highway 217 Interchange Plan
	Transit Priority treatments	Metro Draft TSMO Plan
Pacifi Highway	Active Corridor Management, including upgrade of signal controllers, wireless detection and updated timing plans.	Currently underway by ODOT/city
	Transit priority, with queue bypasses at several locations	Highway 99W Plan
	Access management	Highway 99W Plan
	High capacity transit	Regional High Capacity Transit System Plan
Scholls Ferry Road	Install integrated corridor management equipment.	RTP Financially Constrained Project List
	Arterial corridor management with adaptive signal timing and transit signal priority	Metro Draft TSMO Plan
Hall Boulevard	Arterial corridor management with transit priority	Metro Draft TSMO Plan
	Access management	Tigard 2002 TSP
72nd Avenue	Arterial corridor management	Metro Draft TSMO Plan
Durham Road	Arterial corridor management	Metro Draft TSMO Plan

The complete list of TSMO projects for the Regional Mobility Corridors in Tigard are provided in Appendix D of the Volume 2 Technical Appendix.

Travel Demand Management

Travel Demand Management, or Transportation Demand Management (both TDM) measures include any method intended to shift travel demand from single occupant vehicles to non-auto modes or carpooling, travel at less congested times of the day, or help people reduce their need to travel altogether. Given the significant motor vehicle capacity deficiencies under forecast conditions, an increase in transit, walk and bike mode shares is as essential to the future transportation system in Tigard as adding roadway capacity. Further, effective TDM measures would help reduce the scope and scale of the deficiencies.

While many TDM strategies are most effectively implemented by employers, there are numerous strategies that cities can implement or support with other agencies. These include the provision of facilities (sidewalks, bicycle lanes, transit amenities) and management of existing resources (parking). Another critical role that cities play is in the policies related to development activities. Through support, incentive, and mandate, cities can ensure that new development supports a balanced transportation system. Several broad TDM strategies are summarized in Table 5-2. The table also identifies typical implementation roles.

TABLE 5-2: TDM STRATEGIES AND TYPICAL IMPLEMENTING ROLES

TDM Strategy	City	Transportation Management Association	Developers	Trimet	Employers	Metro	State
Public Parking Management	P		S	S	S		
Flexible Parking Requirements	P		S		S		
Access Management *	P					S	P
Connectivity Standards*	P		S			S	P
Pedestrian Facilities	P		S		S		S
Bicycle Facilities	P		S				S
Transit Stop Amenities	S		S	P		S	
Parking Management	P		S		S		
Limited Parking Requirements	P		S			S	
Carpool Match Services	S	P			S		
Parking Cash Out		S		S	P		
Subsidized Transit Passes				S	P	S	
Carsharing Program Support	P	S	S	S	S		

P: Primary role; **S:** Secondary/support role; *Primary implementation depends on roadway jurisdiction

The City of Tigard does not have a dedicated TDM program; however the Westside Transportation Alliance (WTA) is a TMA serving Washington County. The WTA assists employers in developing, implementing, and monitoring programs to reduce commute trips by SOV. The City of Tigard is a member of the WTA, as are most neighboring jurisdictions and many private employers. While the emphasis at WTA is to help employers create TDM programs, the WTA web site provides an “information hub” that individuals can use to find out about a myriad of travel options, including transit service, park-and-ride lots, bicycling, carpool matching and other services.

The Metro 2035 RTP includes TDM strategies including parking management, providing more bicycle facilities, and supporting Transportation Management Associations (TMAs). The TDM projects in the Metro TSMO plan within Tigard include the following:

- ▶ Individualized marketing in the Tigard Town Center (Downtown) and adjacent neighborhoods to encourage travel options through delivery of localized information and services;
- ▶ Support of public-private partnerships Transportation Management Associations (TMAs) in regional centers and town centers to help employees and/or residents increase use of travel options;
- ▶ Parking management at the Washington Square Regional Center and in Downtown; and
- ▶ Bike sharing at transit-oriented developments, large employers, colleges, hotels and significant transit stops in the Beaverton to Tigard Corridor.

The complete list of TSMO projects for the Regional Mobility Corridors in Tigard are provided in Appendix D.

Travel Mode Share Targets

As noted in the Transportation Planning Toolbox discussion, improvements in local connectivity, transit availability and parking management, including pricing, are some of the factors that will reduce the reliance on single occupant vehicle (SOV) travel, and support more active transportation choices. These changes are consistent with Tigard’s land use and transportation objectives. As such, Tigard has developed Aspiration Maximum SOV targets that are more ambitious than the 2040 Growth Management targets. These are summarized in Table 5-3.

TABLE 5-3: CITY OF TIGARD TRAVEL ASPIRATION MODE SHARES						
Area	Metro 2040 Max SOV* Target	Aspiration Maximum SOV	Illustrative Non-SOV Shares			
			Carpool	Transit	Walk	Bike
Citywide	40–50%	50%	39%	5%	4%	2%
Washington Square Regional Center	45–55%	40%	35%	10%	10%	5%
Tigard Town Center (Downtown)	45–55%	40%	35%	10%	10%	5%
Durham Road Town Center	45–55%	45%	39%	8%	5%	3%
Tigard Triangle	55–60%	45%	39%	8%	5%	3%

**SOV = single-occupant-vehicle*

As shown in Table 5-3, Tigard aspires to achieve a lower SOV share for the designated 2040 Centers as well as in the Tigard Triangle. These are provided as “aspiration” and “illustrative” shares, rather than targets, for the following reasons:

- ▶ Metro modified its definition of SOV with the 2035 Update. In the 2004 RTP, a parent traveling with a child was considered an SOV; in the 2035 RTP Update the definition was changed so that this would be counted as a carpool. However, at this writing, the mode targets had not been updated.
- ▶ There is a desire to examine the individual factors influencing mode shares prior to confirm that the 2005 mode share estimate is an appropriate base from which to measure change.
- ▶ The RTP identifies non-SOV share targets only. There is an interest in looking more specifically at other modes, including carpool, transit, walk and bike trips in order to inform transportation investments.

▶ **Potential Further Plan or Study**

Evaluate and refine current mode split estimates using the Metro travel demand model and/or direct surveys. Refine mode split targets, especially for designated centers, corridors and the Tigard Triangle.

Parking

Parking in Tigard is provided by the city as well as private property owners. Privately owned parking is typically “accessory” parking which is developed on-site in support of a specific development. Accessory parking is typically restricted to the employees, residents, customers, guests or others associated with a specific property.

▶ **Accessory Parking**

New land uses are required to provide on-site parking to accommodate their own parking demand in order to protect surrounding land uses from overflow parking impacts. The amount of parking required is expressed in the form of parking ratios in the development code (see 18.765 of the Development Code). The Tigard parking ratios incorporate minimum and maximum ratios, consistent with the requirements of the 2040 Growth Management Functional Plan.

Although the intent of parking is to accommodate all impacts on-site, accessory parking can also encourage single occupancy vehicle (SOV) travel which increases traffic volumes on the roadways. This is contrary to the multi-modal aspirations of the city. Further, surface parking requires large paved areas which negatively impact the pedestrian environment, storm water run-off and urban character, at the same time that they increase development costs and reduce development opportunities.

In some areas, it is appropriate to reduce parking minimums or to impose maximums for new development. Total parking supply could also be reduced by allowing and promoting shared parking among neighboring property owners. Tigard recently modified the development code for Downtown to remove minimum parking requirements for new developments. Reduction in parking requirements should be considered part of the overall approach to TDM and will be most effective if undertaken in conjunction with other activities, such as improved transit, pedestrian and bicycle services, and a larger role for public parking.

In addition to privately owned accessory parking, there are several park-and-ride lots serving transit routes, including the downtown transit center. The locations and ownership of the existing park-and-ride lots include the following:

- ▶ Downtown Commuter Rail/Transit Center: TriMet
- ▶ Pacific Highway at SW 74th Avenue: TriMet
- ▶ Pacific Highway at Bull Mountain Road: Christ the King Lutheran Church
- ▶ SW Hall/SW Nimbus Commuter Rail: Union Pacific right of way
- ▶ Progress (Highway 217-Scholls Ferry Road): ODOT right of way
- ▶ Tualatin (Lower Boones Ferry Road near I-5): ODOT right of way

▶ **Public Parking**

Public parking in Tigard is generally limited to curb parking on public streets. Curb parking in Tigard is most prevalent on local streets serving residences, and in downtown. Most of the parking is unrestricted, though there are some time limits for curb parking in downtown. In areas identified for more urban development character, such as downtown, it will be necessary for the city to ensure an active role in managing public parking resources to ensure that they support community and neighborhood goals.

▶ **Potential Future Plans and Studies**

Develop or update parking management plans for Downtown Tigard, Washington Square Regional Center and the Tigard Triangle.

Review and update, as warranted, parking minimum and maximum ratios in the development code, including variance opportunities and requirements.

Additional Plans and Studies

Transportation System Plans are intended to provide a high-level, broadly focused planning tool. In the development of Tigard’s 2035 TSP several issues were identified that warrant additional consideration. The results of these studies and planning efforts would implement the policies and priorities in the 2035 TSP, update the Tigard Development Code, or constitute a more detailed look at transportation issues related to a specific topic, mode or geographic area. These additional studies and plans are identified in Table 5-4.

TABLE 5-4: FUTURE PLANS & STUDIES	
Project	Purpose
Support commercial nodes in residential areas	Identify opportunities for neighborhood commercial (N-C) in residential neighborhoods to promote walk/bike trips.
Promote mixed-use compact urban form developments.	Promote mixed-use developments with a compact urban form and limited footprint in order to support an efficient transportation system. Urban areas with mixed uses and higher densities should be promoted in targeted areas, such as along Pacific Highway, in designated centers and in the Triangle.
Circulation/connectivity study and inventory	Inventory, evaluate and prioritize multi-modal connectivity gaps. Identify opportunities for improvements through development or city-initiated projects.
Update street cross section guidelines	Review, consolidate and update street cross section guidelines for general application and for Downtown Tigard, Tigard Triangle and Washington Square Regional Center.
Conduct a mode-split survey and develop a tracking plan	Develop and conduct a travel mode survey; develop a tracking plan and system.
Traffic safety mitigation system	Review high crash locations; review state and county tracking and ranking systems; determine a city system for evaluating and prioritizing safety mitigations. A desired outcome will be a partnership with the state and county.
Pedestrian crossing improvement plan	Review current pedestrian crossing challenges and identify potential improvements, including a system for prioritizing improvements.
Pedestrian system plan	Develop a city-wide pedestrian system plan.
Bicycle system plan	Develop a city-wide bicycle system plan.
Multi-modal level of service (MMLOS) analysis	Conduct a pilot project to identify current MMLOS in targeted areas; evaluate potential improvements; and investigate MMLOS operating standards for Tigard.
Multi-modal access plans for Tigard Triangle	Develop a multi-modal access inventory, assessment, and plan for future needs for the Triangle.
Multi-modal access plan for WSRC	Review and update, as needed, the WSRC Master Plan with an emphasis on multi-modal access.

Development code parking requirements updates	Review current parking minimum and maximum ratios with respect to special areas and multi-modal goals. Review variance opportunities and requirements.
Special area parking management plans	Develop or update parking management plans for Downtown Tigard, Washington Square Regional Center and the Tigard Triangle.
72nd Avenue Corridor Study	Review current plans for widening and improvements on 72nd Avenue. Identify critical constraints, barriers and opportunities. Incorporate travel demand relationship with SW Hall Boulevard.
SW Hall Boulevard Corridor Study	Review current plans for widening and improvements on SW Hall Boulevard. Identify critical constraints, barriers and opportunities. Incorporate travel demand relationship with 72nd Avenue.
Ash Avenue-Walnut Street Extension Corridor Study	Review alignment, modal, and potential phasing options for the Fanno Creek Bridge and Walnut Extension, including circulation impacts and modal benefits.
Tiedeman Alignment and Rail Crossing-Ash Rail Crossing Opportunities Study	Identify issues and opportunities for Project 12, realignment of Tiedeman with removal of railroad track crossing, and Project 17, Ash Avenue railroad crossing.

P: Primary role; **S:** Secondary/support role; *Primary implementation depends on roadway jurisdiction

Multi-modal Improvement Projects

The purpose of the Tigard 2035 TSP is to support the goals and policies presented in Section 2 by logically providing for the systematic care and expansion of the multi-modal transportation system. This TSP provides a list of improvement projects to meet the future travel needs within the community. These projects will supplement the policy and management strategies in this TSP.

Approximately 145 individual improvements were identified to address existing and future transportation needs and deficiencies. These projects were evaluated at a planning level and serve as direction for further planning of transportation investments. While some of these improvements are warranted under existing conditions, in other cases projects are identified to address the transportation needs to accommodate forecast growth. In some cases, the planning-level assessment has identified a specific proposed treatment; however, a more detailed analysis will be required to identify any environmental, topographic, right-of-way, or other construction constraints and to identify specific treatments and alignments. The identified projects include site-specific low-cost improvements, such as bicycle lanes and pedestrian crossing improvements, as well as larger scale projects (e.g., interchange improvements or freeway overcrossings) needed to address issues on state or county roadways. These larger projects will require a leadership role by state, county and/or regional partners, but would be supported by the city.

Improvement projects for the roadway, pedestrian, bicycle and transit systems are illustrated in Figures 5-4 through 5-8. Table 5-6 follows the individual modal system maps and includes the estimated project timelines and costs.

► Roadway Network

The roadway system is intended to serve all modes when built to meet current design standards. All new roads, widening or other major roadway improvements will include pedestrian and bicycle facilities consistent with the city's street standards. As such, many projects identified as roadway improvements represent significant improvements to the bicycle, pedestrian and transit systems. Figure 5-4 shows the planned roadway network, including new roadways, improvements to existing roads, and intersection projects.

The most numerous type of roadway project is the intersection improvement. These may include such treatments as traffic signals installation or modifications, roundabouts, or turn lanes. As noted above, a more detailed analysis will be required to identify specific treatments.

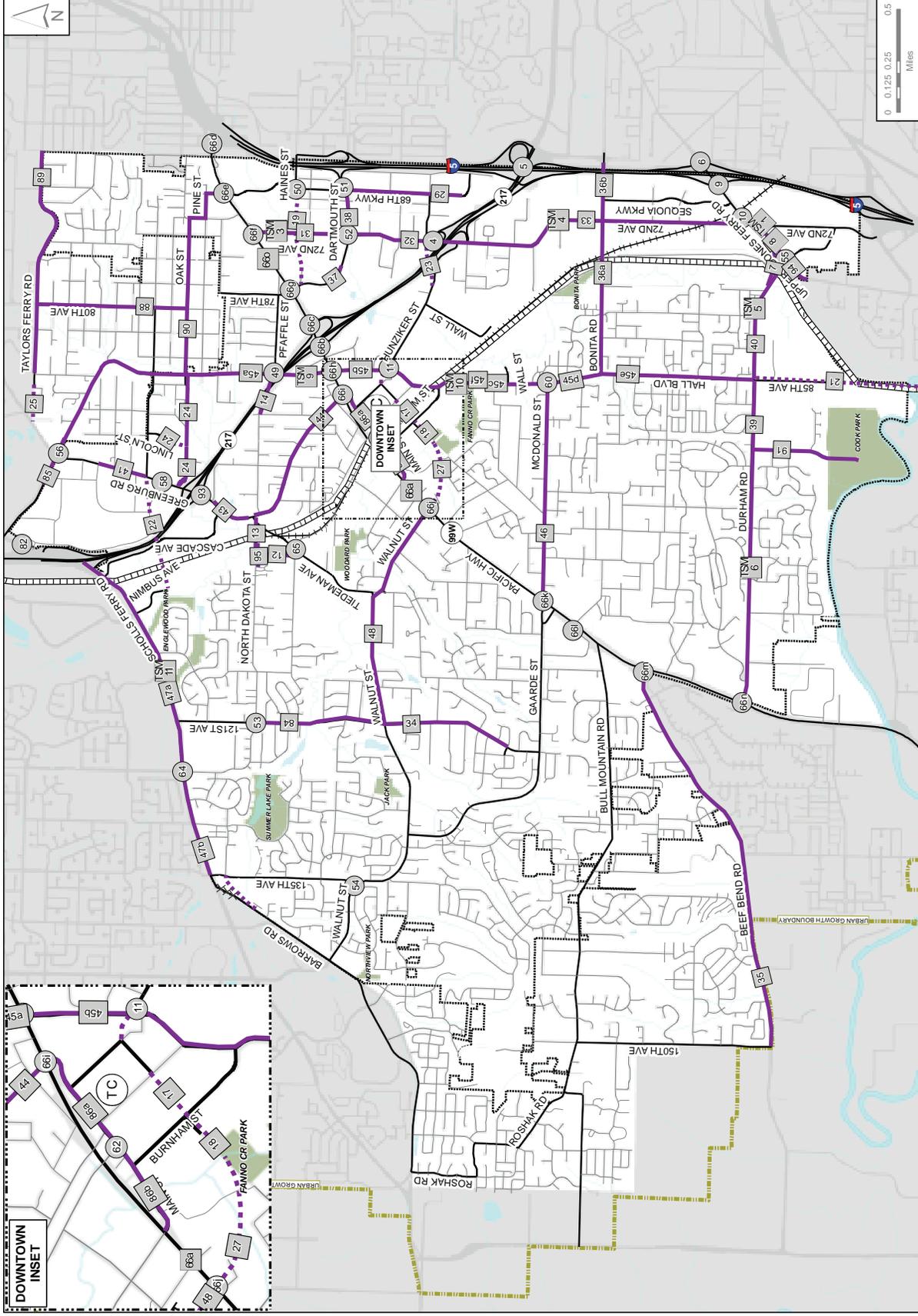
“Complete Streets” projects are those that are planned to upgrade existing streets with the inclusion of sidewalks and bicycle facilities, but without increasing motor vehicle capacity. However, any new roadway, road extension or roadway widening will also be multi-modal “Complete Street” projects that include sidewalks and bicycle facilities. Figure 5-5 shows the future right-of-way needs for existing and future roadways.

Figure 5-4

Future Roadway Improvements
Tigard Urban Planning Area

- Existing Facilities**
- Major Roads
 - Local Roads
- Future Facilities**
- Road Improvement (includes pedestrian and bike facilities)
 - New Road (includes pedestrian and bike facilities)
 - Intersection Project
 - Roadway Project

- Other Map Elements**
- Tigard City Boundary
 - Transit Center
 - Water
 - Parks



This map is provided for illustrative purposes only. The complete list of projects is provided in Tables 5-6.



