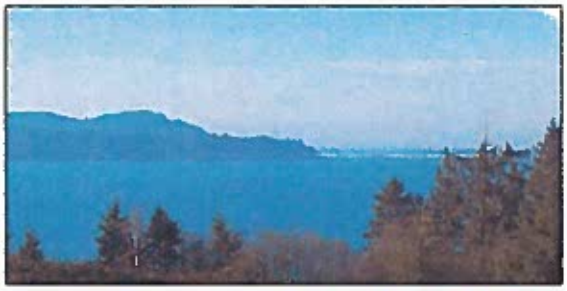
CITY OF BAY CITY TRANSPORTATION Plan



Our transportation system is part of everyday life and the backbone of our community. We rely on transportation systems to get us where we are going, to transport goods to and from the community, and to connect us to the services we depend on. Not only do our lives and economic livelihoods depend on access to transportation, it can also affect how our community looks and how we live. Transportation facilities can define the character of our neighborhoods, providing safe and efficient ways for our families to get around to all kinds of activities.

The transportation system also affects how we spend our money. Transportation infrastructure is the single largest public investment and asset that a city can own and manage. The taxes and fees that we pay help to support development and maintenance of the system and can affect the price of goods and services by reducing or increasing how long it takes people and goods to get around.

As a community, the City of Bay City has a right and responsibility to help make decisions about how their transportation system is managed and what it becomes. The Bay City Transportation Plan is a blueprint for how our community can help move forward and build the transportation system that will make this a great community to live in. The plan has been developed through a broad public involvement program to reflect the desires of the people who live and travel in Bay City.

The Bay City Transportation Plan was developed in 2009. It is the result of numerous stakeholder meetings, town hall meetings, and technical analyses. The Plan seeks to set a vision for transportation planning in Bay City, and to integrate that vision with the City's adopted policy, code, and standards. The Plan also provides a list of needed transportation improvement projects, estimates of costs, and initial determinations of funding sources.

The completion of the Bay City Transportation Plan was partially funded by a grant from the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. This TGM grant is financed, in part, by federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), local government, and State of Oregon funds. The contents of this document do not necessarily reflect views or policies of the State of Oregon.

Table of Contents

Introduction

The development of the plan was very informative for staff, citizens, and decision-makers. Throughout the process, different proposed projects and proposed policies were developed, discussed, and debated. Some of the initial designs for transportation improvements were eliminated from considerations. Others remained, and were refined through further technical work, public involvement and coordination within state agencies. Technical memoranda #2 was prepared to identify and evaluate potential transportation improvements designed to meet transportation needs identified in Technical Memorandum #1. Since the completion of technical memorandum #2, in the late spring, the list of projects and the designs for specific projects changed considerably. The most recent and agreed upon elements of the plan can be found in the Executive Summary.

In Technical Memorandum #3, the final recommended code and policy amendments can be found. These are intended for consideration by the Bay City Planning Commission and City Council. The Transportation Plan Project Advisory Committee spent much of the year developing these recommendations, and introduced the recommendations to the public in a Town Hall Meeting. The recommendations are to be introduced in Planning Commission and Council hearings either as a group or individually. Following adoption of new policy or codes, the City can revise the Executive Summary removing references to recommendations. The Executive Summary can, following adoption, reflect the final policy and code language.

The Bay City Transportation Planning Process

Project Objectives

The purpose of the Bay City Transportation Plan is to address key issues related to transportation in Bay City, including safety at Highway 101 intersections, connectivity across Highway 101, connectivity within Bay City off of Highway 101, and safe routes for bicyclists and pedestrians. The Bay City Transportation Planning project identifies key transportation-related issues in Bay City, developed facility design and operation solutions for these issues, and recommended changes to the Bay City Development Code to implement recommended transportation solutions. The Bay City Transportation Plan project assures consistency of recommendations with local and state policies, plans, and rules.

The objectives of the Bay City Transportation Plan project were defined in the scope of work and the agreement signed between Bay City, the Oregon Department of Transportation (ODOT), and the Oregon Department of Land Conservation and Development (DLCD).

These objectives include:

1) To identify development standards and improvements for safe intersections with US 101;
2) To identify specific street right-of-way development standards for streets within the city and urban growth boundary based on potential future land use;
3) To identify development standards and improvements that will effectively manage traffic speeds, increase connectivity and enhance safety for Bay City and the area within its urban growth boundary;
4) To provide ordinance amendments that will effectively enact the administration of identified development standards;
5) To provide written and graphic identification of development standards and improvements to a scale and quality suitable to submit applications to potential grant programs and funding agencies; and
6) To identify funding mechanisms including taxes, road maintenance district fees, traffic impact fees, and SDC fees suitable to implement development standards and improvements.

Background Data and Documents

As an initial step in the planning process, the consultant team reviewed applicable City, County, and State plans and policies relevant to the transportation planning process. The purpose of this review was to provide a policy context for the planning effort, help ensure that proposed projects were consistent with existing relevant plans and policies, and aid in the development of implementing ordinances for the transportation plan. The consulting staff reviewed documents for the jurisdictions that own, regulate or provide public services on the transportation system in Bay City. These jurisdictions include Bay City, Tillamook County, the Tillamook County Transportation District (TCTD) and the State of Oregon. Some of these documents offer guidance for the refinement plan and provide information that is reported in this technical memorandum. Other reviewed documents had little bearing on the development of the Plan.