** The information represented on this map is current as of December 23, 2010. Revisions will be made as new decisions or amendments occur to alter the content of the map.

Figure 5-5

Right-of-Way Needs

Tigard Urban Planning Area

- Roadway Cross-Section**
- 2 to 3 Lanes
 - 4 to 5 Lanes
 - 5 Lanes + Aux. Lanes
 - 7 Lanes

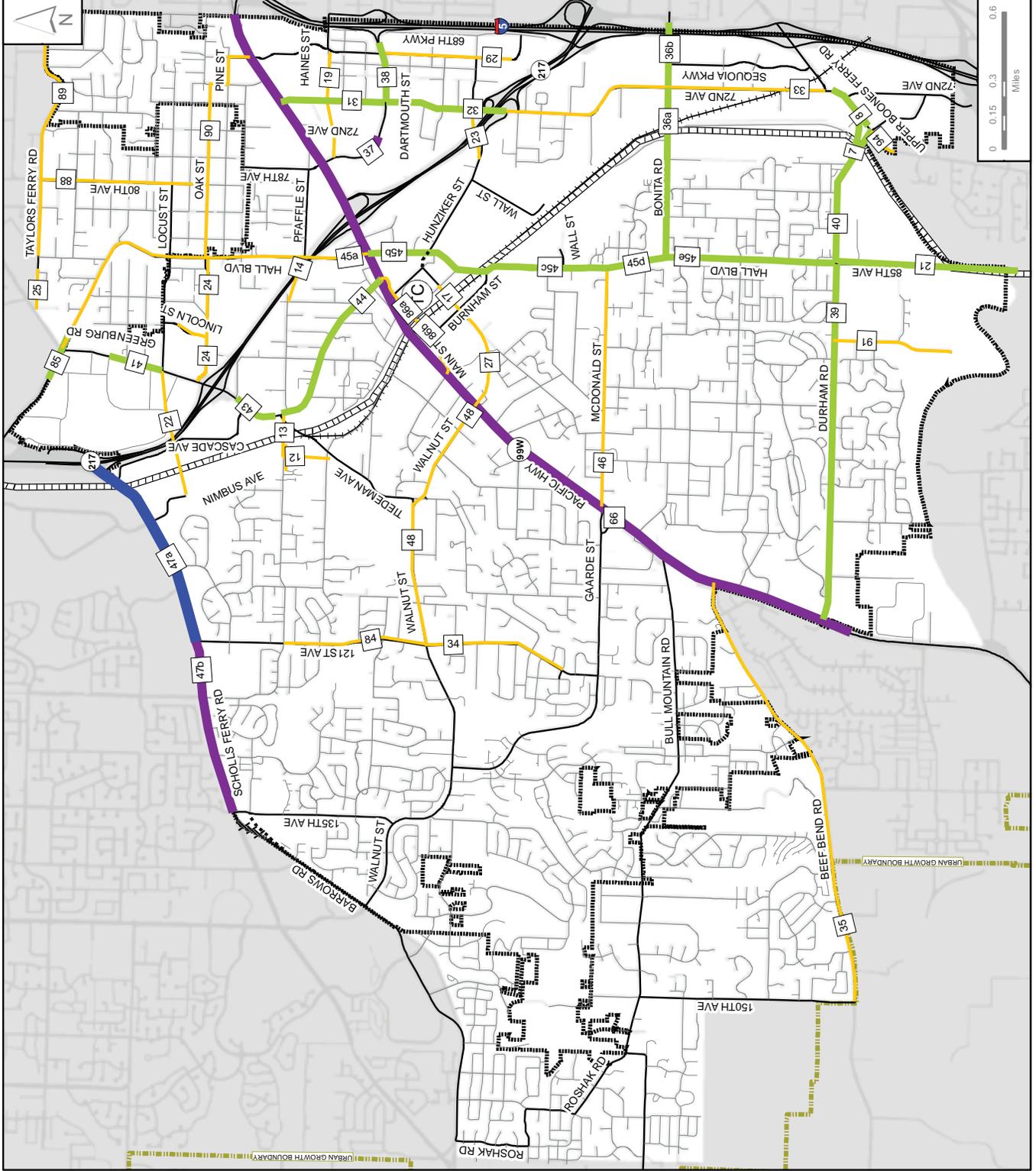
Other Map Elements

- TC Transit Center
- Tigard City Boundary
- Other Rail Lines

This map is provided for illustrative purposes. The complete list of projects is provided in Table 5-6.



** The information represented on this map is current as of December 23, 2010. Revisions will be made as new decisions or amendments occur to alter the content of the map.



► Pedestrian System

Pedestrian facilities include facilities for pedestrian connectivity (sidewalks, mixed-use trails) as well as safe crossing locations (unmarked and marked crosswalks, crossing beacons, pedestrian refuge islands). Each plays a role in developing a comprehensive pedestrian network which can promote both walking trips as well as providing access to transit. Figure 5-6 identifies the future pedestrian network which is comprised of the existing sidewalk and multi-use path networks, in addition to the network that will be developed through sidewalk projects, pedestrian crossing projects, “Complete Street” and roadway capacity projects (all of which will include sidewalks), and future multi-use paths projects.

The pedestrian system within Tigard includes sidewalks, multi-use paths and pedestrian only paths. Arterials and collectors in Tigard generally provide sidewalks alongside the roadway, but there are gaps in the system and locations where there are opportunities to improve pedestrian facilities. Pedestrian improvements should be prioritized based on their ability to complete connections between places that generate pedestrian trips such as schools and housing; housing and transit stops; and employment and transit stops. Multi-use path projects are discussed in a subsequent section because of their utility for both pedestrians and bicyclists.

Pedestrian crossing locations allow for walking trips to connect across busy roads or rail lines to continue along pedestrian facilities. In addition to the need for sidewalks along arterial and collector roadways, there are several high-volume roadways that bisect Tigard and need improvements to increase the ease and safety of pedestrian crossings. In particular, the rail corridor near Highway 217 in Tigard is difficult for pedestrians to cross due to infrequent crossings, which may not include proper pedestrian facilities. Access across the railroad tracks is increasingly important with the introduction of WES commuter rail service.

Several streets (Pacific Highway, Gaarde, McDonald, Bull Mountain, Bonita, sections of Hall) were identified as locations with challenging roadway crossing conditions for pedestrians. These tend to be streets with relatively high traffic volumes, but infrequent signalized intersections or other protected crossing locations. While the state of Oregon considers all unsignalized intersections legal crosswalks, driver compliance is not consistent so there are still challenges for pedestrians at these locations.

► Potential Further Plans and Studies

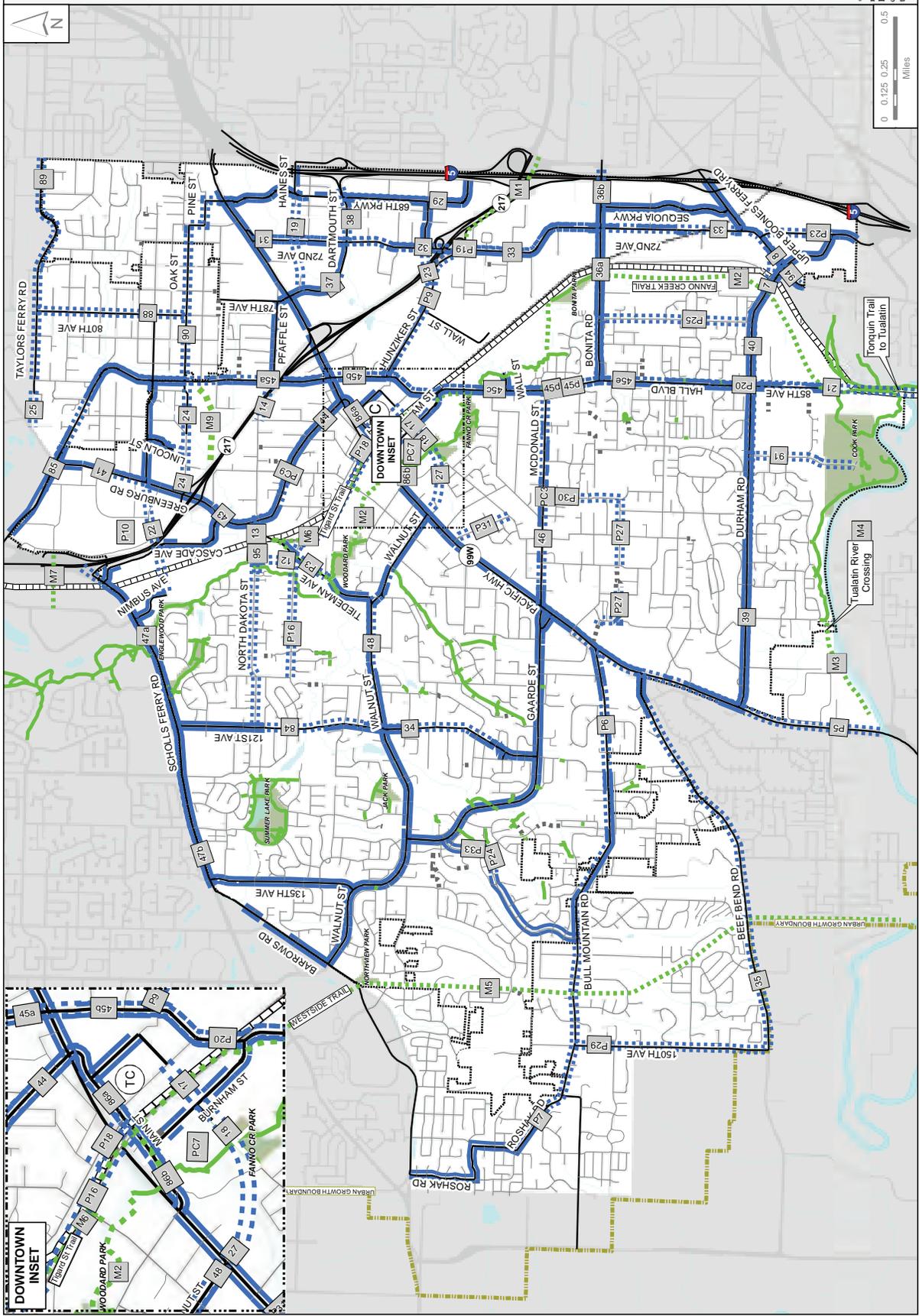
Review current pedestrian crossing challenges and identify potential improvements, including a priority ranking for improvements.

Develop a city-wide pedestrian system plan.

Figure 5-6

Future Pedestrian Network

- Existing Facilities**
- Sidewalk
 - Multi-Use Path
- Future Facilities**
- Sidewalk
 - Multi-Use Path
 - Neighborhood Path
 - Roadway Project
- Other Map Elements**
- Transit Center
 - Tigrard City Boundary
 - Water
 - Parks



This map is provided for illustrative purposes only. The information represented on this map is current as of December 23, 2010. Revisions will be made as new decisions or amendments occur to alter the content of the map.



► Bicycle System

Bicycle facilities are the elements of the network that enable cyclists to safely and efficiently travel on the transportation system. These facilities include public infrastructure (bicycle lanes, mixed-use trails, signage and striping) as well as off-road facilities (secure parking, changing rooms and showers at worksites). Some of the common types of bicycle facilities are summarized below.

- **Shared-roadway:** Any roadway without dedicated bicycle facilities is a shared roadway. In Tigard, shared roadways include all public streets without striped bicycle lanes. Where traffic volumes are low, shared roadways are generally safe and comfortable facilities for cyclists.
- **Low-Traffic Bikeway (aka Bike Boulevard):** Low-traffic bikeways are also known as bike boulevards and provide high-quality bicycle facilities on continuous street corridors with low vehicular traffic volumes. Typically, low-traffic bikeways are made on local streets, which are configured to prioritize bicycle trips and reduce through automobile trips. Local automobile access is retained. Bicycling conditions are improved by reducing stop signs to a minimum along the route and providing way-finding information specific to bicyclists. Low-traffic bikeways are best used when they parallel major roadways and can provide cyclists with a low-volume alternative route.
- **Bicycle Lane:** Bicycle lanes are striped lanes on the roadway dedicated for the exclusive use of bicycles. Typically, bicycle lanes are placed at the outer edge of pavement (but to the inside of right-turn lanes and/or on-street parking). Bicycle lanes improve bicycle safety, improve cyclist security and, if comprehensive, can provide direct connection between origins and destinations.
- **Bicycle Crossings:** Bicycle crossing treatments are used to connect bike facilities at high traffic intersections, trailheads or other bike routes. Typical treatments include bicycle detectors at traffic signals, bicycle only signals, or preferential movements for bicyclists such as only allowing bikes to make a through movement.
- **Bicycle Parking:** Bicyclists also benefit from several other types of bicycle support facilities, such as secure bicycle parking, either open or covered U-shaped racks, and storage lockers for clothing and gear. The city currently requires bicycle parking to be included in new developments as a condition of approval and TriMet buses are outfitted with bicycle racks that allow cyclists to bring their bikes with them on transit. Allowing bicycles on transit vehicles increases the range of trips possible by both transit and bicycling, and reduces cyclists' fears of being stranded in the event of a mechanical or physical breakdown.

Figure 5-7 identifies the future bicycle network which is comprised of the existing facilities as well as the network that will be developed through bicycle lane projects, bicycle boulevard projects, "Complete Street" and roadway capacity projects (all of which will include bicycle facilities), and future multi-use paths projects.

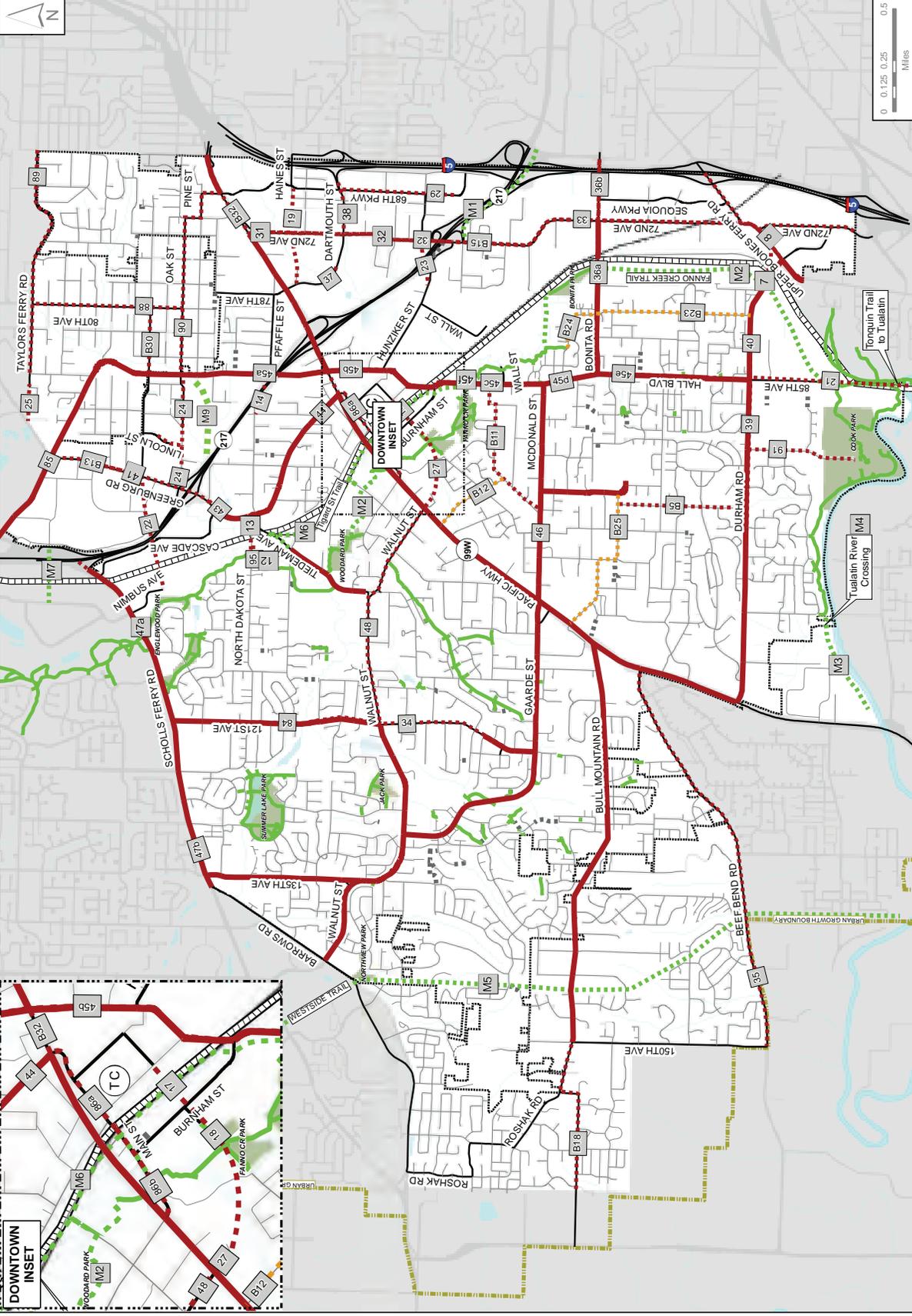
► Potential Further Plans and Studies

Develop a city-wide bicycle system plan.

Figure 5-7

Future Bicycle Network

- Existing Facilities**
- Bike Lane
 - Multi-Use Path
- Future Facilities**
- - - Bike Lane
 - - - Bike Boulevard
 - - - Multi-Use Path
 - - - Neighborhood Path
 - # Roadway Project
- Other Map Elements**
- TC Transit Center
 - Tigrard City Boundary
 - Water
 - Parks



This map is provided for illustrative purposes only. Final project details and locations are provided in Table 5-6.



The information represented on this map is for informational purposes only. Revisions will be made as new information becomes available. Decisions or amendments occur to the map will be noted on the map.

▶ **Transit System**

Transit service is an important part of a balanced transportation system, providing an alternative to private automobile travel for distances too far to walk or bike. Supporting transit as a preferred travel option for the Tigard community requires more than direct investments in transit service.

Land use, connectivity, and streetscape features have a significant influence on the cost effectiveness of transit service and will help Tigard get more out of its available transit investments. For this reason planning for land uses that are transit supportive is necessary, in addition to providing appropriate facilities and connections to transit.

▶ **Regional Rail Transit Service**

As part of the 2035 RTP Update, Metro identified the Barbur Boulevard/Highway 99W corridor as the next priority for potential high capacity transit (HCT) service, along with expanded service hours and frequency on WES commuter rail.

The City of Tigard supports the Southwest Corridor HCT priority and increased service on the existing Westside Express Service (WES) commuter rail. A local contribution to planning work for the Southwest Corridor HCT service is included in the financially constrained project list with an estimated cost of \$5,000,000. A major focus of the preliminary planning will address land uses and pedestrian/bicycle connectivity to support transit investments.

▶ **Tigard Transit Connector**

As development revives and accelerates in Downtown and in the Tigard Triangle, and in connection with the upcoming Southwest Corridor HCT service, the City of Tigard will evaluate implementation of a local connector transit service. This service could connect residential neighborhoods with the Tigard Triangle, Downtown Tigard and/or the Washington Square Mall in order to accommodate local access and connections to regional transit. The service should have schedules coordinated with other transit service (e.g. WES and Tri-Met bus service) to and from Tigard.

Table 5-5 shows several strategies and potential improvements for Transit service in Tigard. The table identifies which entities would be in a primary role (identified with a “P”) and which would be in a support role (identified with an “S”). As the major transit provider in the region, TriMet would be the Primary implementer of most of the service enhancements. In most cases, the City of Tigard is in a Support role for direct transit enhancements and a Primary role for transit supportive infrastructure.

TABLE 5-5: TRANSIT STRATEGIES AND TYPICAL IMPLEMENTING ROLES

Improvement	City	TriMet	Beaverton	Washington County	Metro	ODOT
Increase WES frequencies and days of service	S	P	S	S	S	S
Support high capacity transit (HCT) service along/parallel to Pacific Highway	S	P		S	S	S
Provide a new Tigard Connector service	P	S	S			
Improve Transit stop amenities	S	P			S	
Create a bike hub at the Downtown transit center	P	S				

P: Primary role; **S:** Secondary/support role

Figure 5-8 shows the future transit network. The main elements of the future transit plan include higher frequencies on the existing Westside Express Service (WES), Southwest Corridor HCT service on Pacific Highway, more transit stop amenities, a bike hub at the Tigard Transit Center, and a connector transit service. These direct service amenities are intended to be developed in conjunction with land use and pedestrian access improvements to support transit use.

Summary of Transportation Projects

The projects illustrated in Figures 5-4 through 5-8 are summarized in Table 5-6. Table 5-6 shows all of the projects that were identified to address existing or anticipated needs or deficiencies. Due to limited funding for transportation investments, it is not expected that all will be constructed. All projects will require additional engineering evaluation for cost, environmental impacts, and other constructability issues. Further, projects identified to address forecast deficiencies will need to be reevaluated to determine whether anticipated growth and associated transportation needs have been realized. Project descriptions and cost estimates should be considered preliminary and are subject to a more detailed analysis and engineering. Also, projects on ODOT or Washington County roadways are subject to the design and engineering standards of those agencies.

The projects are organized by primary travel mode; all roadway improvements will include bicycle and pedestrian facilities consistent with the city’s street cross-section standards. Projects referred to as “Complete Streets” are generally roadway upgrades that will include improvements to the travel lanes but are primarily aimed at improving pedestrian and bicycle conditions.

▶ **Project Time Lines**

The transportation projects identified in this plan address existing system deficiencies as well as forecast needs for the 2035 planning year. While the planning period is 25 years, some of the investments would significantly influence the transportation system for multiple generations in the future. Coupled with the inherent uncertainty in the process of long-range planning and the scarcity of funding for capital projects, the 2035 TSP reflects the importance of taking a measured approach in planning for future investments. The planned transportation projects have been divided into three categories: Near-term, Mid-term and Long-term. These divisions were made primarily to reflect the estimated timing of the actual need, as well as availability of project funding.

▶ **Near-term Projects**

These improvements are warranted under existing conditions or are expected to be warranted within a relatively short time frame. These improvements should be constructed as opportunities and resources allow and could be considered as potential conditions of approval for new development.

▶ **Mid-term Projects**

These improvements are expected to be warranted within the 20-year planning horizon and should be constructed as opportunities allow; some may be conditions of approval for new development.

▶ **Long-term Projects**

These projects will be needed to accommodate anticipated long-term growth. Other projects that may be warranted sooner than the 25-year planning horizon are included as long-term because the costs are significant and a long-term funding horizon is more realistic. If development occurs along the frontage of these improvements, right-of-way dedications for the ultimate improvement should be obtained; however, physical improvements including travel lanes and pedestrian and bicycle facilities should be constructed if serving a site access or system connectivity function.

▶ **Financially Constrained Project List**

In order to better reflect anticipated funding resources, a subset of the identified projects has been included in the “financially constrained” project list in the Regional Transportation Plan (RTP) Update. This designation is required for projects to be eligible for federal transportation funds. The financially constrained project list includes those considered “reasonably likely” to be constructed within the 25-year planning horizon based on all anticipated transportation revenue sources. As such, these projects can be included in the analysis of forecast transportation conditions as required for plan amendments.

The projects that are included in the RTP Update are indicated in Table 5-6. Many of these projects are under jurisdiction of other agencies. The local projects on the financially constrained list were selected to achieve the highest return on investment, to achieve City of Tigard goals and priorities, and to address significant congestion and/or safety issues.

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
4	OR 217/72nd Ave Interchange Improvements	Interchange Improvement	Complete interchange reconstruction with additional ramps and overcrossings	Tigard Triangle	ODOT	Near-term	Yes	\$19,500,000
5	I-5/Highway 217 interchange from 72nd Ave to Bangy Road	Interchange Improvement	Interchange Improvements		ODOT	Long-term	No	\$81,500,000
6	Upper Boones Ferry-I-5 northbound	Interchange Improvement	Widen bridge to 6 lanes to provide second westbound through lane, second northbound left-turn lane, eastbound separate through and left-turn lanes		ODOT	Long-term	No	\$20,000,000
7	Durham Road/Upper Boones/72nd realignment and widening	Road Widening and/or Reconfiguration	Realign/reconfigure/widen Durham Road, Upper Boones Ferry Road-72nd Avenue intersections/roadway to accommodate traffic flow between Durham Road and I-5. Widen Upper Boones. A refinement study is needed to address specific alignment of Durham and Upper Boones Ferry and alignment of southern Durham Road and 72nd Avenue. As part of this project Upper Boones Ferry Road from Durham to Sequoia Parkway should be widened to five lanes		Tigard	Long-term	Yes	\$6,000,000
8	Upper Boones Ferry Road Widening between upper 72nd Ave and lower 72nd	Road Widening	Widen Upper Boones Ferry from lower 72nd Avenue to upper 72nd Avenue.		Tigard	Near-term	Yes	\$2,000,000
9	Upper Boones Ferry/I-5 southbound	Intersection Improvement	Eastbound right turn lane		ODOT/Tigard	Near-term	Yes	\$2,000,000
10	72nd/Upper Boones Ferry	Intersection Improvement	Intersection Improvements		Tigard	Near-term	Yes	\$2,000,000

³All road projects include bicycle and pedestrian facilities, consistent with the street design standards for the street classification.

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
11	Hall/Hunziker/Scoffins intersection realignment	Intersection Realignment	Realign offset intersection to cross intersection to alleviate congestion and safety issues		ODOT/ Tigard	Near-term	Yes	\$5,000,000
12	Tiedeman Realignment at North Dakota Street	Road Realignment	Realign Tiedeman and/or North Dakota between Tigard Street and North Dakota to form a T Intersection at North Dakota west of the railroad tracks.		Tigard	Near-term	Yes	\$5,500,000
13	Greenburg Road/North Dakota Street Intersection Geometry Improvements	Intersection	After realignment of Tiedeman (Project: #12), realign remaining legs to conventional form	WSRC	Tigard	Near-term	Yes	\$4,000,000
14	North Dakota/Pfaffl Highway 217 over crossing	New Road/ Intersection Realignment	Pfaffle North Dakota east-west connection with Highway 217 over-crossing to provide a neighborhood route (See Projects: #12 and #13).	WSRC	Tigard	Long-term	No	\$15,000,000
17	Ash Ave railroad crossing (Burnham to Commercial)	New Road	Extend Ash Avenue across the railroad tracks from Burnham to Commercial Street	Down-town	Tigard/ ODOT Rail	Near-term	Yes	\$3,000,000
18	Ash Ave extension (Maplewood to Burnham)	New Road	Extend Ash Avenue from Maplewood, across Fanno Creek, to Burnham.	Down-town	Tigard	Mid-term	Yes	\$5,000,000
19	Atlanta Street extension	New Road	Extend Atlanta Street west to Dartmouth Street	Tigard Triangle	Tigard	Mid-term	Yes	\$3,300,000
21	Hall Boulevard extension	New Road	Extend south to Tualatin across the Tualatin River		ODOT/ Tigard	Long-term	No	\$60,000,000
22	Hwy 217 over-crossing at Washington Square Regional Center-Cascade Plaza	New Road	Provide a new connection from Nimbus to Locust	WSRC	Tigard	Long-term	Yes	\$20,000,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
23	Highway 217 over-crossing: Hunziker/Hampton connection	New Road	Connect Hunziker Road to 72nd Avenue—requires over-crossing over Highway 217—removes existing 72nd Avenue/Hunziker Street intersection		ODOT/Tigard	Mid-term	Yes	\$10,000,000
24	Oak/Lincoln/Locust Street collector system (Washington Square Connectivity Improvements)	New Road	Improvements to distribute east/west traffic between Locust and Oak Streets and improve accessibility to Lincoln Center commercial district. Includes Lincoln Street extension to Oak Street. (Lincoln Street portion anticipated to be constructed by development)	WSRC	Tigard	Mid-term	Yes	\$1,000,000
25	Taylor's Ferry Road extension	New Road	Extend to Oleson Road	WSRC	Washington County	Mid-term	Yes	\$4,390,000
27	Walnut to Ash Avenue extension	New Road	Extend Walnut east of Pacific Highway to meet Ash Avenue	Down-town	Tigard	Mid-term	Yes	\$14,000,000
29	68th Avenue	Road Widening	Widen to 2/3 lanes between Dartmouth Street/1-5 Ramps and south end	Tigard Triangle	Tigard	Mid-term	No	\$10,000,000
31	72nd Avenue widening: ORE 99W to Dartmouth	Road Widening	Widen to 4/5 lanes	Tigard Triangle	Tigard	Mid-term	Yes	\$8,000,000
32	72nd Avenue widening: Dartmouth to Hunziker	Road Widening	Widen to 4/5 lanes, including bridge	Tigard Triangle	Tigard	Mid-term	Yes	\$7,000,000
33	72nd Avenue widening: Hunziker to Durham	Road Widening	Widen to 2/3 lanes		Tigard	Long-term	No	\$14,000,000
35	Beef Bend Road complete street	Complete Street	Complete 2/3-lane section from 131st to 150th.		Washington County	Mid-term	No	\$2,280,000
36a	Bonita Road widening	Road Widening	Widen to 4/5-lanes from Hall to 72nd		Tigard	Near-term	No	\$20,000,000
36b	Bonita Road widening	Road Widening	Widen to 4/5-lanes from 72nd Avenue to city limits east of I-5 (Bangy)		Tigard	Mid-term	No	\$25,000,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
37	Dartmouth Street widening	Road Widening	Complete 4/5-lane section from Costco to 72nd Avenue (small section missing in eastbound direction only)	Tigard Triangle	Tigard	Near-term	No	\$320,000
38	Dartmouth Street widening	Road Widening	Widen to 4 lanes plus turn lanes and sidewalks between 72nd Avenue and I-5 (68th Avenue)	Tigard Triangle	Tigard	Near-term	Yes	\$3,000,000
39	Durham Road widening	Road Widening	Widen to 4/5-lanes from Pacific Hwy to Hall Boulevard		Tigard	Mid-term	Yes	\$15,000,000
40	Durham Road widening	Road Widening	Widen to 4/5 lanes (total, both directions) between Hall Boulevard and Upper Boones Ferry Road. Add second southbound left-turn lane at the intersection of Hall/Durham.		Tigard	Mid-term	Yes	\$8,000,000
41	Greenburg Road widening	Road Widening	Widen to 4 lanes adjacent to cemetery	WSRC	Washington County	Mid-term	No	\$3,780,000
43	Greenburg Road widening, south of Highway 217 to N. Dakota	Road Widening	Shady Lane to North Dakota Street, widen to 4/5 lanes. Includes bridge replacement.	WSRC	Tigard	Mid-term	Yes	\$6,000,000
44	Greenburg Road widening N. Dakota to Pacific Highway	Road Widening	Tiedeman to OR 99W, widen to 4/5 lanes with bikeways and sidewalks		Tigard	Mid-term	Yes	\$6,000,000
45a	Hall Boulevard widening, Oleson to 99W	Road Widening	Widen to 2/3 lanes; build sidewalks and bike lanes; safety improvements	WSRC	ODOT/Tigard	Near-term	Yes	\$3,500,000
45b	Hall Boulevard widening, Pacific Highway to Fanno Creek	Road Widening	Widen to up to 4/5 lanes, depending on corridor plan	Down-town	ODOT/Tigard	Near-term	Yes	\$2,500,000
45c	Hall Boulevard widening, Fanno Creek to McDonald Street	Road Widening	Widen to up to 4/5 lanes, depending on corridor plan		ODOT/Tigard	Mid-term	Yes	\$2,500,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
45d	Hall Boulevard widening, McDonald Street to Bonita Road	Road Widening	Widen to up to 4/5 lanes, depending on corridor plan		ODOT/Tigard	Near-term	Yes	\$1,500,000
45e	Hall Boulevard widening, Bonita Road to Durham	Road Widening	Widen to up to 4/5 lanes, depending on corridor plan		ODOT/Tigard	Near-term	Yes	\$3,000,000
45f	Hall Boulevard Fanno Creek Bridge replacement	Bridge Replacement	Replace the existing bridge over Fanno Creek		ODOT/Tigard	Near-term	Yes	\$5,000,000
46	McDonald Street widening, Pacific Highway to Hall Boulevard	Road Widening	Widen to 2/3 lanes with sidewalks, bike lanes and safety improvements		Tigard	Near-term	Yes	\$8,000,000
47a	Scholls Ferry Road widening, Highway 217 to 121st Avenue	Road Widening	Widen to 7 lanes between Highway 217 and 121st Avenue; improve intersections		ODOT/Washington County	Long-term	Yes	\$19,700,000
47b	Scholls Ferry Rd ROW preservation, 121st to SW Barrows	Road Widening	ROW preservation for potential seven lanes between 121st Avenue and Barrows Road, improve intersections		Washington County	Long-term	No	\$8,000,000
49	Pfaffle Street/Hall Boulevard	Intersection Improvement	Traffic signal or other intersection treatment		ODOT/Tigard	Near-term	Yes	\$500,000
50	68th/Atlanta/Haines	Intersection Improvement	Traffic signal and turn lanes where necessary	Tigard Triangle	Tigard	Near-term	Yes	\$500,000
51	68th Avenue/Dartmouth Street	Intersection Improvement	Install traffic signal and add turn lanes where necessary	Tigard Triangle	ODOT/Tigard	Near-term	No	\$500,000
52	72nd Avenue/Dartmouth Street	Intersection Improvement	Traffic signal and intersection widening	Tigard Triangle	Tigard	Near-term	Yes	\$1,100,000
53	121st Avenue/North Dakota Street	Intersection Improvement	Traffic signal		Tigard	Mid-term	No	\$500,000
54	135th Avenue/Walnut Street	Intersection Improvement	Intersection Improvements		Tigard	Near-term	Yes	\$400,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
56	Greenburg/Oleson/Hall	Intersection Improvement	Intersection Improvements	WSRC	ODOT/ WACO	Near-term	Yes	\$3,000,000
58	Greenburg/Washington Square Road	Intersection Improvement	Install Boulevard treatment at Greenburg/Washington Square Road	WSRC	ODOT/ WACO	Near-term	Yes	\$1,000,000
60	Hall/McDonald	Intersection Improvement	Add southbound right-turn lane from Hall Blvd to McDonald Street.		ODOT/ Tigard	Near-term	Yes	\$400,000
62	Main Street/Tigard Street	Intersection Improvement	Install a traffic signal at Main Street/Tigard Street. Project need should be reevaluated after Pacifi Highway/Greenburg Road/Hall Boulevard improvements and Main Street improvements are completed	Down-town	Tigard	Near-term	No	\$350,000
64	North Dakota/ 125th/ Scholls Ferry Rd	Intersection Improvement	Intersection improvements		WACO/ Tigard	Mid-term	No	\$1,500,000
65	Tiedeman Street/Tigard Street	Intersection Improvement	Intersection Improvements with sidewalks and bike lanes		Tigard	Near-term	No	\$750,000
66	Pacifi Highway Intersection Improvements	Intersection Improvement	Provide increased capacity at priority intersections, including bus queue bypass lanes in some locations, improved sidewalks, priority pedestrian crossings, and an access management plan, while retaining existing 4/5-lane facility (plus auxiliary lanes) from I-5 to Durham Road		ODOT	Near-term	Yes	See 66a - 66o