The project team completed a review of the applicable state and federal plans and programs, as well as numerous local plans, sets of standards, and other materials. The following documents were reviewed:

- Oregon Transportation Planning Rule
- Oregon Transportation Plan
- Oregon Highway Plan
- Oregon Rail Freight and Passenger Plan
- Oregon Public Transportation Plan
- Oregon Bicycle and Pedestrian Plan
- Oregon Highway Design Manual
- Statewide Transportation Improvement Program
- Oregon Transportation System Planning Guidelines
- Bay City Comprehensive Plan
- Bay City Downtown Transportation Plan
- Bay City Development Ordinance and Zoning Map
- Bay City Standard Details and Technical Specifications
- Geologic and Geotechnical Hazards Assessment
- Bay City Street Ordinance
- Bay City Tax Assessor Plat maps
- Bay City Aerial Photographs
- Bay City Local Wetland Inventory
- Bay City Stormwater Drainage Master Plan
- Emergency response plans (including tsunamis)

Background

The portion of US Highway 101 in Bay City has eight intersections with local streets. Several of these intersections are tightly spaced on Highway 101, have poor visibility, and provide access to two or more local streets right off of the Highway. This concentration of activity, potential turning movements, and poor visibility have created safety concerns at Highway 101 intersections in Bay City. Five of these unsafe accesses, Hayes Oyster Drive, Fifth Street, Tillamook Avenue, McCoy Street, and Warren Street also enter High Intensity Zone business and industrial use districts or Moderate Intensity Zones that include Community Public Facilities.

The majority of Bay City is located east of Highway 101. Bay City lacks adequate north-south street connections within its Urban Growth Boundary area, so drivers must use Highway 101 to make local trips within Bay City. Poor street connectivity within Bay City also reduces the number of safe and convenient routes for bicyclists, pedestrians, and Neah-Kah-Nie School District students. Bay City lacks a safe crossing of US Highway 101 and connectivity between the East and West portions of the City. This requires the community to be reliant upon vehicular transportation for safe access the business and community public facility areas. Current development standards do not address traffic calming or other measures to keep vehicular traffic at posted speeds and maintain the safety of pedestrians and bicyclists.

A residential neighborhood in the southwest portion of Bay City that is west of Highway 101 is accessed via Warren Street. Warren Street provides the only access for this residential coastal shoreland neighborhood. A slight misalignment of the narrow Warren Street right-of-way at the Highway 101 intersection makes crossing Highway 101 difficult at this intersection. In addition, operation of the Port of Tillamook Bay railroad that parallels Highway 101 to the west through Bay City poses the potential to block access to Warren Street and the neighborhood west of Highway 101.

A Downtown Transportation Plan was written under a previous grant and completed in 2003. This Plan provides findings and recommendations for streetscape development in the Bay City downtown North High Intensity Zone and has not yet been adopted. Elements of the Downtown Transportation Plan have been integrated with the findings and recommendations of this City-wide Plan.

Project Management

The City managed the planning project. The City shall provided data, reviewed and commented on project deliverables, advertised meetings, coordinated mailings, participated in project committees, and performed support logistics for project meetings. The consultant firm, Parametrix, performed the technical analysis and design tasks, prepared project materials, and facilitated project meetings. Staff from ODOT and Tillamook County also provided valuable guidance during the planning process.

Technical Analyses

The project team developed an analysis of future transportation demand, system capacity, and resulting transportation conditions in Bay City. The analysis of future demand, capacity, and conditions was completed by using information and data obtained during the assessment of existing conditions and deficiencies. The future year for the analysis was set at 2030. Trip generation was estimated using assumptions for future residential, industrial and commercial land uses and densities based on existing Comprehensive Plan designations and the coordinated population forecast for Tillamook County. Future land uses also reflected assumptions about rates of redevelopment and employment growth in Bay City.

As part of the technical work, which is outlined in detail in the following technical memoranda, the project team completed analysis of: the local street system and street standards, local pedestrian/bicycle system, as well as planning level costs and funding strategies.

Lastly, the project team assessed the Bay City Development Code and recommended amendments necessary to ensure consistency and to implement recommended design solutions. The team reviewed relevant adopted local plans, including the Bay City Comprehensive Plan and Bay City Downtown Transportation Plan, the Bay City Street Standards, and the Bay City Street Ordinance to ensure consistency between recommendations resulting from this Project and these adopted plans.

Public Involvement

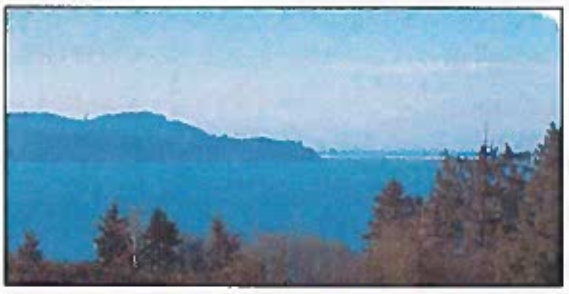
The technical findings and recommendations developed by the team were refined through a long-term public involvement process. The process included field visits, formation and five meetings of the Project Advisory Committee (PAC), two Town Hall Meetings, work sessions with the City Council and Planning Commission, as well as final adoption hearings. Project materials were made available to all who inquired and were available on the web and at City Hall.

CITY OF BAY CITY

TRANSPORTATION

Plan

Executive Summary



Bay City Transportation Plan

This Bay City Transportation Plan Executive Summary includes major findings of the Bay City, Oregon, Transportation Refinement Process completed in 2009. The following parties provided invaluable direction and worked diligently toward the completion of the Plan.