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
66a	Pacifi Highway	Signal Improvements	Provide signal interconnect from I-5 to Durham Road (Metro TSMO plan includes Arterial Corridor Management and transit signal priority for the entire corridor through Tigard with adaptive signal control from Highway 217 to the eastern city limits)		ODOT/ Tigard	Near-term	Yes	\$2,500,000
66b	Highway 217 SB Ramps/ Pacifi Highway	Intersection Improvement	Intersection capacity improvements such as a second right turn lane from off ramp		ODOT	Near-term	Yes	\$7,000,000
66c	Highway 217 NB Ramps/ Pacifi Highway	Intersection Improvement	Intersection capacity improvements such as a second northbound left turn lane		ODOT	Near-term	Yes	\$7,000,000
66d	Pacifi Highway/I-5 SB	Intersection Improvement	Intersection improvements such as dual northbound through lanes on Pacific Highway and dual lanes for I-5 ramps to reduce confusion, congestion and related accidents	Tigard Triangle	ODOT	Near-term	Yes	\$5,000,000
66e	Pacifi Highway/68th Avenue	Intersection Improvement	Intersection improvements such as added turn lanes, protected left-turns at 68th	Tigard Triangle	ODOT/ Tigard	Near-term	Yes	\$1,000,000
66f	Pacifi Highway/72nd Avenue	Intersection Improvement	Intersection improvements such as added turn lanes, a southbound right turn pocket	Tigard Triangle	ODOT/ Tigard	Near-term	Yes	\$2,000,000
66g	Pacifi Highway/ Dartmouth Street	Intersection Improvement	Intersection improvements such as turn lanes and auxiliary lanes	Tigard Triangle	ODOT/ Tigard	Near-term	Yes	\$6,000,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
66h	Pacifi Highway/Hall Boulevard	Intersection Improvement	Intersection improvements such as an additional eastbound and westbound through lane on Pacific Highway (CIP 95005), exclusive left-, through-, and right-turn lanes on each side street approach (CIP 95031)	Down-town	ODOT/Tigard	Near-term	Yes	\$6,500,000
66i	Pacifi Highway/Greenburg Road/Main Street	Intersection Improvement	Intersection improvements such as exclusive turn lanes on both Greenburg Road and Main street approaches, additional eastbound and westbound through lane on Pacific Highway	Down-town	ODOT/Tigard	Near-term	Yes	\$4,000,000
66j	Pacifi Highway/Walnut Street	Intersection Improvement	Intersection improvements such as additional turn lanes		ODOT/Tigard	Near-term	Yes	\$1,500,000
66k	Pacifi Highway/Gaarde Street/McDonald Street	Intersection Improvement	Intersection improvements such as a third through lane on Pacific Highway and additional turn lanes.		ODOT/Tigard	Near-term	Yes	\$8,000,000
66l	Pacifi Highway/Canterbury	Intersection Improvement	Intersection improvements such as a left turn lane		ODOT/Tigard	Near-term	Yes	\$2,000,000
66m	Pacifi Highway/Beef Bend Road	Intersection Improvement	Intersection improvements such as a southbound right turn lane (on Pacific Highway)		ODOT/Washington County	Near-term	Yes	\$1,500,000
66n	Pacifi Highway/Durham Road	Intersection Improvement	Intersection improvements such as a additional turn lanes		ODOT/Tigard	Near-term	Yes	\$1,500,000
66o	Pacifi Highway Access Management	Access Management	Implement access management strategies and median projects identified in the Highway Plan (related to roadway project #66)		ODOT	Near-term	Yes	\$6,000,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
82	Highway 217 NB On-ramp/Scholls Ferry Road/Washington Square Road Interchange Improvement	Intersection Improvement	Intersection Improvements	WSRC	ODOT	Near-term	No	\$5,000,000
85	Hall Boulevard, Washington Square Regional Center	Road Widening	Add an eastbound through lane on Hall Boulevard from Pamelad Road to Greenburg Road that removes the right-turn lane drop at Pamelad Road and ends as a right-turn lane at Greenburg Road. This completes the fi e-lane section on Hall Boulevard from Scholls Ferry Road to Greenburg Road	WSRC	ODOT/Tigard	Near-term	No	\$500,000
93	Highway 217/Greenburg Intersection	Intersection Improvement	Add a right-turn lane from Greenburg to SB Highway 217	WSRC	ODOT	Mid-term	Yes	\$5,000,000
95	North Dakota Street at Fanno Creek Bridge Replacement	Bridge Replacement	Replace existing bridge over Fanno Creek along North Dakota Street to include sidewalks		Tigard	Near-term	Yes	\$2,500,000
Complete Streets (Upgrade with Pedestrian/Bicycle Facilities)								
34	121st Avenue complete street, Walnut to Gaarde Street	Complete Street	Upgrade 121st Avenue to a 2-lane roadway with sidewalks and bicycle lanes between Walnut and Gaarde Street		Tigard	Near-term	Yes	\$1,580,000
48a	Walnut Street complete street, 116th Avenue to Tiedeman Street	Complete Street	Widen to 2 with turn lanes where necessary including sidewalks, bicycle lanes, and safety improvements		Tigard	Near-term	Yes	\$2,000,000
48b	Walnut Street complete street, Tiedeman to Pacifi Highway	Complete Street	Widen to 2 with turn lanes where necessary including sidewalks, bicycle lanes, and safety improvements		Tigard	Near-term	Yes	\$5,000,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
84	121st Avenue Complete street, Walnut to North Dakota Street	Complete Street	Upgrade from Walnut Street to North Dakota Street – 2 lanes with turn lanes where necessary plus bike lanes and sidewalks		Tigard	Near-term	Yes	\$380,000
86a	Main Street Green Street (Phase I)	Complete Street	Provide 2 travel lanes, turn lanes where necessary, on-street parking, good sidewalks, and lots of pedestrian-friendly amenities on Main Street from the railroad tracks south to Pacific Highway	Down-town	Tigard	Near-term	Yes	\$3,500,000
86b	Main Street Green Street (Phase II)	Complete Street	Provide 2 travel lanes, turn lanes where necessary, on-street parking, good sidewalks, and lots of pedestrian-friendly amenities on Main Street from the railroad tracks north to Pacific Highway	Down-town	Tigard	Near-term	Yes	\$2,000,000
88	80th Avenue	Complete Street	Install bike lanes and construct sidewalks on both sides of the street from Taylor's Ferry Road to Oak Street		Washington County	Mid-term	No	\$1,350,000
89	Taylor's Ferry Road	Complete Street	Install sidewalks on both sides of the street from Washington Drive to 62nd Avenue		Washington County	Long-term	No	\$3,220,000
90	Oak Street	Complete Street	Install sidewalks on both sides of the street from Hall Boulevard to 81st Avenue		Washington County	Mid-term	No	\$1,710,000
91	92nd Avenue	Complete Street	Install bike lanes and sidewalk on both sides of street from Durham Road to Cook Park		Tigard	Mid-term	Yes	\$800,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
94	Upper Boones Ferry Road south of Durham	Complete Street	Upgrade with turn lane, pedestrian, bicycle facilities and consistent with City of Durham planned improvements		Washington County/Tigard	Mid-term	No	\$2,000,000
Bicycle Projects								
B1	Tigard Transit Center bicycle hub	Bicycle Facilities	Provide bicycle hub at Tigard Transit Center	Down-town	Tigard/TriMet	Near-term	Yes	\$50,000
B2	Bonita Road	Bike Lane	Install eastbound bike lanes from 72nd Avenue to I-5 Bridge		Tigard	Near-term	Yes	\$200,000
B5	98th Avenue	Bike Lane	Install bike lanes on both sides of street from Murdock to Durham Road		Tigard	Near-term	Yes	\$150,000
B11	Omara Street	Bike Boulevard	Install bike boulevard treatments on both sides of Omara from McDonald Street to Hall Boulevard		Tigard	Long-term	Yes	\$60,000
B12	Frewing Street	Bike Boulevard	Install bike boulevard treatments on both sides of the street from Pacific Highway to Omara Street		Tigard	Long-term	Yes	\$130,000
B13	Greenburg Road	Bike Lane	Install bike lanes on both sides of the street from Hall Boulevard to Cascade Avenue	WSRC	WACO/ODOT	Near-term	Yes	\$3,600,000
B15	72nd Avenue	Bike Lane	Install bike facilities on both sides of the street from Pacific Highway to south City Limits		Tigard	Near-term	Yes	\$2,000,000
B16	Upper Boones Ferry Road	Bike Lane	Install bike lanes on both sides of street from I-5 to Durham Road		Tigard	Mid-term	Yes	\$1,000,000
B18	Bull Mountain Road Bike Lanes	Bike Lane	Install bike lanes on both sides of street		WACO	Mid-term	Yes	\$800,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
B23	79th Avenue	Bike Boulevard	Install bike boulevard treatments from Bonita Road to Durham Road		Tigard	Mid-term	Yes	\$130,000
B24	Fanno Creek Drive	Bike Boulevard	Install bike boulevard treatments on both sides of the street from the Fanno Creek Trailhead to Bonita Road		Tigard	Mid-term	Yes	\$100,000
B25	Murdock Street	Shared-lane	Install shared-lane markings from 96th Avenue to Pacific Highway		Tigard	Near-term	Yes	\$10,000
B30	Locust Street	Bike Lane	Install bike lanes on both sides of the street from Hall Boulevard to 80th Avenue	WSRC	WACO	Mid-term	Yes	\$450,000
B32	Pacific Highway Bike Lanes	Bike Lane Gaps	Fill in gaps in bike lanes along Pacific Highway		Tigard/ODOT	Near-term	Yes	\$500,000
BC3	Bonita Road at 79th	Crossing	Crossing Improvement on Bonita Road at 79th		Tigard	Near-term	Yes	\$30,000
BC4	Tiedeman at Fanno Creek Trail	Trail Realignment	Crossing improvements including trail realignment, curb cuts, pavement markings, and signage		Tigard	Mid-term	Yes	\$200,000
BC5	Tiedeman at Fanno Creek Trail	Crossing	Crossing improvements including curb cuts, pavement markings and signage		Tigard	Near-term	Yes	\$20,000
Mixed-use Path Projects								
M1	Hunziker Link to Lake Oswego	10-foot wide paved pathway	Linkage to Kruse Way Trail in Lake Oswego		Tigard/Lake Oswego	Mid-term	No	\$2,000,000
M2	Fanno Creek Trail	10-foot wide paved pathway	Complete gaps along the Fanno Creek multiuse path from the Tualatin River to Tigard Library and from Pacific Highway to Tigard Street		Tigard	Mid-term	Yes	\$3,000,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
M3	Tualatin River Trail	10-foot wide paved pathway	Complete multiuse path from Cook Park to the Powerlines Corridor		Tigard	Mid-term	No	\$1,250,000
M4	108th Avenue street crossing of Tualatin River	Pedestrian Bridge	New bridge crossing north-south over the Tualatin River near 108th Avenue		Tigard/ Tualatin	Mid-term	No	\$740,000
M5	Westside Trail	10-foot wide paved pathway	New regional multiuse path and in Tigard will connect from Beaverton to the Tualatin River Trail		Tigard	Mid-term	Yes	\$1,920,000
M6	Tigard Street Trail	10-foot wide paved pathway	Convert a segment of inactive railroad right-of-way adjacent to Tigard Street from Tiedeman Avenue to Main Street to a multiuse path	Down-town	Tigard	Near-term	Yes	\$1,250,000
M7	Washington Square Regional Center Highway 217 Pedestrian/Bike over crossing	10-foot wide paved pathway	New pedestrian and bicycle bridge over Hwy 217 from Nimbus Avenue to Scholls Ferry Road	WSRC	Tigard/ WACO	Long-term	No	\$3,700,000
M8	Neighborhood Trail Connections – Various locations	Neighborhood trails	Formalize neighborhood trail connections throughout the city		Tigard	Near-term	Yes	\$1,100,000
M9	Washington Square Regional Center Trail	10-foot wide paved pathway	Complete system gap in Washington Square Loop Trail, from Hall Boulevard to Highway 217	WSRC	Tigard	Near-Term	Yes	\$1,800,000
Pedestrian Projects								
P1	North Dakota Street sidewalks	Sidewalk Gaps	Complete gaps in sidewalks on North Dakota from 121st Avenue to Tiedeman		Tigard	Near-term	Yes	\$810,000
P3	Tiedeman Avenue sidewalks	Sidewalk Gaps	Install sidewalks on both sides of the street from Fanno Creek Trail to North Dakota Street -Greenburg Road		Tigard	Near-term	Yes	\$1,400,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
P5	Pacific Highway sidewalks	Sidewalk Gaps	Complete gaps in sidewalk from McDonald to south city limits		ODOT	Near-term	No	\$1,300,000
P6	Bull Mountain Road sidewalks	Sidewalk Gaps	Complete gaps in sidewalk from Pacific Highway to Roshak Road		WACO	Mid-term	No	\$2,580,000
P7	Roshak Road sidewalks	Sidewalk Gaps	Complete gaps in sidewalk, mainly between 158th Terrace and Bull Mountain Road		WACO	Mid-term	No	\$640,000
P9	Hunziker Street Sidewalks	Sidewalk Gaps	Install sidewalk on both sides of the street from 72nd Avenue to Hall Boulevard		Tigard	Mid-term	No	\$700,000
P10	Washington Square Regional Center pedestrian improvements	Pedestrian Improvements	Improve sidewalks, lighting, crossings, bus shelters and benches in WSRC	WSRC	Tigard	Mid-term	Yes	\$3,900,000
P16	Tigard Street	Sidewalk	Install sidewalks on both sides of the street from 115th Avenue to Pacific Highway		Tigard	Near-term	Yes	\$1,200,000
P18	Commercial Street	Sidewalk	Install sidewalks on both sides of the street from Main Street to Lincoln Street	Down-town	Tigard	Near-term	Yes	\$400,000
P19	72nd Avenue	Sidewalk	Complete gaps in sidewalk from Pacific Highway to Bonita Road		Tigard	Near-term	No	\$2,500,000
P20	Hall Boulevard	Sidewalk	Complete gaps in sidewalk from Hunziker Street to Durham Road		ODOT/ Tigard	Near-term	Yes	\$1,800,000
P23	72nd Avenue	Sidewalk	Install sidewalk on both sides of street from Upper Boones Ferry Road to Durham Road		Tigard	Near-term	No	\$800,000
P24	Benchview Terrace	Sidewalk Gaps	Install sidewalk on both sides of street for missing sections west of Greenfield Drive		Tigard	Mid-term	No	\$1,200,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
P25	79th Avenue	Sidewalk Gaps	Install sidewalk on both sides of street from Bonita Road to Durham Road		Tigard	Mid-term	No	\$800,000
P27	Murdock Street	Sidewalk Gaps	Install sidewalk on both sides of street from 96th Avenue to Pacific Highway		Tigard	Mid-term	No	\$570,000
P29	150th Avenue	New Sidewalk	Install sidewalk on both sides of street from Bull Mountain Road to Beef Bend Road		WACO	Mid-term	No	\$900,000
P30	97th Avenue	Sidewalk Gaps	Install sidewalk on both sides of street from McDonald Street to Murdock Street		Tigard	Near-term	Yes	\$400,000
P31	Garrett Street	Sidewalk	Install sidewalks on both sides of the street from Pacific Highway to Ash Avenue		Tigard	Near-term	No	\$160,000
P33	Greenfi Id Drive	New Sidewalk	Install sidewalk on both sides of street for missing section south of Benchview Terrace		Tigard	Near-term	No	\$280,000
PC3	Crosswalk on McDonald at Omara and 98th Court	Pedestrian Signing/ Striping	Pedestrian/bike improvements at unsignalized intersection at McDonald/Omara/98th Court		Tigard	Near-term	No	\$50,000
PC7	Tigard Town Center (Downtown Tigard) pedestrian improvements	Pedestrian Facilities	Improve sidewalks, lighting, crossings, bus shelters and benches throughout the downtown including: Pacific Highway, Hall Boulevard, Main Street, Hunziker Street, Walnut Street and neighborhood streets.		Tigard	Near-term	Yes	\$4,880,000
PC9	Greenburg Road/95th Avenue Raised pedestrian refuge and marked crosswalk	Pedestrian Signing/ Striping	Construct pedestrian/bike improvements at the existing unsignalized crosswalk at Greenburg Road/95th Avenue		Tigard	Mid-term	Yes	\$50,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
Transit Projects								
T2	Transit Stop Amenity Improvements on Pacific Highway	Transit Amenities	Support existing high frequency bus service on the Pacific Highway corridor by providing benches, shelters and real-time information at bus stops		Tigard/ TriMet	Near-term	Yes	\$400,000
T3	Tigard Connector Service in the Tigard Triangle	Transit Connector	Provide local connector service serving Tigard Triangle to Downtown Tigard, and/or the Washington Square Mall and potential residential areas.	Tigard Triangle	Tigard/ TriMet	Long-term	No	\$750,000
T4	HCT Planning, Phase 1	Transit	Land use planning and alternatives analysis for HCT		TriMet	Near-term	Yes	\$1,000,000
T5	HCT Planning, Phase 2	Transit	Land use planning and alternatives analysis for HCT		TriMet	Mid-term	Yes	\$4,000,000
Transportation System Management								
TSM1	Upper Boones Ferry Road	Arterial Corridor Management	Provide Arterial Corridor Management along Corridor #2 (I-5) in the Metro TSMO Plan		Tigard	Mid-term	No	\$1,300,000
TSM3	72nd Avenue	Arterial Corridor Management	Provide Arterial Corridor Management on 72nd Avenue along Corridor #2 (I-5) near the Upper Boones Ferry Road Interchange in the Metro TSMO Plan	Tigard Triangle	Tigard	Mid-term	No	\$1,600,000
TSM4	72nd Avenue	Arterial Corridor Management	Provide Arterial Corridor Management along Corridor #19 (Highway 217) in the Metro TSMO Plan	Tigard Triangle	Tigard	Mid-term	No	\$1,700,000
TSM5	Durham Road	Arterial Corridor Management	Provide Arterial Corridor Management along Corridor #2 (I-5) in the Metro TSMO Plan		Tigard	Near-term	No	\$1,400,000

TABLE 5-6: MULTI-MODAL PROJECT IMPROVEMENT LIST continued...

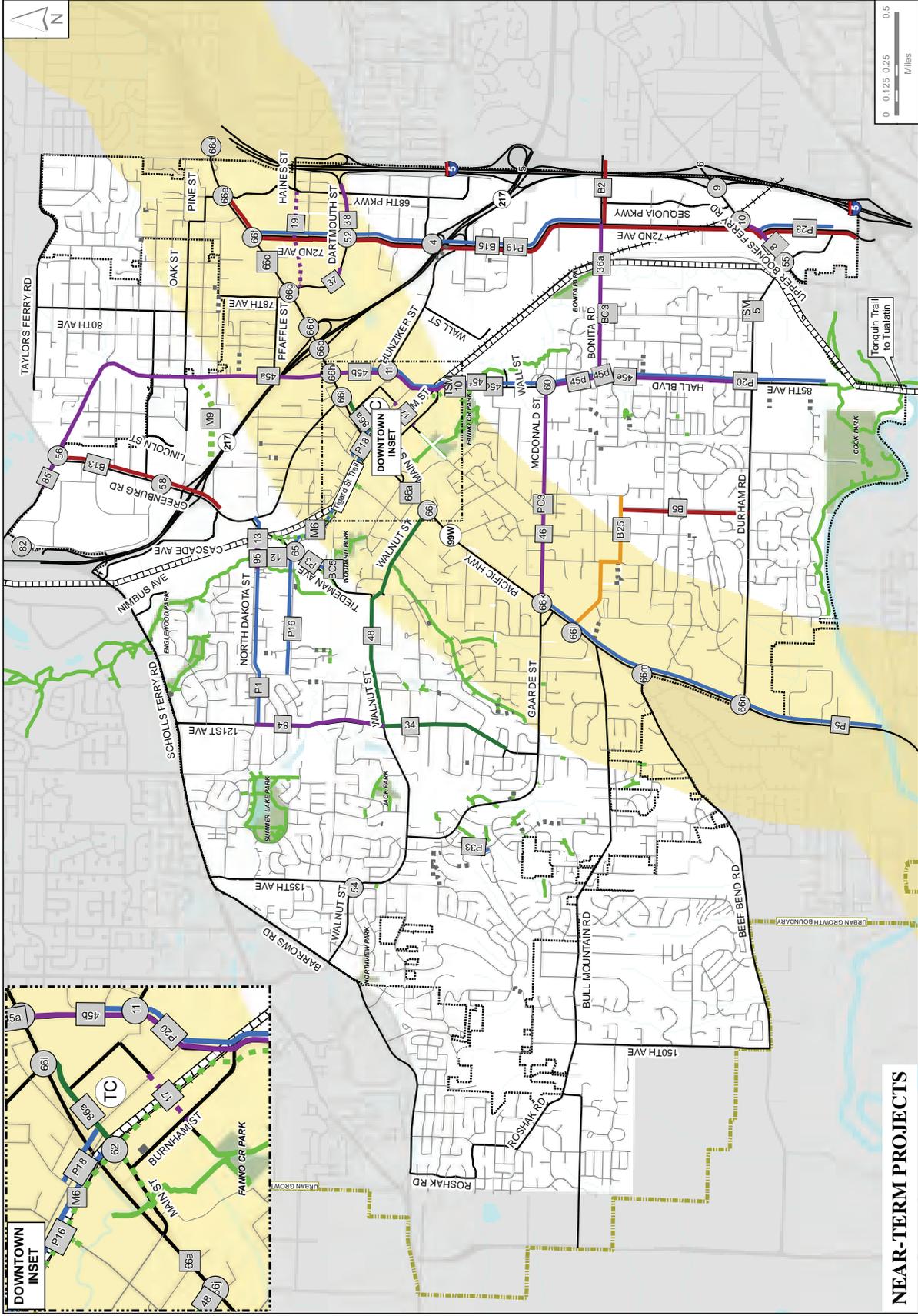
Project ID	Name	Project Type	Description ³	Special Area	Jurisdiction	Time Frame	Financially Constrained	Cost Estimate
TSM6	Durham Road	Arterial Corridor Management	Provide Arterial Corridor Management along Corridor #19 (Highway 217) in the Metro TSMO Plan		Tigard	Mid-term	No	\$1,500,000
TSM9	Hall Boulevard	Arterial Corridor Management	Provide Arterial Corridor Management and Transit Signal Priority on Hall Boulevard from Highway 217 to Pacific Highway	WSRC	ODOT/ Tigard/ Beaverton	Mid-term	No	\$3,700,000
TSM10	Hall Boulevard	Arterial Corridor Management	Provide Arterial Corridor Management from Pacific Highway to the south terminus		ODOT/ Tigard	Near-term	No	\$1,900,000
TSM11	Scholls Ferry Road	Arterial Corridor Management	Provide Arterial Corridor Management from River Road to Hall Boulevard		ODOT/ WACO/ Tigard	Mid-term	Yes	\$4,200,000

The project timelines identified in Table 5-2 are depicted in Figure 5-9, Figure 5-10 and Figure 5-11. The first figure shows only near-term projects; Figure 5-10 shows the combined Near-term and Mid-term projects. Figure 5-11 shows all of the planned projects.

Figure 5-9

Near-Term Transportation Improvements
Tigard Urban Planning Area

- Existing Facilities**
- Major Roads
 - Local Roads
 - Multi-Use Path
- Future Facilities**
- Intersection Project
 - Roadway Project
 - HCT Corridor
 - Neighborhood Path
- Road Improvements**
- Road Improvement (includes pedestrian and bike facilities)
 - Complete Streets (adds sidewalks and bike lanes)
 - Sidewalk
 - Bike Lane
 - Bike Boulevard
- New Facilities**
- New Road (includes pedestrian and bike facilities)
 - Multi-Use Path
- Other Map Elements**
- Transit Center
 - Tigard City Boundary
 - Water
 - Parks



This map is provided for illustrative purposes. The complete list of projects is provided in Table 5-6.



** The information represented on this map is current as of December 23, 2010. Revisions will be made as new decisions or amendments occur to alter the content of the map.

NEAR-TERM PROJECTS

Figure 5-10
Near/Mid-Term
Transportation
Improvements
 Tigard Urban
 Planning Area

- Existing Facilities**
- Major Roads
 - Local Roads
 - Multi-Use Path
- Future Facilities**
- Intersection Project
 - Roadway Project
 - HCT Corridor
 - Neighborhood Path

- Road Improvements**
- Road Improvement (includes pedestrian and bike facilities)
 - Complete Streets (includes sidewalks and bike lanes)
 - Stewalk
 - Bike Lane
 - Bike Boulevard

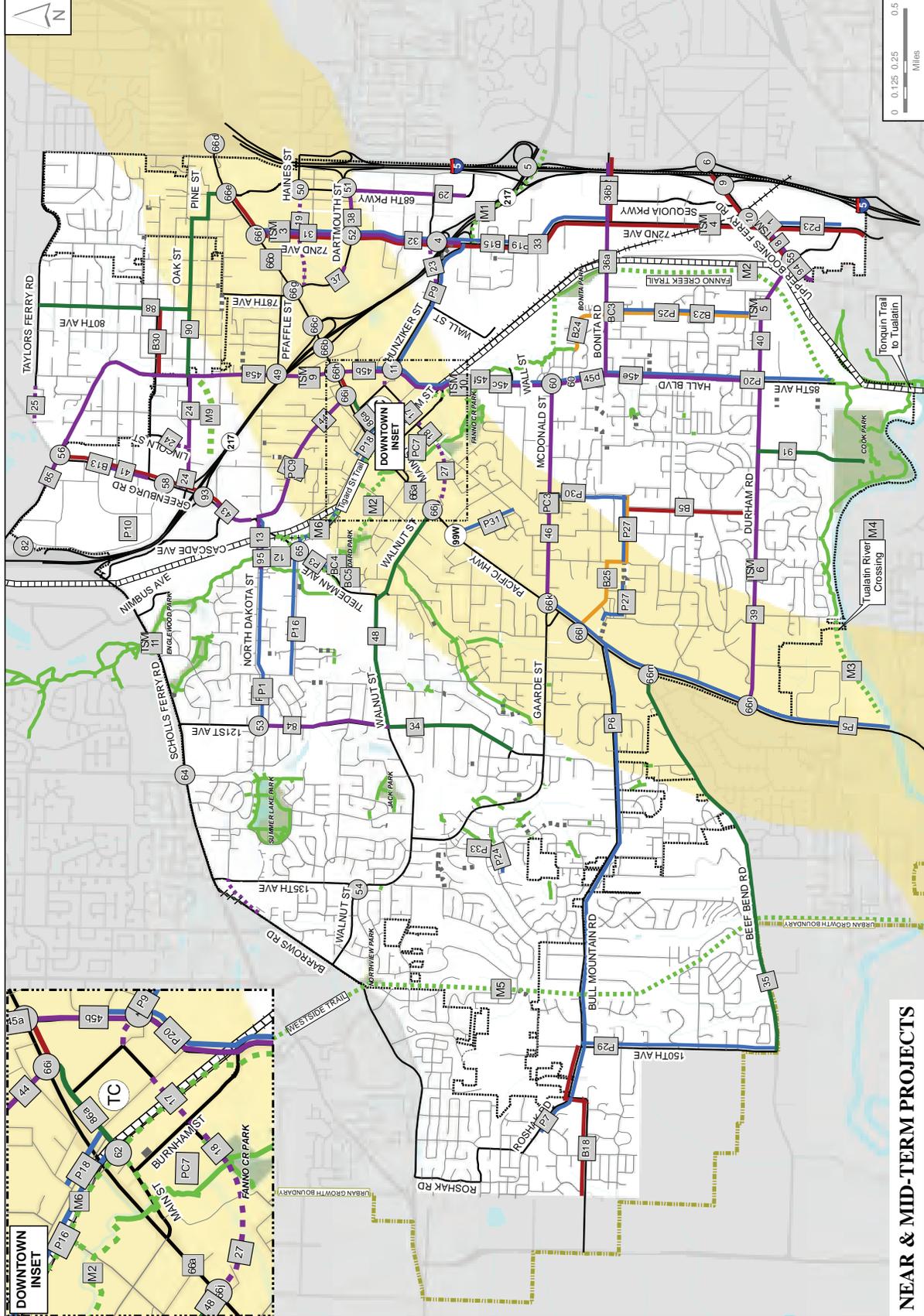
- New Facilities**
- New Road (includes pedestrian and bike facilities)
 - Multi-Use Path

- Other Map Elements**
- Transit Center
 - Tigard City Boundary

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NEAR & MID-TERM PROJECTS

Figure 5-11

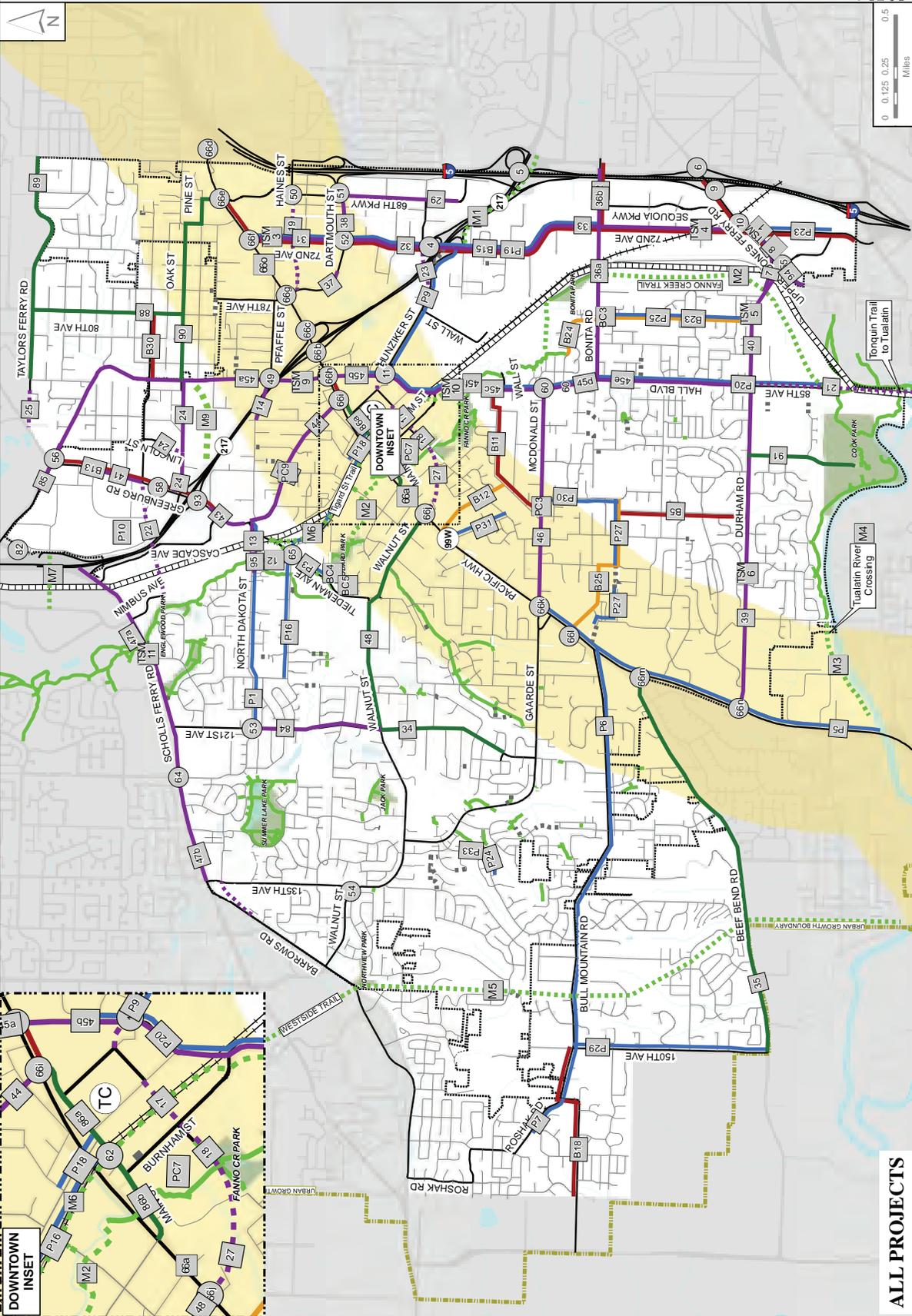
**All
Transportation
Improvements**
Tigard Urban
Planning Area

- Existing Facilities**
- Major Roads
 - Local Roads
 - Multi-Use Path
- Future Facilities**
- Intersection Project
 - Roadway Project
 - HCT Corridor
 - Neighborhood Path
- Road Improvements**
- Road Improvement (includes pedestrian and bike facilities)
 - Complete Streets (adds sidewalks and bike lanes)
 - Stidewalk
 - Bike Lane
 - Bike Boulevard
- New Facilities**
- New Road (includes pedestrian and bike facilities)
 - Multi-Use Path
- Other Map Elements**
- Transit Center
 - Tigard City Boundary
 - Water
 - Parks

This map is provided for illustrative purposes. The complete list of projects is provided in Table 5-6.



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ALL PROJECTS

Special Areas

The following section identifies the three areas within the city—Tigard Triangle, Washington Square Regional Center and Downtown Tigard—with growth opportunities but also significant transportation challenges. Each of the three areas are described below, including a summary of current transportation challenges, followed by strategies for infrastructure investments which are depicted in Figures 5-12 through 5-15.

In addition to improvement projects, this 2035 TSP identifies non-SOV mode split targets for the Tigard Triangle that are higher than required by the Metro RTP (see Table 5-3). Achieving these targets will require integrated land use and parking management strategies.

► Land Use Planning

Each of these areas is designated for significant housing and employment growth. The land in the Tigard Triangle is zoned for commercial development (west of 72nd Avenue) and mixed-use development (east of 72nd Avenue). Development of commercial and residential uses in close proximity to each other promotes walking trips for commute trips and non-commute travel. These opportunities can be captured by incorporating densities, mixed-uses, design standards and other land use strategies in the overall planning efforts for the areas.

An initial look at land use alternatives will occur with the initial phases of HCT planning. Development patterns that support HCT—such as mixed uses, higher densities, pedestrian orientation—will encourage the public investments necessary to implement HCT. As future transportation and land uses studies for HCT move forward, they will help to identify complementary land use and transportation investments to support HCT and other transit service to Tigard.

► Parking Management

Parking management will be a critical component of creating travel options to and from each sub-area. Adequate parking is essential to economic vitality; at the same time too much parking can degrade the pedestrian environment and cause excessive physical space dedicated to parking. A review of parking requirements and parking management measures is warranted in conjunction with land use planning for these areas. In particular, as more emphasis and investment is directed toward walk, bike and transit trips, the amount of parking and the way that it is used will be modified to support the priority purposes of each subarea.

Tigard Triangle

The Tigard Triangle is a priority opportunity for community development and economic activity. The triangle has long been a retail and commercial hub within the city. Today, the triangle is zoned for commercial and mixed-use development and is identified as an area of significant future growth in housing and jobs.

Although the area is bordered by three major regional roadways, in many ways those roadways function as barriers to access the triangle. Travel to and from the Tigard Triangle is funneled from Pacific Highway via 72nd Avenue, Dartmouth Street and 68th Parkway; the Highway 217/72nd Avenue interchange; the

northbound I-5 interchange with Haines Street; and the southbound I-5 interchange with Dartmouth Street.

Access to and from the Tigard Triangle area is, and will remain, a critical issue to the success of the Tigard Triangle area. The majority of employees and customers traveling to the area on city streets access the Tigard Triangle area off of Pacific Highway. There is considerable congestion on Pacific Highway in the vicinity of the Tigard Triangle and this congestion is forecast to worsen with future development and regional growth.

A second issue with the Tigard Triangle relates to non-auto mobility/circulation to/from and within the area. The triangle area as a whole is generally sloping downward from Pacific Highway and I-5 to Highway 217. The topography makes pedestrian and bicycle transportation more difficult. These conditions are worsened by incomplete bicycle and pedestrian systems within the Triangle.

At the broadest level, options for improving access to the Tigard Triangle area fall into the following categories:

- ▶ Provide additional intersection and roadway capacity improvements to improve traffic operations at the boundary streets.
- ▶ Minimize additional roadway capacity infrastructure investment and focus on travel demand management (TDM) programs.
- ▶ Provide better facilities for alternative modes (transit, bicycles, pedestrians, etc.).
- ▶ Create a mix of critical additional capacity and implementing TDM programs.

▶ **Infrastructure Investments**

Figure 5-12 shows the planned roadway improvement projects related to access to the Tigard Triangle. Within the Triangle, the improvement projects include several capacity enhancements to existing roadways, extension of Atlanta Street to connect 68th Avenue and Dartmouth, and a new Highway 217 overcrossing connecting Hunziker Street to Hampton Street. The Atlanta Street extension and Hunziker Street overcrossing would provide needed additional circulation options for auto and non-auto modes of transportation within the Tigard Triangle. In addition, the Hunziker Street overcrossing would provide an additional access to the Tigard Triangle area from the south and west.