Project Advisory Committee Members

Zola Andrews	**Resident**
Chuck Bartholet	**Resident**
Lin Downey	**City Staff**
John Gettman	**Resident and City Council Representative**
David Helton	**Oregon Department of Transportation**
Scott Neimann	**Resident**
David Pace	**Public Works Superintendent**
Sabrina Pearson	**City Planner**
Terry Spath	**Resident, Planning Commission Member and Cyclist**
John Sollman	**Resident and Planning Commission Representative**
Liane Welch	**Resident and Tillamook County Roads Department**
Phyllis Wustenberg	**Resident and Tillamook County Pioneer Museum Representative**

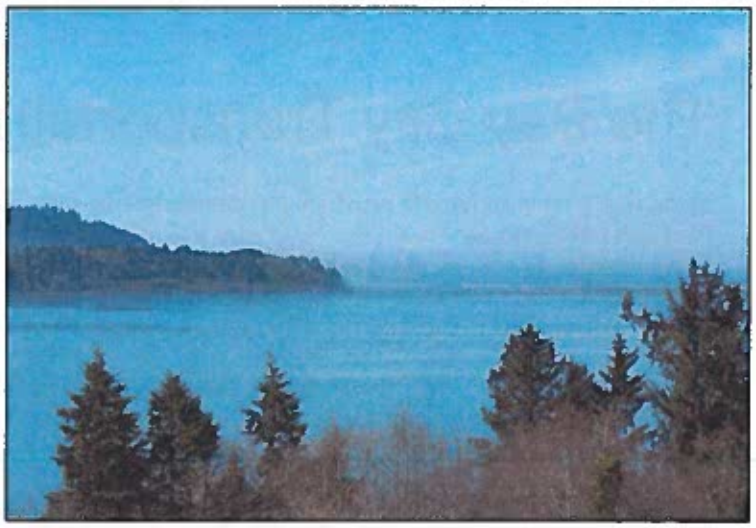
City Council / Mayor

Shaena Peterson (Mayor)
Aimee Fullan
John Gettman
Terri Neimann
Rebecca Smith
Ron Tewalt
Helen Wright

Planning Commission

Terry Griffin (Chair)
Chris Grant
John Sollman
Terry Spath
Judy Wadley
Carol Waggoner
Phyllis Wustenberg

This Bay City Transportation Plan Executive Summary is partially funded by a grant from the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. This TGM grant is financed, in part, by federal Transportation Equity Act for the 21st Century (TEA-21), local government, and the State of Oregon funds. The contents of this document do not necessarily reflect views or policies of the State of Oregon.



Background

The Bay City Transportation Plan is designed to provide for transportation planning through 2030, the Transportation Plan planning period.

The Bay City Transportation Plan Executive Summary is the adopted portion of the Bay City Transportation Plan; a summary of Technical Memorandums #1, #2, and #3, the background reports and recommendations provided during the planning process.

Bay City is a community of 1,195 people located on Tillamook Bay in Tillamook County, Oregon. Bay City is a charming small town located along US Highway 101, the Oregon Coast Highway. The majority of Bay City, including its downtown, is located east of Highway 101.

This Transportation Plan responds to transportation, land use, environmental, population growth, economic and social changes that have occurred in and near Bay City, as well as emerging issues and upcoming policy initiatives.

What does the Transportation Plan Executive Summary Include?

The Bay City Transportation Goal

Technical Memorandum #3 provides recommendations for amendments to the Bay City Comprehensive Plan and Development Ordinance necessary to implement the Bay City Transportation Plan. Technical memorandum #3 also includes recommended amendments to the Development Ordinance and the Public Works Standards. Once finalized and adopted, the new Transportation Planning Goal and policies will provide the foundation of ongoing plan implementation.

The goals of the Bay City Transportation Plan are written in the Bay City Comprehensive Plan and are implemented through ordinances such as the Bay City Public Works Standards and Bay City Development Ordinance.

Technical Memorandum #1 details the goals, policies, and plans that that provided the background information used to construct the Bay City Transportation Plan and Transportation Goal.

Technical Memorandum #3 provides amendment recommendations designed implement the Bay City Transportation Plan and the Bay City Downtown Transportation Plan written in 2003.

Before these recommended amendments can become a part of the City implementing ordinances, the City must hold a public hearing process to adopt them.

Functional Classifications

A functional classification system is a means of organizing the City's roadways and assigning design standards to each type of roadway. These classifications are based on existing and future anticipated land uses, steeply sloping terrain, and other factors. As shown in Figure 1, the City has the following functional classifications for public streets:

Arterial Streets: Arterials are intended to provide for high volume travel between or within communities.

Collector Streets: Collectors link residential neighborhoods with smaller community centers and facilities, and provide access to the arterial system. Bay City has Urban Collectors and special Urban Downtown Collectors for Downtown.

Local Streets: Local Streets provide for low-volume travel and access to immediately adjacent land; and connect housing, commercial, and industrial land with the collector and arterial system.

A description of how these functional classifications apply within the City of Bay City and its Urban Growth Area is provided in the section titled "Street Cross-Sections".

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N

0 500 1,000 1,500

Scale in Feet

Figure 1
Roadway Functional Classifications

Transportation Refinement Plan
Bay City, Oregon

Street Cross-Sections

These street (cross section) standards are adopted as part of the Bay City Development Ordinance (374) and the Public Works Standards. These cross-sections have been developed to address the need for enforceable, flexible standards. These cross sections provide for improved multimodal facilities, minimize impervious surface, incorporate improved drainage way designs, and provide a revitalized streetscape for the downtown.