Figure 5-12
Tigard Triangle
Planned
Improvements

Tigard Urban
 Planning Area

- Existing Facilities**
- Major Roads
 - Local Roads
 - Multi-Use Path

- Future Facilities**
- Intersection Project
 - Roadway Project
 - HCT Corridor
 - Neighborhood Path

- Road Improvements**
- Road Improvement (includes pedestrian and bike facilities)
 - Complete Streets (includes sidewalks and bike lanes)
 - Sidewalk
 - Bike Lane
 - Bike Boulevard

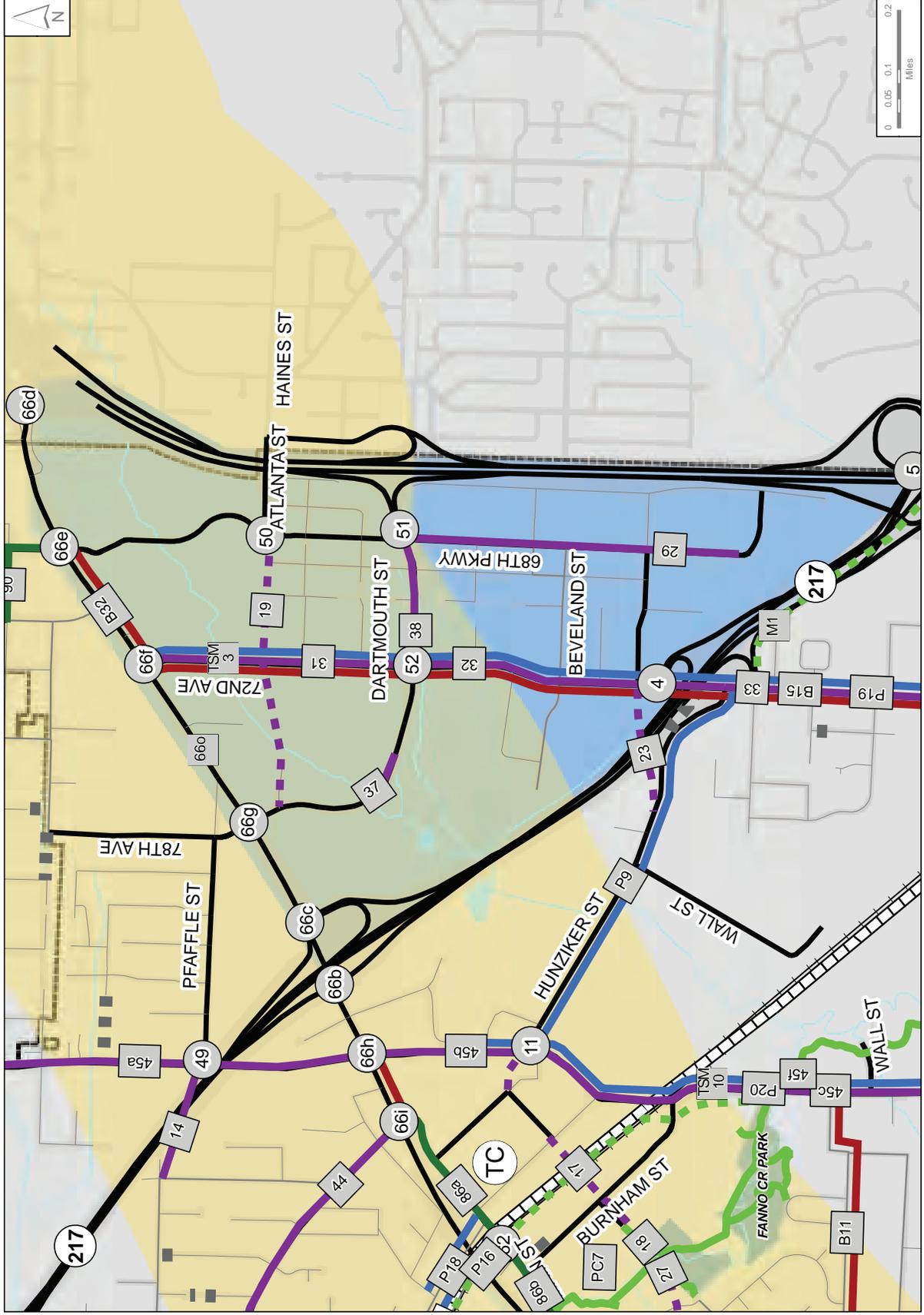
- New Facilities**
- New Road (includes pedestrian and bike facilities)
 - Multi-Use Path

- Other Map Elements**
- Transit Center
 - Tigard City Boundary
 - Water
 - Parks

This map is provided for illustrative purposes. The complete list of projects is provided in Table 5-6.



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The plan also includes widening 72nd Avenue (arterial) and Dartmouth Street (collector) to five lanes. Without careful design of both facilities, these could end up functioning as a surrogate for I-5 travel and could become significant pedestrian and bicycle barriers within the Tigard Triangle. An initial step toward realizing these projects is a corridor study (see Table 5-4) to review street cross sections and potential parallel routes. Specific project considerations for the Tigard Triangle can be found in Technical Memorandum #5 in the Volume 3 Technical Appendix.

Washington Square Regional Center

The Washington Square Regional Center (WSRC) is the only designated Regional Center in the City of Tigard. It is primarily designated for mixed-use development and is an area of the City with significant forecast job growth. Some of the highest job growth in the WSRC is on the west side of Highway 217 both in Tigard (south of Scholls Ferry Road) and Beaverton (north of Scholls Ferry Road). This is why the Washington Square Regional Center (WSRC) Plan, completed in 1999, included major infrastructure investments aimed at connecting the Washington Square Mall with the land uses on the west side of Highway 217.

The WSRC is criss-crossed by Highway 217, Scholls Ferry Road and Greenburg Road and partially bounded by Hall Boulevard and Fanno Creek. Travel in and out of the area is primarily funneled through the Highway 217/Scholls Ferry Road and Highway 217/Greenburg Road interchanges and the Scholls Ferry Road/Hall Boulevard intersection. All of these facilities are under the jurisdiction of either ODOT or Washington County and currently experience significant peak hour congestion and queuing.

The WSRC has a transit center at Washington Square served by TriMet Routes 43, 45, 56, 62, 76 and 78 connecting it to the Beaverton, Sunset, Tigard and Lake Oswego Transit Centers, as well as the City of Tualatin and downtown Portland. It also has a Westside Express Service (WES) commuter rail station located on the west side of Highway 217 near Hall Boulevard. Although all of the major facilities in the WSRC have sidewalks (with the exception of segments of Greenburg Road), the size, traffic volumes and design of all of the intersections and roadways within the WSRC do not create a very desirable environment for pedestrians to travel within the WSRC. Similarly, the absence of bicycle lanes on Greenburg Road, and around the Highway 217 ramp terminals on Scholls Ferry Road, compromise cycling access to the WSRC.

The WSRC is an important regional center in Tigard and Washington County. Multi-modal access and accommodation of growth continue to be priorities. Options for improving access to the WSRC area fall into the following categories:

- ▶ Provide better facilities for alternative modes (transit, bicycles, pedestrians, etc.)
- ▶ Focus on travel demand management (TDM) programs to optimize existing roadway infrastructure.
- ▶ Provide intersection and roadway capacity improvements to improve traffic operations at the boundary streets.

Additionally, the WSRC Master Plan is identified for a review and potential update (See Table 5-4).

► Infrastructure Investment

Figure 5-13 shows the planned improvement projects serving the WSRC vicinity. The 1999 WSRC Plan proposed two bridges and roadways to connect the WSRC across Highway 217 to reduce the magnitude of this barrier: the northern crossing extended from Washington Square Mall Road across Highway 217 connecting to Cascade Avenue; the southern crossing conceptually extending Locust Street across Highway 217 to Nimbus Avenue. The connectivity benefits of these two roadway extensions would be enhanced by extending Nimbus Avenue south roughly parallel to the WES Commuter Rail tracks to Greenburg Road. Although these facilities would provide secondary circulation to Highway 217 and improve multi-modal access to the Washington Square Area, they are not considered feasible due to their high cost and likely significant environmental impacts. As shown in Figure 5-13 the 2035 TSP modifies the northern crossing for pedestrians and bicyclists only. It is not identified as a vehicle connection due to cost and constructability constraints.

Other infrastructure improvements planned within the WSRC include the southern Highway 217 crossing connecting Nimbus Avenue to Locust Street, pedestrian improvements throughout the WSRC, bicycle lanes on Greenburg Road, street connectivity enhancements on Oak Street, Lincoln Street and Locust Street, and intersection and roadway capacity enhancements on Greenburg Road, Scholls Ferry Road and Hall Boulevard. Specific project considerations can be found in Technical Memorandum #5 in the Volume 3 Technical Appendix.

Downtown Tigard

The City of Tigard is committed to creating a downtown that is active, has a compact urban form and provides multi-modal access and circulation. Public investments and planning activities for downtown are intended to provide a catalyst for economic development. Significant growth in Downtown Tigard is planned for both employment and housing uses.

Downtown Tigard is primarily located south of Pacific Highway between Hall Boulevard and Fanno Creek but also extends north of the Pacific Highway near Greenburg Road and Hall Boulevard. Pacific Highway and Hall Boulevard are the primary access routes to the downtown area. Pacific Highway currently experiences significant peak hour congestion and queuing which also impacts travel on Hall Boulevard. The Pacific Highway viaduct over the railroad tracks creates a grade separation between Pacific Highway and Main Street and limits both access and visibility to the Downtown Tigard from the highway.

Downtown Tigard has a transit center which is served by TriMet Routes 12, 45, 64, 76 and 78 connecting it to the Beaverton Transit Center, Sherwood, Lake Oswego, Tualatin and downtown Portland. The Tigard Transit Center is also served by WES Commuter Rail. The existing transit service available to Downtown Tigard, combined with future plans to enhance WES service and provide high capacity transit along the Pacific Highway corridor, position Downtown to have transit service that can support increased employment and residential growth in the area despite existing congestion along Pacific Highway.

Although Pacific Highway and Hall Boulevard have sidewalks and bicycle lanes (with the exception of a few gaps in the sidewalk system on Hall Boulevard), the lack of local and collector street connectivity and existing roadway geometry within the Downtown Tigard area do not create a very desirable environment for pedestrians and bicyclists to travel within the downtown.

At the broadest level, options for improving access to the downtown area fall into the following categories:

- ▶ Improve local and collector roadway connectivity to and within Downtown Tigard.
- ▶ Provide better facilities for alternative modes (transit, bicycles, pedestrians, etc.).
- ▶ Enhance intersection capacity on Pacific Highway to increase the ability to cross and access Pacific Highway from Walnut Street, Greenburg Road and Hall Boulevard.

In order to address these issues the City prepared a Downtown Connectivity and Circulation Plan which identified a more complete system of streets and pathways to improve multi-modal access to, from and within the Downtown Mixed Use Central Business District. Through this effort the following transportation facility design principles were recognized as being of particular importance within the downtown:

- ▶ Maximize efficiency and ease of access for all transportation modes and for emergency services. (This principle can be realized, in part, by determining appropriate access spacing and by avoiding off-set intersections.)
- ▶ Enhance accessibility for people of all ages and abilities. (Strategies for achieving this objective include keeping block sizes relatively small and providing bike and pedestrian facilities.)
- ▶ Create a network with a diversity of human-scaled street types that support urban places and integrate with blocks/buildings.
- ▶ Link with city, regional, and national transportation networks. (Achieving this end requires careful integration of this plan with Tigard's TSP and with other local and regional planning efforts.)
- ▶ Ensure the economic viability of the blocks that result from the implementation of the new street grid.

In addition, a number of connectivity and circulation improvements, including new road and pathway connections within and adjacent to the downtown area were identified. These improvements are intended to foster creation of smaller block sizes, efficient routes into and within downtown, and new streets to accommodate and encourage downtown development as well as to solve some existing connectivity issues, such as access across railroad tracks

▶ **Infrastructure Investment**

Figure 5-14 shows the additional multi-modal improvement projects related to the Downtown Tigard area which include Main Street streetscape improvements, a mixed-use trail along the rail corridor, and Ash Street extensions east across the railroad tracks and west and north to Pacific Highway. *Specific project considerations can be found in Technical Memorandum #5 in the Volume 3 Technical Appendix.*

▶ **Connectivity Requirements**

In addition to the projects shown on Figure 5-14, the Downtown Connectivity and Circulation Plan identified a more complete system of streets and pathways to improve multi-modal access to, from and within the Downtown Mixed Use Central Business District. These improvements are shown on Figures 5-14A through 5-14I and are subject to the connectivity requirements below. If an alternate alignment is subsequently been approved by the City, the alternate alignment shall supersede the alignment shown on Maps 5-14B – Figure 5-14I.

Figure 5-14

**Downtown
Planned
Improvements**

Tigard Urban
Planning Area

Existing Facilities

- Major Roads
- Local Roads
- Multi-Use Path

Future Facilities

- Intersection Project
- Roadway Project
- HCT Corridor
- Neighborhood Path

Road Improvements

- Road Improvement (includes pedestrian and bike facilities)
- Complete Streets (adds sidewalks and bike lanes)
- Sidewalk
- Bike Lane
- Bike Boulevard

New Facilities

- New Road (includes pedestrian and bike facilities)
- Multi-Use Path

Other Map Elements

- Transit Center
- Tigard City Boundary
- Parks
- Water

This map is provided for illustrative purposes. The complete list of projects is provided in Table 5-6.



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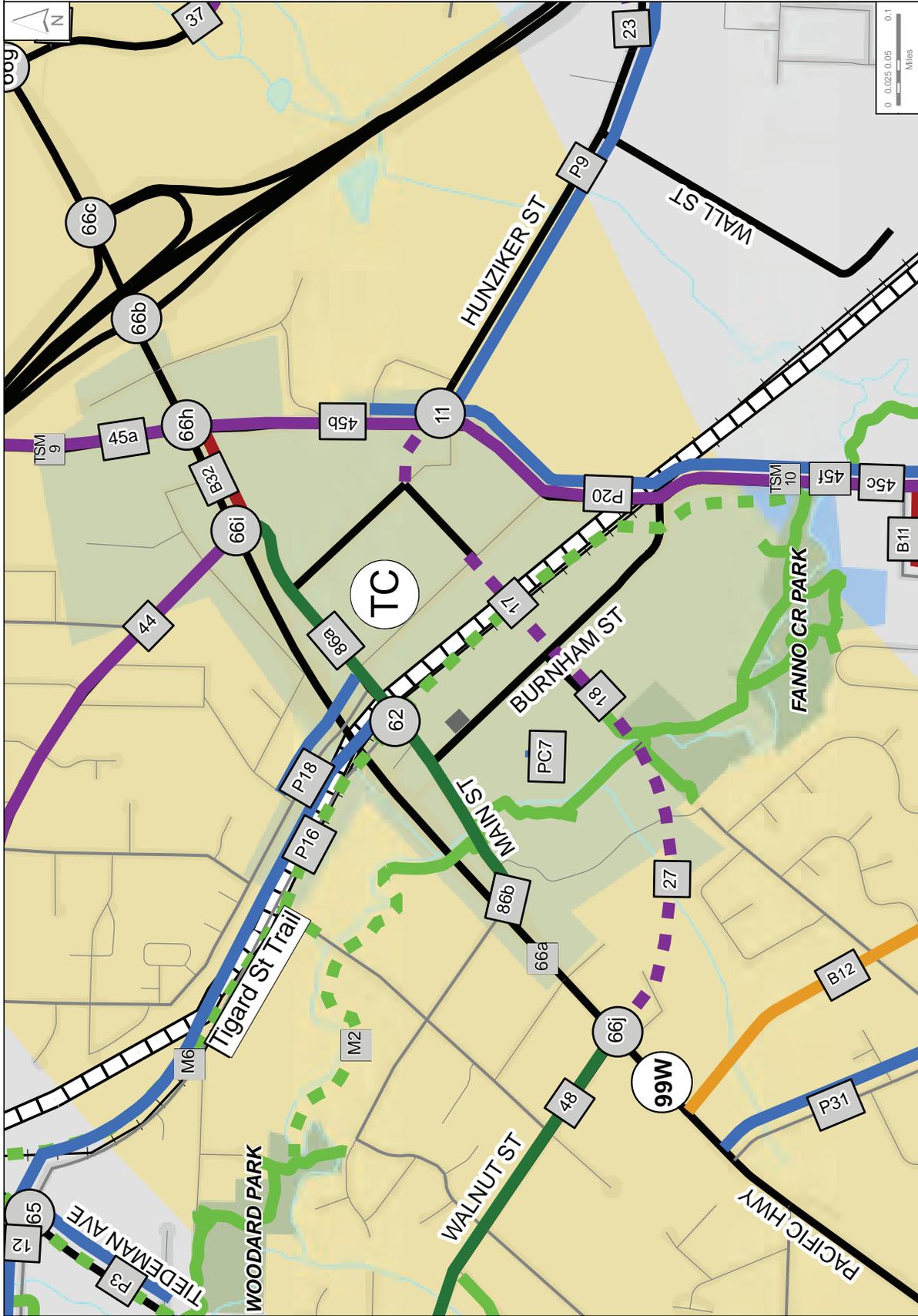


Figure 5-14A. Connectivity Projects Index Map

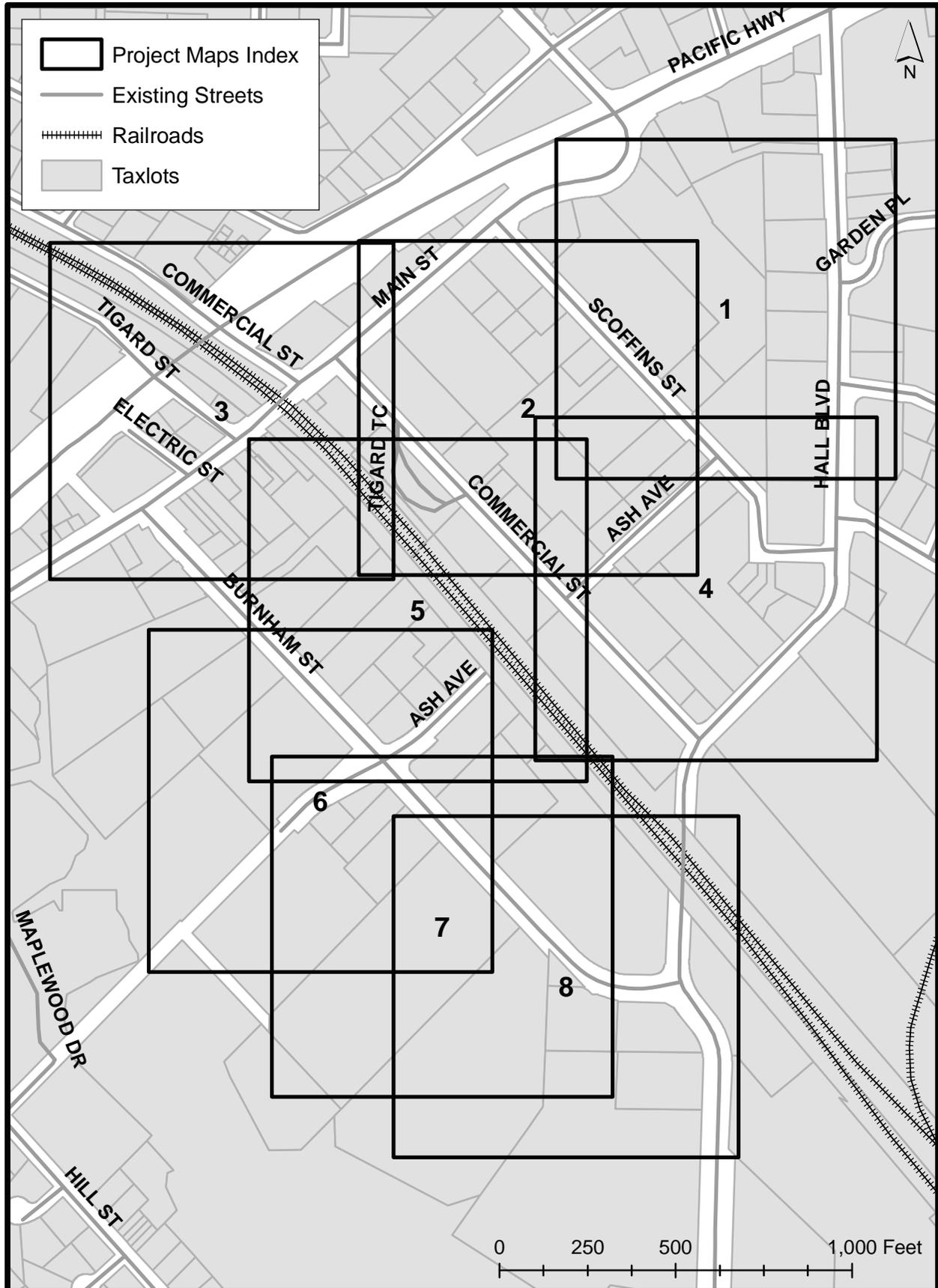


Figure 5-14B. Connectivity Projects Detail Sheet: Map 1

Character

- Downtown Mixed Use 1 (Collector)
- Downtown Mixed Use 2 (Local)
- Urban Residential (52'-56')
- - Alley (20')

- Conceptual Connection
- Future Connectivity Alignment Area
- Required bike/pedestrian connections
- Existing Streets
- Taxlots

Note: The width of the Future Connectivity Alignment Area is equal to the upper end of the right-of-way range listed for the street character type.