Arterial Streets

Arterial streets primarily move people between destinations, link distant communities, and provide for higher speeds and greater volumes of traffic.

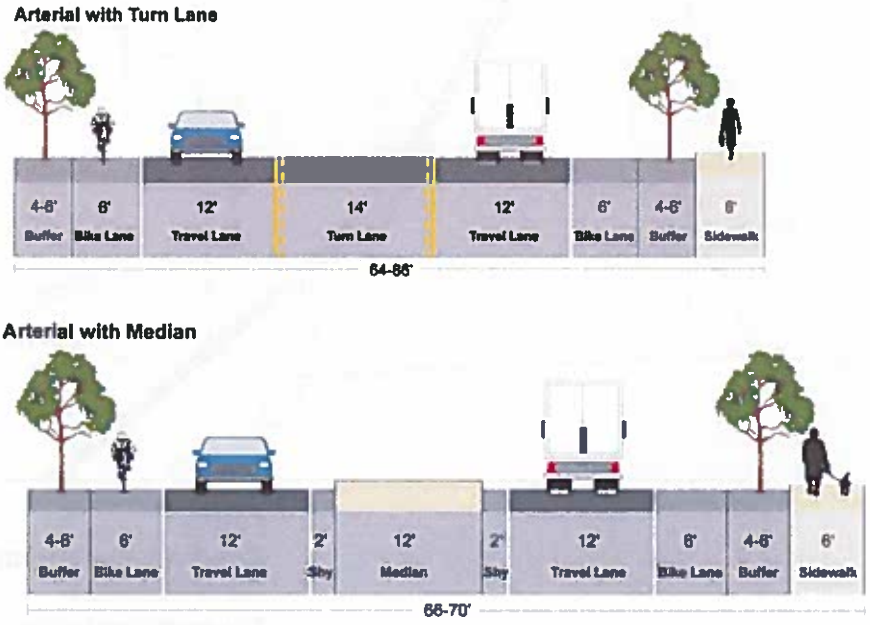
Within the City of Bay City and its Urban Growth Area, US 101 is the only roadway in Bay City designated as an arterial. As Bay City lacks adequate north – south street connections within its Urban Growth Boundary area, drivers must use US 101 to make local trips within Bay City requiring US 101 to play an important role in both local and through traffic circulation within Bay City.

The Bay City Transportation Plan provides two options for Arterial Street design; these options are shown in Figure 2. The Arterial Street design that is utilized will depend on the location of the right-of-way and the need for a turn lane. Both options provide a bike lane, a landscaped buffer, and sidewalk. If the City is successful in coordinating the provision of a bike and pedestrian shared pathway adjacent to the Port of Tillamook Bay Railroad rail line, a sidewalk will not be provided on the west side of US 101

US Highway 101 is a state facility, and the state designed and installed this state roadway. Revisions to US 101 are required to be consistent with the current edition of the Highway Design Manuel and other state regulations. The Arterial street cross-sections for Bay City are consistent with the current version of the Highway Design Manual. At the time any project on the state highway is to take place, the City will ensure that the project is consistent with the current regulations.

Figure 2 shows two types of arterial cross-sections.

Figure 2. Arterial Cross-Sections



Collector Streets

Collector Streets link residential and business areas with each other and to US 101, the Arterial Street in Bay City.

The Bay City North High Intensity Zone, or Downtown Bay City, is a network of Urban-Downtown Collectors Streets, shown in Figure One. This network of streets is designed to provide mobility for all modes of transportation and sufficient parking for downtown businesses with the existing right of way. The Bay City Downtown currently contains urban uses such as the City Hall, the Fire Station, the public library, the Landing Restaurant, Downies Restaurant, Art Space Gallery and Restaurant, the Bay City Art Center, the Post Office, Center Market Grocery Store, the City Park, the Skateboard Park and the City Campground and vacant land is still available for additional urban uses."

Two Urban Downtown cross section standards are provided [See Figure 3]. On 4th Street, A Street, and B Street, angled parking is provided and bicycles must share the vehicular travel lane. Members of the Project Advisory Committee expressed an interest in, and the benefits of providing, parking stalls perpendicular to the street rather than at an angle. This potential future modification of the street design requires additional study and should be considered during the design phase of the future downtown streetscape improvements. On 5th Street and C Street, also known as Hayes Oyster Drive, because of its intense urban character and the flat terrain, the cross-section includes parking, bike lanes and sidewalks on both sides of the streets.

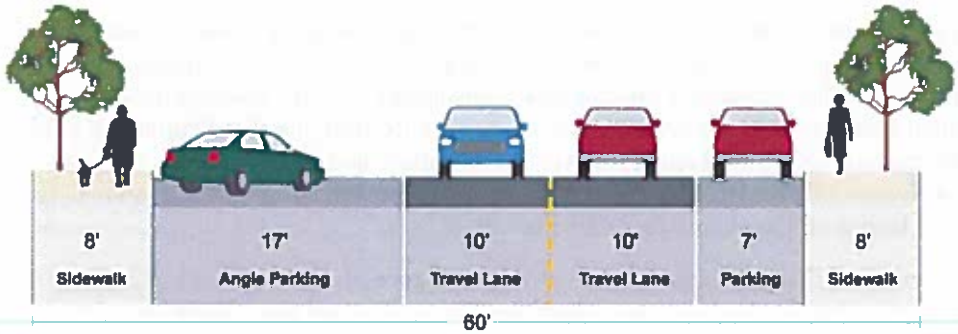
Outside the downtown area, Urban Collector Street designations for 5th Street, Tillamook Avenue, Warren Street and McCoy Street connect residential neighborhoods with the Arterial Street US 101. The width and terrain of these Urban Collector Streets requires a more flexible cross-section design.

The Urban Collector Street cross-section standards show bicycle lanes and sidewalks provided on both sides of the street where possible. Where conditions do not allow bicycle facilities, cyclists are expected to share the travel lane and signage should indicate this shared lane use. Where right-of-way for sidewalk facilities is limited, a sidewalk or pathway must be provided on one side for the length of street to provide a continuous walkway.

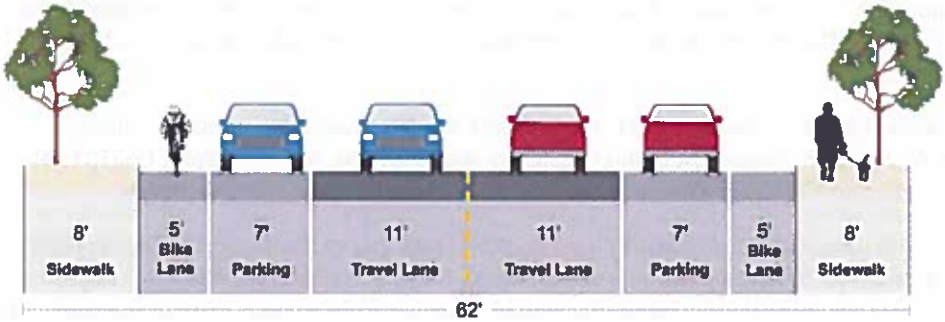
Urban-Downtown Collector and Urban Collector Street designations may be revised as future conditions change.

Figure 3. Collector Cross-Sections

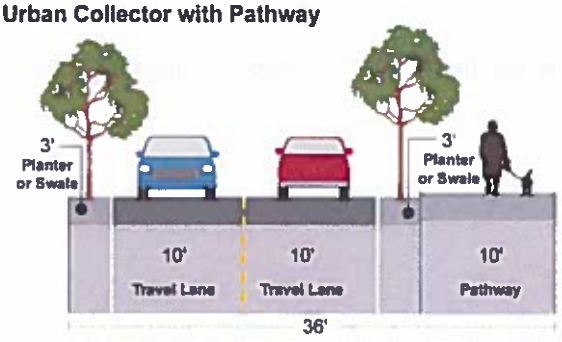
Urban Downtown Collector
4th Street, A Street and B Street



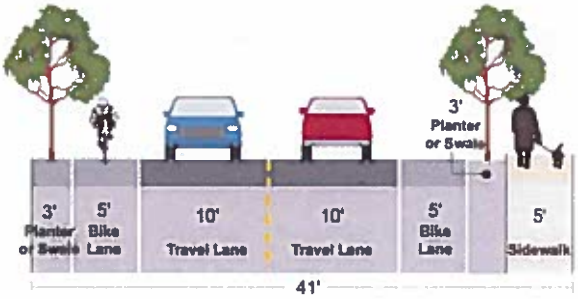
Urban Downtown Collector
5th Street and C Street



Urban Collector with Pathway



Urban Collector

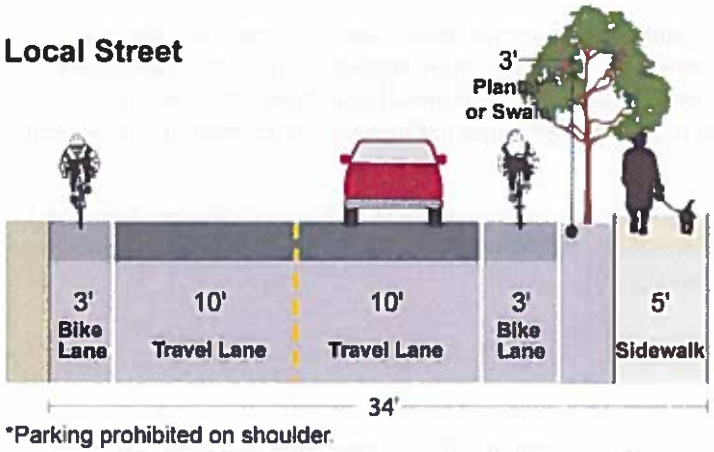


Local Streets

The streets in Bay City that are not designated as Arterial or Collector Streets are designated Local Streets. In Bay City, the Local Streets vary greatly in their current design, construction, and the number of dwelling units served. Some of the Local Streets are largely unimproved and are anticipated to remain in that state through 2030, the Transportation Plan planning period. Other Local Streets are likely to be improved, extended and generally reconstructed to be in compliance with the new Local Street cross-section standards shown in Figure 4.

Two options for Local Street cross section standards are provided for Bay City. One standard has a sidewalk and one does not. The sidewalk variation is due to the narrow width and steep terrain present in some rights of way where a sidewalk is not feasible. Where sidewalks cannot be provided, pedestrians are expected to share the travel lane. On Local Streets, bicycles are expected to share the vehicular travel lane.

Figure 4. Local Street Cross-Sections



Stormwater Management

Adequate stormwater drainage facilities are required as a part of any new development application. Vegetated swales, such as those depicted by the City of Portland 2004 Stormwater Management Manuel, are recommended where feasible. The Bay City Stormwater Master Plan also provides recommendations for the provision of stormwater drainage facilities.