Figure 5-14C. Connectivity Projects Detail Sheet: Map 2

Character

- Downtown Mixed Use 1 (Collector)
- Downtown Mixed Use 2 (Local)
- Urban Residential (52'-56')
- - Alley (20')

- Conceptual Connection
- Future Connectivity Alignment Area
- Required bike/pedestrian connections
- Existing Streets
- Taxlots

Note: The width of the Future Connectivity Alignment Area is equal to the upper end of the right-of-way range listed for the street character type.



Figure 5-14D. Connectivity Projects Detail Sheet: Map 3

Character

- Downtown Mixed Use 1 (Collector)
- Downtown Mixed Use 2 (Local)
- Urban Residential (52'-56')
- - Alley (20')

- Conceptual Connection
- Future Connectivity Alignment Area
- Required bike/pedestrian connections
- Existing Streets
- Taxlots

Note: The width of the Future Connectivity Alignment Area is equal to the upper end of the right-of-way range listed for the street character type.

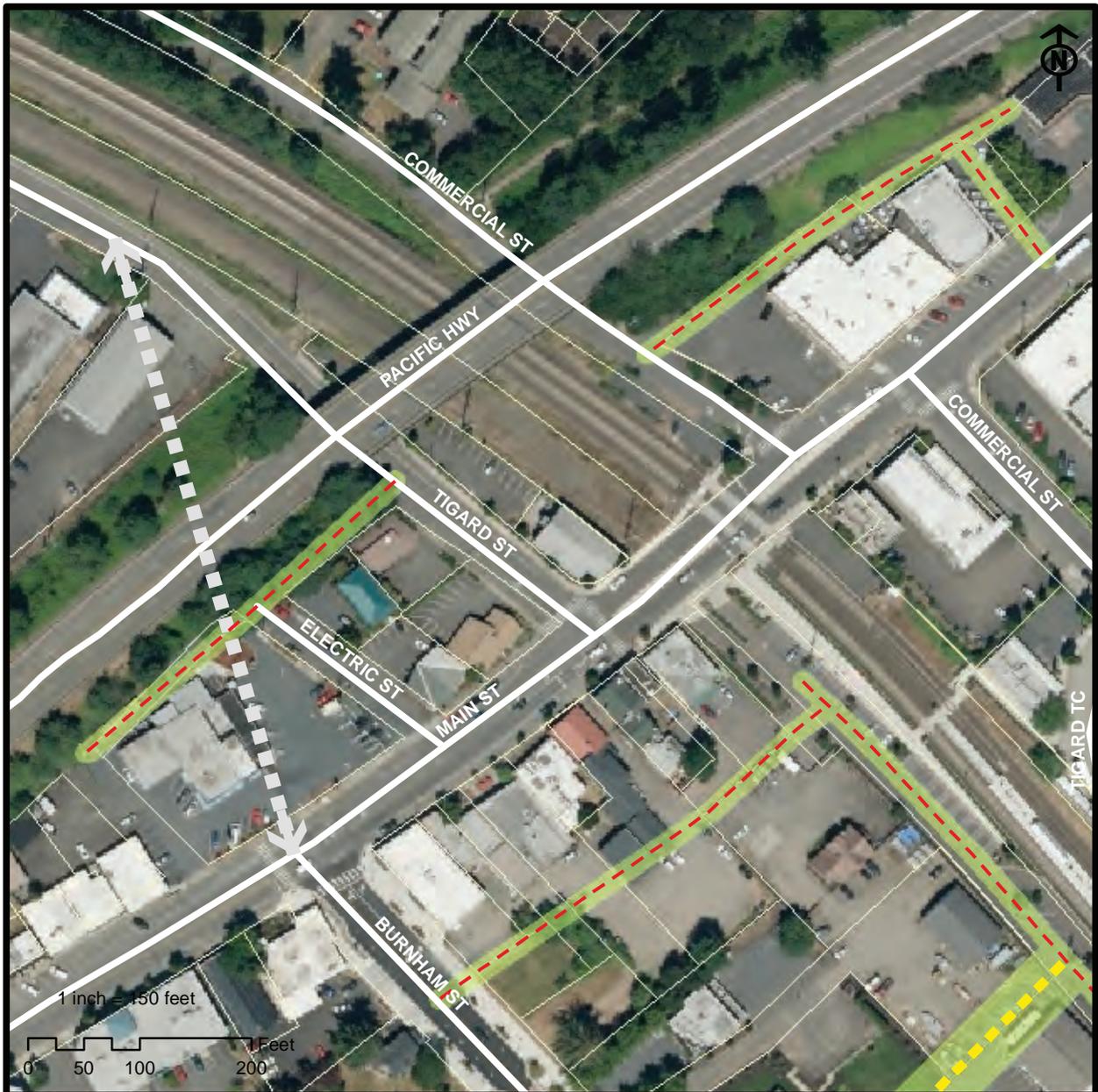


Figure 5-14E. Connectivity Projects Detail Sheet: Map 4

Character

- Downtown Mixed Use 1 (Collector)
- Downtown Mixed Use 2 (Local)
- Urban Residential (52'-56')
- - Alley (20')

- Conceptual Connection
- Future Connectivity Alignment Area
- Required bike/pedestrian connections
- Existing Streets
- Taxlots

Note: The width of the Future Connectivity Alignment Area is equal to the upper end of the right-of-way range listed for the street character type.

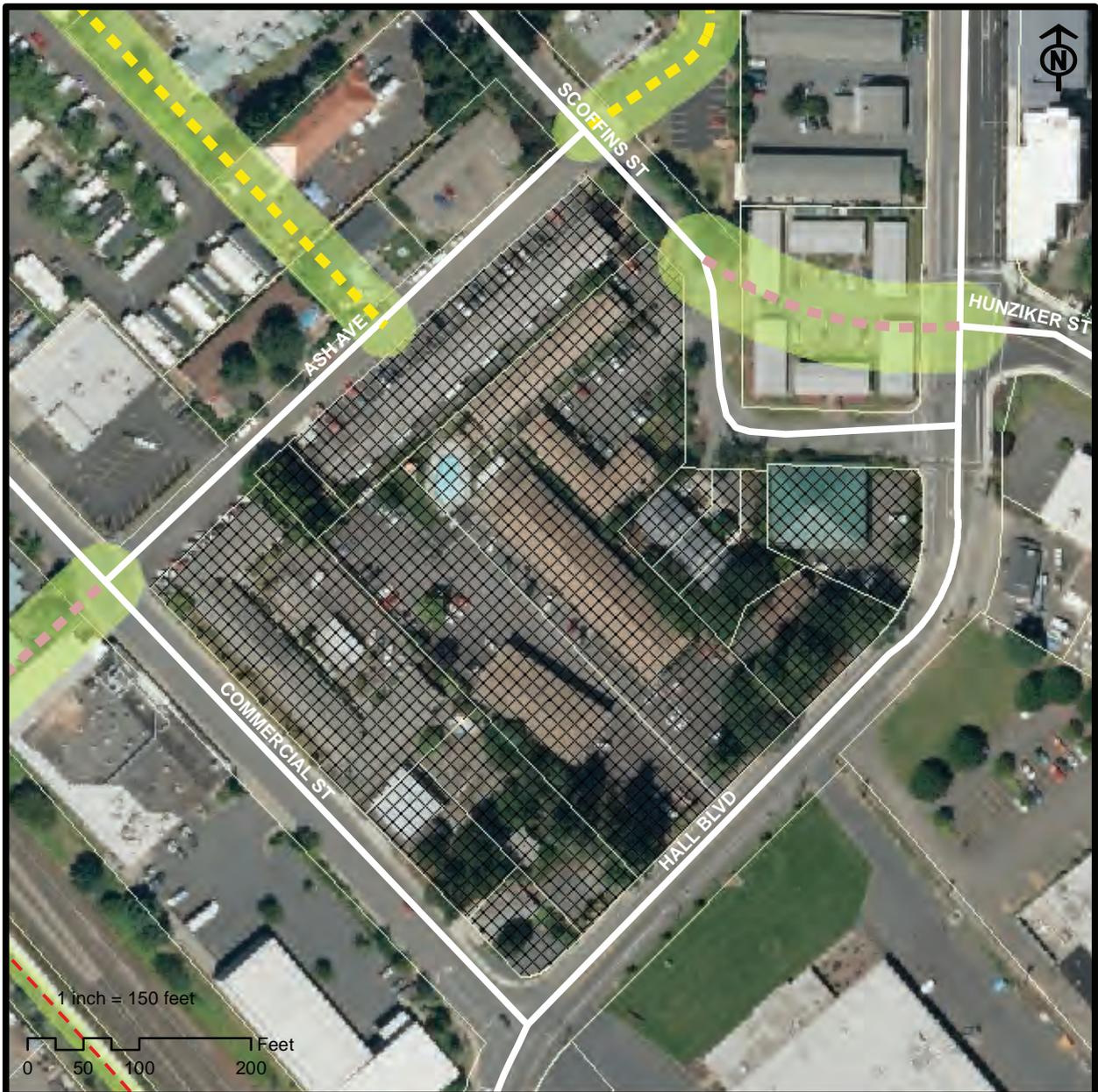


Figure 5-14F. Connectivity Projects Detail Sheet: Map 5

Character

- Downtown Mixed Use 1 (Collector)
- Downtown Mixed Use 2 (Local)
- Urban Residential (52'-56')
- Alley (20')

- Conceptual Connection
- Future Connectivity Alignment Area
- Required bike/pedestrian connections
- Existing Streets
- Taxlots

Note: The width of the Future Connectivity Alignment Area is equal to the upper end of the right-of-way range listed for the street character type.



Figure 5-14G. Connectivity Projects Detail Sheet: Map 6

Character	■ ■ Conceptual Connection
■ ■ Downtown Mixed Use 1 (Collector)	■ ■ Future Connectivity Alignment Area
■ ■ Downtown Mixed Use 2 (Local)	■ ■ Required bike/pedestrian connections
■ ■ Urban Residential (52'-56')	— Existing Streets
■ ■ Alley (20')	□ Taxlots

Note: The width of the Future Connectivity Alignment Area is equal to the upper end of the right-of-way range listed for the street character type.



Figure 5-14H. Connectivity Projects Detail Sheet: Map 7

Character

- Downtown Mixed Use 1 (Collector)
- Downtown Mixed Use 2 (Local)
- Urban Residential (52'-56')
- - Alley (20')

- Conceptual Connection
- Future Connectivity Alignment Area
- Required bike/pedestrian connections
- Existing Streets
- Taxlots

Note: The width of the Future Connectivity Alignment Area is equal to the upper end of the right-of-way range listed for the street character type.



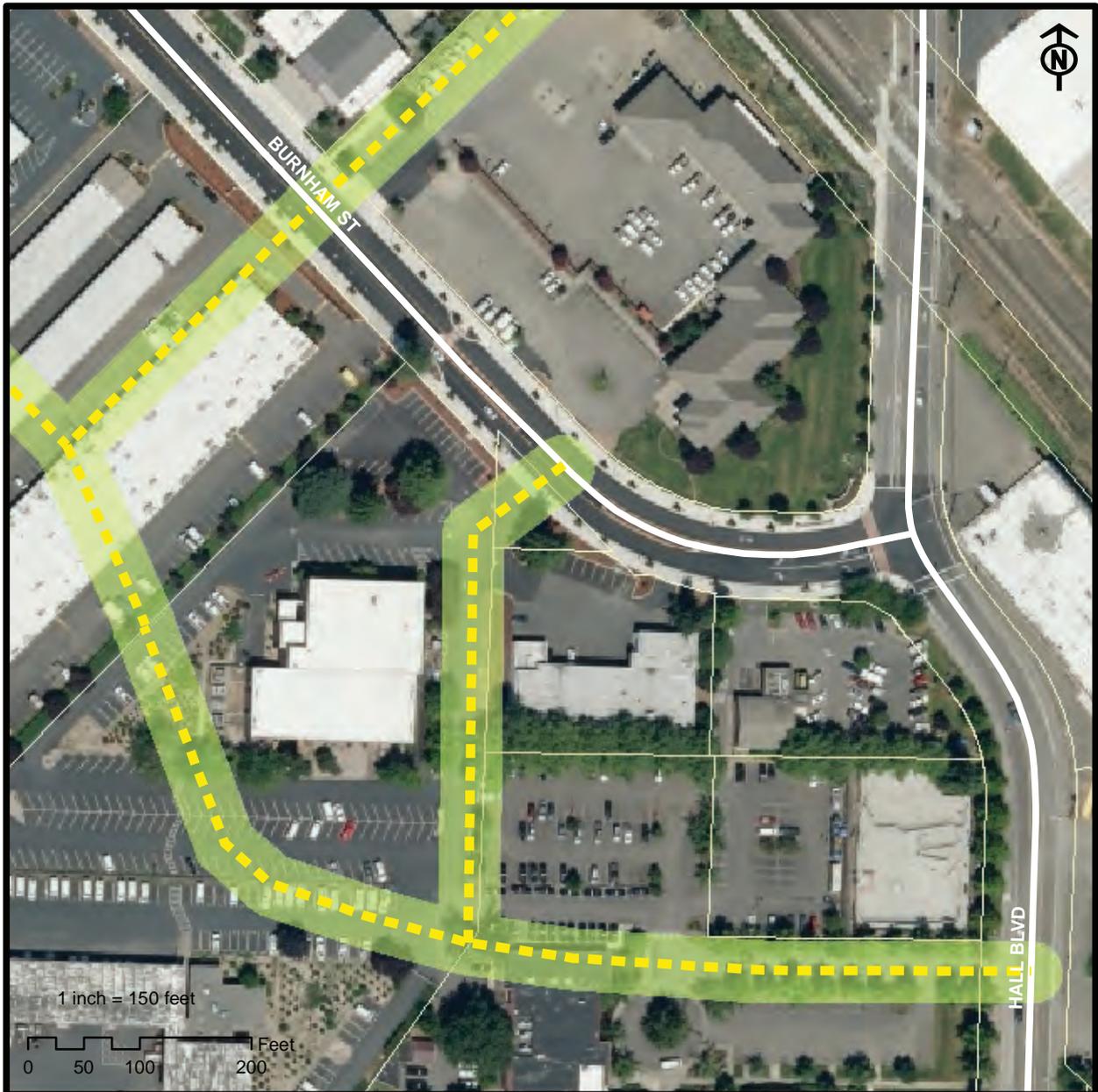
Figure 5-14I. Connectivity Projects Detail Sheet: Map 8

Character

- Downtown Mixed Use 1 (Collector)
- Downtown Mixed Use 2 (Local)
- Urban Residential (52'-56')
- Alley (20')

- Conceptual Connection
- Future Connectivity Alignment Area
- Required bike/pedestrian connections
- Existing Streets
- Taxlots

Note: The width of the Future Connectivity Alignment Area is equal to the upper end of the right-of-way range listed for the street character type.



Additional Travel Modes

This section summarizes the planned facilities for rail, air, water and pipeline needs in the City of Tigard.

► Rail

Railroad tracks traverse Tigard from its northern boundary to the southeast where the tracks cross the Tualatin River into the City of Tualatin and further south (parallel to I-5 to just north of Salem). Another set of tracks, just south of Bonita Road, turns east to Lake Oswego/Milwaukie and Southeast Portland. North of Tigard, the tracks go on into Beaverton and Hillsboro. They are both owned by Portland & Western (P&W), a sister company of Willamette & Pacific (W&P) Railroad.

Presently, all the grade crossings of the railroad and roadways in Tigard are controlled by gated crossings. There are a few private crossings which are not gated. Grade separation of the railroad crossings has not been determined to be necessary at any of the existing crossings. The highest volume at-grade crossing in Tigard is on Scholls Ferry Road. Because of the close proximity of the rail crossing to the Highway 217 interchange, potential future improvements on Highway 217 should consider the operational need of Scholls Ferry Road south of Highway 217¹⁷.

A commuter rail system, linking Wilsonville and Beaverton/Hillsboro currently operates on the P&W between Beaverton and Wilsonville. The system travels through Tigard with one stop in downtown Tigard. The RTP has plans to increase the frequency of service on this line which is supported by the city.