Proposed Improvement Projects

The Bay City Transportation Plan provides proposed improvement projects that will contribute to the future transportation system of Bay City. Alternative designs were discussed throughout the planning process with the Project Advisory Committee, at Town Hall Meetings, with City Staff and with the Technical Advisory Committee provided by the Oregon Department of Transportation. Additional discussion of this process is provided in Technical Memorandum #1 and #2.

The proposed improvement projects are prioritized as projects anticipated to be completed "in the short term" by 2030, and projects that will be completed "in the long term" or if funding resources become available. Some proposed projects, such as an overhead pedestrian crossing of US 101 at Hayes Oyster Drive, include multiple phases that can be completed in the short term and the long term or if funding becomes available.

Technical Memorandum #1, provides the documentation of the traffic analysis performed for local intersections with US Highway 101 to determine whether any improvement projects were necessary for the intersections to be consistent with Oregon Highway Design Manuel Standards. The proposed improvement projects have been developed to address operation deficiencies in the system, known safety concerns, and other issues.

Drawings are provided for four of these proposed improvement projects in Figure 5 Warren Street and US 101, Figure 6 Fifth Street and Portland Avenue Intersection with US 101, Figure 7 McCoy Avenue and US 101 and Figure 8 Hayes Oyster Drive and US 101.

Warren Street and US 101

Two approaches of Warren Street to US 101 currently form an offset intersection that does not meet Highway Design Standards for a direct vehicular crossing. This situation poses a safety concern as some motorists cross US 101 between these segments of Warren Street. A realignment and new design of the intersection is recommended to improve function and safety and is shown in Figure 5. The new design will prevent direct crossings of US 101 from one segment of Warren Street to the other. The design will limit access to the highway, eliminating the most dangerous conflicting movements.

The segment of Warren Street that is located east of US 101 is recommended to be revised to allow only right-in and right out movements. This design will require that south bound motorists access Warren Street from McCoy Street to Warren Street and only north bound motorists will be able to enter Warren Street from US 101. The design will limit access to and from the highway, eliminating the most dangerous conflicting movements. Specifically, it would no longer be possible for a vehicle to turn left out of Warren into the center turn lane of US 101, which should be reserved for vehicles turning left out of West Warren, heading north. This new design is show in Figure 5.

The segment of Warren Street that accesses Goose Point west of US 101 has a poor alignment with US 101. Current standards require a nearly perpendicular alignment for approaches to state highways, enabling both directions of movement the visibility and acceleration necessary for safety. In addition to the poor alignment, traffic modeling provided in Technical Memorandum #1 shows the need for a dedicated left turn lane for north bound motorists on US 101. A realignment and new design of this intersection is recommended and shown in Figure 5. The new design provides a more perpendicular intersection and provides the left turn lane off of northbound US 101.

5th Street and Portland Avenue Intersection

The intersection of Portland Avenue, US 101, and 5th Street is a three way intersection poorly defined by signage, topography, and pavement markings. This intersection can be confusing to motorists. Confusion can cause safety issues as motorists exiting US 101 at 45 mph and motorists traveling from 5th Street to Portland Avenue conflict with no direction provided as to who should yield.

The 5th Street intersection with US 101 is important as a gateway to downtown Bay City that will be located at one beginning of the downtown streetscape proposed in the Bay City Downtown Transportation Plan (written in 2003, not yet adopted).

Figure 6 provides a recommendation to realign the roadway and provide striping to improve its definition and to reduce confusion. Although not shown, there should also be landscaping and other streetscape improvements in this area to improve its function as a gateway to downtown Bay City. Improvements at this intersection require coordination with ODOT as a good portion of the intersection and the landscaping area is located in the ODOT right-of-way.

McCoy Avenue and US 101

McCoy Avenue is poorly aligned with US 101 and inconsistent with Highway Design Manuel Standards. A realignment and new design is provided in Figure 7. The new design will better accommodate freight haulers and large vehicles that regularly access this street. McCoy Avenue will need to compensate for the lack of access to and from the east side of Warren Street after it is redesigned at its intersection with US 101.

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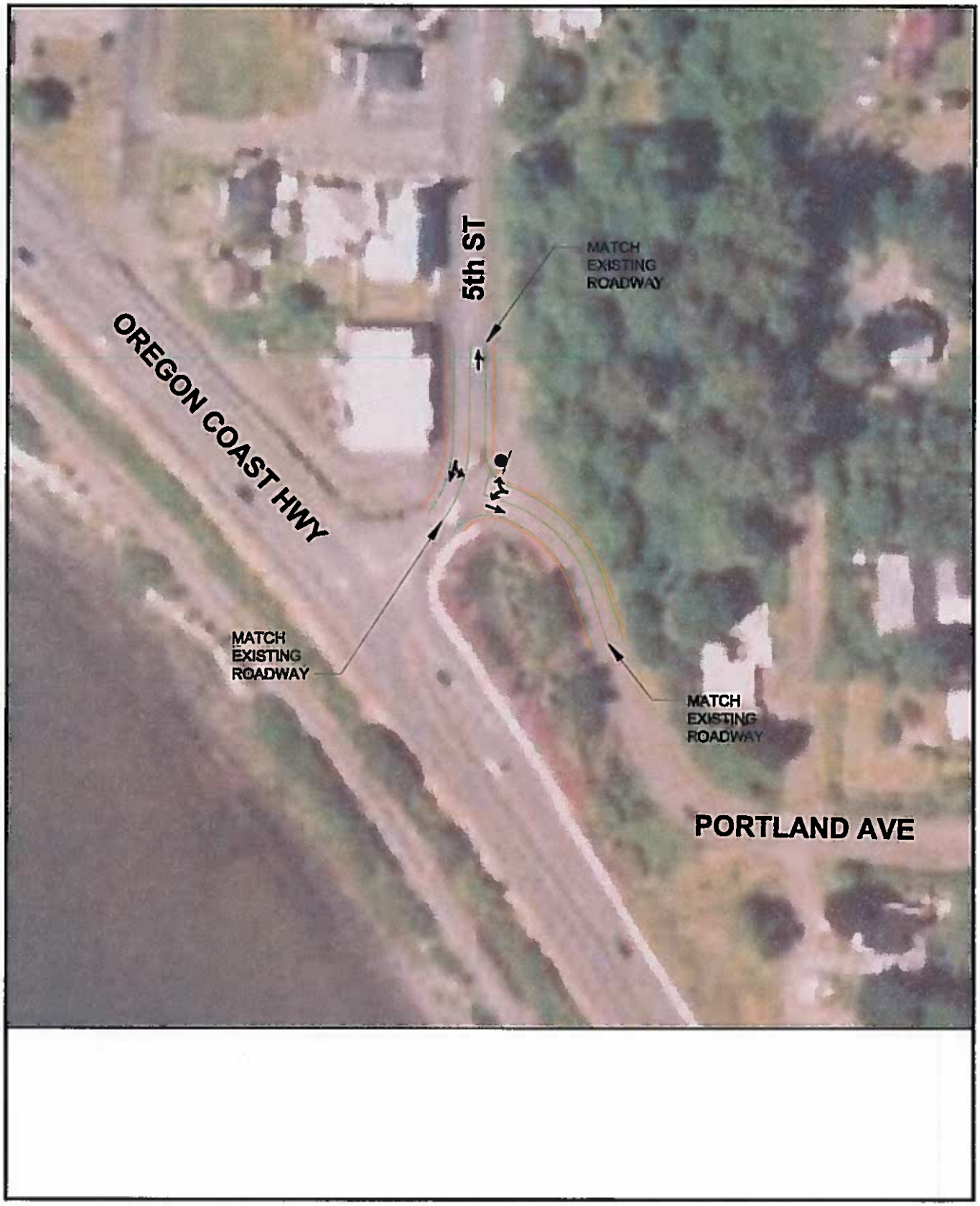
LEGEND