► Pedestrian/Bicycle Railroad Crossings

The existing freight and commuter rail corridor presents a barrier to access for pedestrians and bicyclists in Tigard. Although new multi-use pathways are desirable, current ODOT Rail policy related to at-grade crossings is to reduce the number of at-grade rail crossings. In particular, the 2001 Oregon Rail Plan expresses a desire for a reduction in at-grade railroad crossings within Tigard.

There are nine at-grade railroad crossings in Tigard, and one grade-separated crossing at Highway 99W. Of the ten crossings, six have existing sidewalks and five have bicycle facilities. Several track crossings are currently “demand” trails and not part of the formal or approved transportation system. These are worn paths across the tracks and could be used as locations for potential future grade-separated crossings for pedestrians and bicyclists. Currently, Grant Avenue ends at Tigard Street near the railroad tracks, directly across from 95th Avenue. There is a worn path across the tracks connecting these two roadways. There is another demand trail where Katherine Street ends at the west side of the railroad tracks.

¹⁷Outside the 20 year perspective of this plan, it may become necessary to consider a grade separation of the railroad crossing. While not part of this TSP, this concept should be considered in future planning of the Scholls Ferry Corridor. A grade separation concept may include a viaduct on Scholls Ferry Road from Highway 217 to south of Nimbus. Urban interchanges would need to be designed for Nimbus and Cascade. This viaduct approach may preclude the need for seven lanes on Scholls Ferry Road. This type of alternatives analysis would be necessary in the project development of any Scholls Ferry Road widening, Highway 217 widening and/or rail crossing changes.

In addition to crossings with existing demand, additional connections across the railroad tracks to the Tigard Transit Center would benefit pedestrians and bicyclists accessing transit lines. Currently, there are two connections on either side of the transit center, at Main Street and Hall Boulevard; however, these crossings are nearly 1,500 feet apart.

Any potential crossings needed for future multi-use pathways, for instance, connecting the Fanno Creek Trail with regional destinations such as the Tigard Triangle and the Washington Square Regional Center will need to be coordinated with ODOT Rail to ensure consistency with their policies.

▶ **Air**

Tigard is served by the Portland International Airport (PDX), located in Northeast Portland on the Columbia River. PDX is a major air transportation and freight facility, which serves Oregon and Southwest Washington. It provides a base for over twenty commercial airlines and air freight operations. Ground access to PDX from Tigard is available by automobile, taxi, shuttle and light rail which is not located in Tigard but has connecting service in Tigard via bus and the Westside Express Service.

Tigard is also served by the Portland-Hillsboro Airport, a general aviation facility located in the north central portion of the Hillsboro. The airport facility is owned and operated by the Port of Portland as part of the Port's general aviation reliever system of airports. The Port of Portland maintains a Master Plan for this facility.

No airports exist, or are expected, within the city in the future. Therefore, no policies or recommendations in this area of transportation are provided for Tigard.

▶ **Water**

The Tualatin River is located along the southern border of Tigard. It is used primarily for recreational purposes. No policies or recommendations in this area of transportation are provided.

▶ **Pipeline**

There are high pressure natural gas feeder lines owned and operated by Northwest Natural Gas Company along several routes in Tigard. The locations of these lines are not identified due to potential security concerns. No future pipelines are expected within the city. No changes to policies or investments are included in the 2035 TSP.

Section 6

Transportation
Funding

Transportation Funding Element

The 2035 Tigard Transportation System Plan (2035 TSP) includes projects under the jurisdiction of the city, state, county and other local jurisdictions. By extension, transportation capital improvements are typically funded through a combination of state, city, county, and private funds. This section documents Tigard's projected transportation revenues and estimated project costs, as well as summarizing other potential revenue sources.

Estimated Transportation Revenues

Tigard's transportation revenues were projected based on historic trends. Available funds are typically split between operating expenditures (i.e. maintenance, services, materials, etc.) and capital expenditures (i.e. new roadways, or pedestrian/bicycle facilities). The majority of the projects included in this document are considered capital expenditures. Table 6-1 provides a summary of the funding types available, the forecast revenues and the potential application of these revenues (operating, capital, or maintenance). As shown, the City of Tigard currently estimates revenues for transportation from 2011 to 2035 to be approximately \$1,750,000 per year (2009 dollars) for capital expenditures.

**TABLE 6-1: FUTURE CITY TRANSPORTATION REVENUES FOR CAPITAL PROJECTS
(2009 DOLLARS)**

Source	Forecast Annual City Revenues	Typical Use of Funds (Operating or Capital)	Forecast Annual City Capital Revenues	Percentage of Total Forecast Capital Revenues
State Motor Vehicle Fund	\$3,000,000 ¹	Operating (75%) Capital (25%)	\$750,000 ¹	43%
County Gas Tax	\$200,000	Operating (75%) Capital (25%)	\$50,000	3%
City Gas Tax	\$650,000	Capital (100%)	\$650,000	37%
TIF & TDT	\$300,000	Capital (100%)	\$300,000	17%
Street Maintenance Fees	\$1,700,000 ²	Maintenance (100%)	\$0	0%
Annual Total			\$1,750,000	100%
0–5 Year Revenues			\$8,750,000	
6–10 Year Revenues			\$8,750,000	
11–15 Year Revenues			\$8,750,000	
16–25 Year Revenues			\$17,500,000	
25-year Capital Revenues			\$43,750,000	

¹Once State Transportation Bill takes full effect in FY 2012/2013

²\$800,000 in 2010-11, \$1,175,000 in 2011-12, \$1,552,000 in 2012-13, \$1,700,000 each year after.

- ▶ The **State Motor Vehicle** fund has provided, and will likely continue to provide, the most significant portion of the funding for Tigard’s transportation system. A major component of the State Motor Vehicle fund is a fuel tax (per gallon).
- ▶ Together, the **City and County Gas Taxes** provide the second largest source of transportation funding to the city. It should be noted that House Bill 2001, passed in the 2009 legislative session, prohibits cities from raising fuel taxes between 2009 and 2014. Although the gas tax is recessive as vehicle efficiency increases, this is expected to be balanced out by the anticipated overall increase in vehicle miles traveled projected within the city.
- ▶ **Transportation Impact Fees** (TIFs) and **Transportation Development Taxes** (TDTs) are an excellent source of revenues for growth-required needs; however, TIFs and TDTs are only collected on development activity, so the revenue streams from TIFs and TDTs are volatile, depending on market conditions.

- ▶ The **MSTIP** is the Washington County Major Streets Transportation Improvement Program. The majority of county-funded road improvement projects are paid for via MSTIP, using local property taxes. It is difficult to project how much MSTIP funds will be spent on county roads within the City of Tigard on any given cycle. The amount provided above represents an anticipated annual average.

Bonds were not considered as a potential revenue source as they do not increase revenue; rather, they allow the city to spend several years' worth of anticipated revenues over a short period of time. In addition to the general revenue sources identified in Table 6-1, Washington County and ODOT typically allocate funding to projects within the city on their facilities. Estimates of annual revenues that are not at the discretion of the city, but that are spent on roadway facilities within the city, are shown in Table 6-2.

TABLE 6-2: FORECAST NON-CITY TRANSPORTATION REVENUES FOR CAPITAL PROJECTS (2009 DOLLARS)		
Source	Forecast Annual Non-city Capital Revenues	Percentage of Total Forecast Non-city Capital Revenues
MSTIP Funds used in city	\$500,000 ¹	50%
Potential State/Federal Fees used in city	\$500,000 ¹	50%
Annual Total	\$1,000,000	100%
0–5 Year Revenues	\$5,000,000	
6–10 Year Revenues	\$5,000,000	
11–15 Year Revenues	\$5,000,000	
16–25 Year Revenues	\$10,000,000	
25-year Revenues (Cumulative)	\$25,000,000	

¹Project specific. Amount listed is an estimate based on historical annual average.

Estimated Transportation Project Costs

The estimated costs of the comprehensive multi-modal improvements identified in Section 5 are summarized in Table 6-3.

TABLE 6-3: TRANSPORTATION PROJECT COST SUMMARY BY PRIORITY		
PRIORITY	ALL PROJECTS	FINANCIALLY CONSTRAINED LIST
Near-term	\$220,610,000	\$175,130,000
Mid-term	\$196,770,000	\$94,760,000
Long-term	\$247,310,000	\$20,190,000
Annual Total	\$664,690,000	\$290,080,000

As shown in the table, the total project costs far exceed the approximately \$69 million in transportation revenue that will be available to the city for capital improvements over the planning horizon. There are several reasons for the significant discrepancy between anticipated City resources and estimated costs. First, it is understood that many of the projects identified in Section 5 will not be constructed within the planning horizon of the TSP. However, it is valuable to identify these projects as potential solutions to existing and forecast needs. Identifying these potential transportation improvements helps ensure that the city preserves right of way for future projects and also that it can respond to opportunities in transportation and land development.

Also, the majority of transportation projects will require partnerships with other agencies or private developers. In some cases, the city may be responsible for a small percentage of project costs. This is especially true of large projects on county or state owned facilities, such as interchange projects on the freeway system. In some cases projects will be constructed as part of larger developments and will be funded in part by private developers. The financially constrained project list incorporates potential capital from all known public and private sources.

Other Potential Funding Sources

There is a significant disparity between the total cost of the projects identified in the 2035 TSP and the projected revenues. Some additional potential local transportation system funding sources the city may wish to consider include: 1) transportation utility fees; 2) urban renewal districts; and/or 3) local improvement districts (LIDs). Each of these alternative funding sources is described below, followed by descriptions of several state grant programs for transportation funding.

▶ **Transportation Utility Fee**

The City of Tigard currently has a Street Maintenance Fee which is a form of a Transportation Utility Fee. The city’s current fee is dedicated to street maintenance projects only. Transportation Utility Fees are based on consideration of transportation systems as utilities just like public water, wastewater or stormwater systems. Fees are typically assessed by usage (e.g., average vehicle trips

per development type). A growing number of cities in Oregon are adopting transportation utility fees that also fund capital projects, including pedestrian and bicycle projects.

▶ **Urban Renewal District**

An Urban Renewal District is an area that is designated by a community as a “blighted area” to assist in revitalization. Funding for the revitalization is provided by urban renewal taxes, which are generated by the increase in total assessed values in the district from the time it was first established. Tigard has an established urban renewal districts in the Downtown Tigard area of the city.

Urban Renewal dollars can be used to fund infrastructure projects such as roadway, sidewalk or transit improvements. Since funding relies on taxes from future increases in property value, the city may seek to create a district where such improvements will likely result in such an increase.

▶ **Local Improvement Districts (LIDs)**

Under a Local Improvement District (LID), a street or other transportation improvement is built, and the adjacent properties that benefit are assessed a fee to pay for the improvement. LID programs have wide application for funding new or reconstructed streets, sidewalks, water/sewer, or other public works projects. The LID method is used primarily for local or collector roads, though arterials have been built using LID funds in certain jurisdictions.

▶ **State Grant Programs**

The following programs provide project specific grants for transportation funding and should be explored on an on-going basis.

▶ **Community Development Block Grants (CDBG)**

CDBG Program funds are offered through the Federal Department of Housing and Urban Development although administered through the state. To receive CDBG funds, cities must compete for grants based upon a formula that includes factors such as rural/urban status, demographics, local funding match and potential benefits to low-to-moderate income residents, including new job creation. CDBG funds can also be used for emerging public work needs.

▶ **Special Public Works Funds (SPWF) and Immediate Opportunity Funds (IOF): Lottery Program**

The State of Oregon through the Economic and Community Development Department provides grants and loans to local governments to construct, improve, and repair public infrastructure in order to support local economic development and create new jobs.

SPWF and IOF funds have been used in a number of cities for the construction of water, sewer, and limited street improvements. These funds are limited to situations where it can be documented how a project will contribute to economic development and family-wage job creation.

▶ **State Bicycle-Pedestrian Grants¹⁸**

ODOT’s Bicycle and Pedestrian Program administers two grant programs to assist in the development of walking and bicycling improvements: local grants and Small-Scale Urban Highway

Pedestrian Improvement (SUPI) programs. For both these grants, cities that have adopted plans with identified projects will be in the best position to receive grants. Cities and counties can apply for local grants for bicycle and pedestrian projects within the right-of-way of local streets. Local grants up to \$100,000 are shared 80% state and 20% local. Projects that consider the needs of children, elderly, disabled, and transit users are given special consideration.

In the SUPI process, cities and counties help ODOT identify sections of urban highways where improvements are needed. Examples of eligible projects include:

- ▶ completing short missing sections of sidewalks;
- ▶ Americans with Disabilities Act (ADA) upgrades;
- ▶ crossing improvements (e.g., curb extensions, refuges, crosswalks); and
- ▶ intersection improvements (e.g., islands and realignment).

SUPI projects are located on highways that have no modernization projects scheduled for the foreseeable future. Projects that have a local funding match are typically viewed the most favorably because this indicates strong local support. Projects on highways that cost more than \$100,000, require right-of-way or have environmental impacts, need to be submitted to ODOT for inclusion in the Statewide Transportation Improvement Program (STIP). Cities and counties can apply annually for bike path or sidewalk grants of projects they have selected. Grants for projects on local street systems have a match of 20 percent and projects next to state highways have a lower match requirement. Bicycle-pedestrian grants are generally below \$125,000 per project. Project evaluation and selection is made annually statewide by the Statewide Bicycle/Pedestrian Committee.

▶ **ODOT Transportation Enhancement Program**

The ODOT Transportation Enhancement Program provides federal highway funds for projects that strengthen the cultural, aesthetic, or environmental value of the transportation system. The funds are available for twelve “transportation enhancement activities,” which are categorized as:

- ▶ Pedestrian and Bicycle projects;
- ▶ Historic Preservation related to surface transportation;
- ▶ Landscaping and Scenic Beautification; and
- ▶ Environmental Mitigation.

The Enhancement Program funds special or additional activities not normally required on a highway or transportation project. So far, Oregon has funded more than 150 projects, for a total of \$63 million. Enhancement Grants are available through an ODOT process that awards construction funds for three fiscal year periods at a time with applications typically due in spring. The most recent application was in 2008 to fund projects from 2011 to 2013.

▶ **State Parks Funds**

Recreational Trails Grants are national grants administered by the Oregon Parks and Recreation Department (OPRD) for recreational trail-related projects such as hiking, running, bicycling, off-road motorcycling and all-terrain vehicle riding. OPRD gives more than \$4 million annually to Oregon communities and has awarded more than \$40 million in grants across the state since 1999.

¹⁸Source: <http://www.oregon.gov/ODOT/HWY/BIKEPED/docs/mainstreethandbook.pdf>

Section 7

Implementation Plan

Implementation Plan

The Transportation Planning Rule (TPR), as codified in OAR 660-012-0020(2)(h), requires that local jurisdictions identify land use regulations and code amendments needed to implement the TSP and include them as the implementation element of the TSP. To that end, recommended changes to the city's planning regulations needed to implement the TSP are provided in *Technical Memorandum #6: Draft Implementation Plan in Volume 2 of the Technical Appendix*.

The implementation measures are based primarily on policy and code deficiencies that were identified in the Document Review and Issues Report (Issues Report), *Technical Memorandum 2 in Volume 2 of the Technical Appendix*, which assessed the consistency of the existing Tigard TSP and Community Development Code with regulatory requirements. The implementation measures also reflect projects and recommendations in the TSP as well as discussions with project team members.

The recommended implementation measures address the needs of the transportation dependent and disadvantaged; system connectivity; ways of supporting and promoting walking, biking and taking transit; and the treatment of transportation facilities in the land use planning and permitting process. Most of the measures involve changes to the Tigard Community Development Code (TCDC), or "code."

The implementation measures that reflect strategies identified in the TSP emphasize maximizing the capacity of existing and recommended facilities and, in particular, encouraging modes other than driving alone because an increase in transit, walk and bike mode shares is essential to the future transportation system in Tigard. These measures constitute a combination of potential amendments to the city's code or Comprehensive Plan, as well as additional planning, and administration and programming to be coordinated by the city.

Section 8

Glossary

Glossary

- ▶ **ACM:** Active Corridor Management: strategies to improve traffic flow by expanding traveler information and upgrading traffic signal equipment and timing
- ▶ **Bio-swale:** A landscape element that captures storm water and filters pollutants before allowing the water to enter the drainage system
- ▶ **CAC:** Citizen Advisory Committee
- ▶ **Complete street:** Roadway optimized for multi-modal transportation, including facilities for motor vehicles, pedestrians and bicycles, and providing drainage and landscaping where appropriate
- ▶ **GHG:** Greenhouse gas
- ▶ **HCT:** High capacity transit
- ▶ **LOS:** Level of Service; average delay experienced by motor vehicles at an intersection
- ▶ **Mode share:** percentage of travel using a particular mode (e.g. biking, walking, driving, etc.)
- ▶ **Multi-modal (transportation system):** a transportation system accommodating multiple travel modes, including motor vehicles, pedestrians, transit, and bicycles
- ▶ **NTM: Neighborhood Traffic Management:** utilization of traffic control devices in residential neighborhoods to slow traffic, or possibly reduce the volume of traffic - also called “traffic calming”
- ▶ **OAR:** Oregon Administrative Rules
- ▶ **ODOT:** Oregon Department of Transportation
- ▶ **ORS:** Oregon Revised Statutes
- ▶ **Pedestrian-actuated:** Activated by pedestrian, either by push-button or sensor
- ▶ **RTP:** Regional Transportation Plan: for the Portland region, the RTP is developed by Metro to provide a regional framework for transportation planning and investment, including implementation of Metro’s 2040 Growth Concept
- ▶ **SOV:** Single occupancy vehicle
- ▶ **TAC:** Technical Advisory Committee
- ▶ **TDM:** Travel (or Transportation) Demand Management: any method intended to shift travel demand from single occupant vehicles to non-auto modes or carpooling, travel at less congested times of the day, or help people reduce their need to travel altogether
- ▶ **TSMO:** Transportation System Management and Operations: TSMO is the term used in Metro’s Regional Transportation Plan (RTP) Update emphasizing corridor management measures to improve traffic flow on arterials. Measures include strategies such as traveler information, upgrading traffic signal equipment and timing, and signal enhancements that detect and prioritize transit vehicles at signalized intersections
- ▶ **WACO:** Washington County
- ▶ **WSRC:** Washington Square Regional Center