- EDGE OF PAVEMENT
- STRIPING
- ISLAND

N

Figure 5
Warren Street and US 101
IMPROVEMENT CONCEPT
BAY CITY, OREGON



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LEGEND

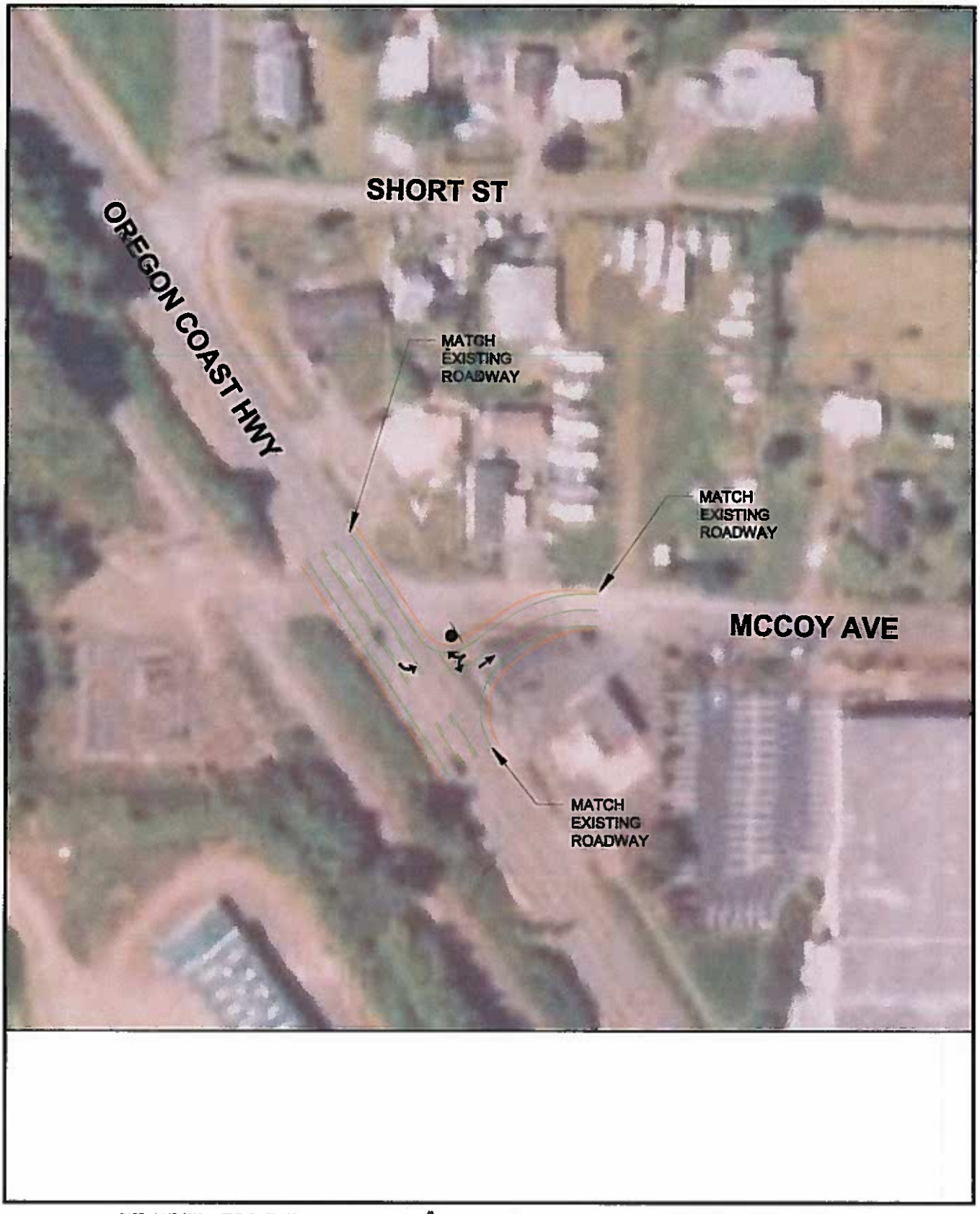
EDGE OF PAVEMENT
STRIPPING

N

0 100'

SCALE IN FEET

Figure 6
5th Street and Portland Ave Intersection
IMPROVEMENT CONCEPT
BAY CITY, OREGON



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LEGEND

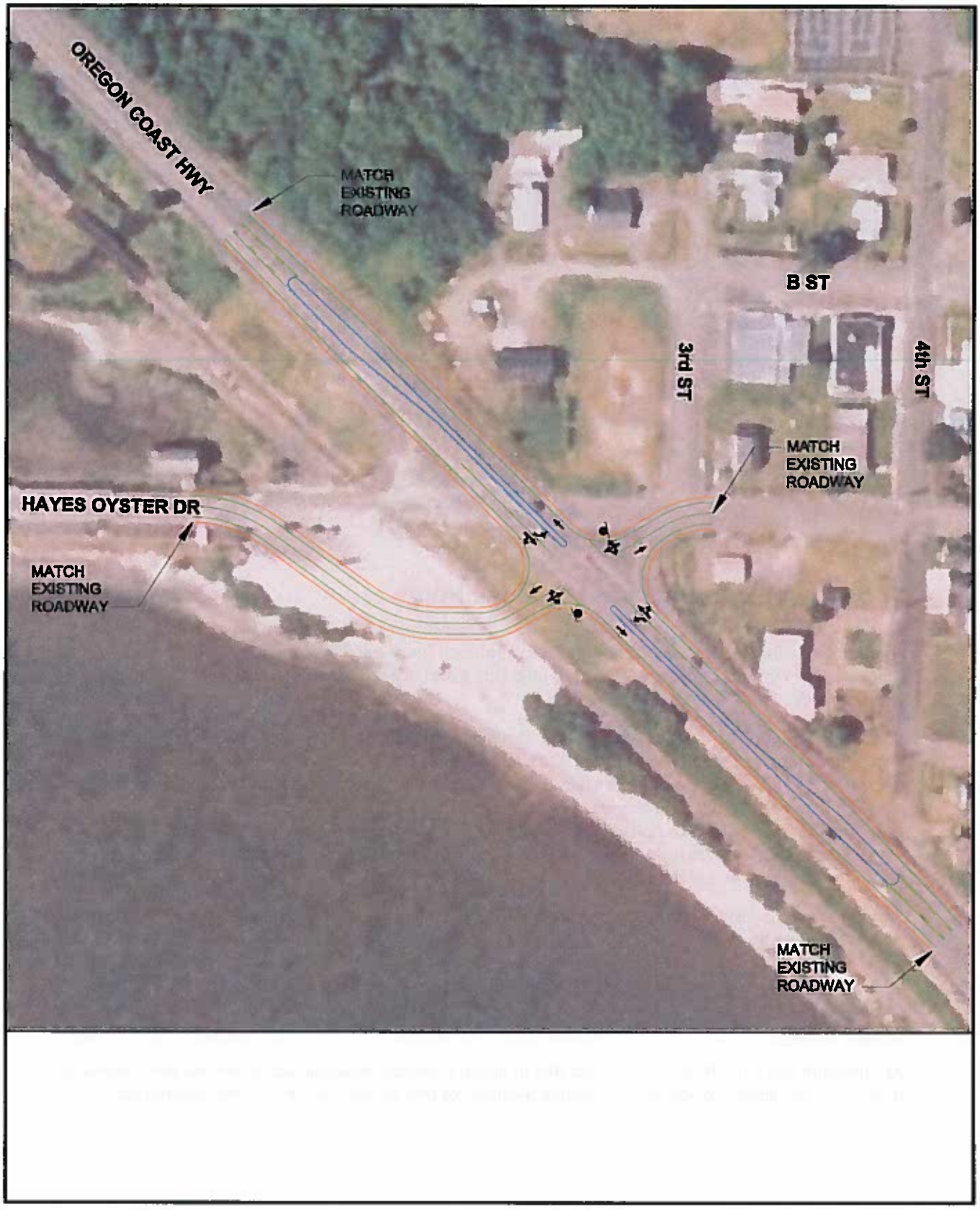
EDGE OF PAVEMENT
STRIPPING

N

0 100'

SCALE IN FEET

Figure 7
McCoy Avenue and US 101
IMPROVEMENT CONCEPT
BAY CITY, OREGON



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LEGEND

- MEDIAN CURB
- EDGE OF PAVEMENT
- STRIPPING

N

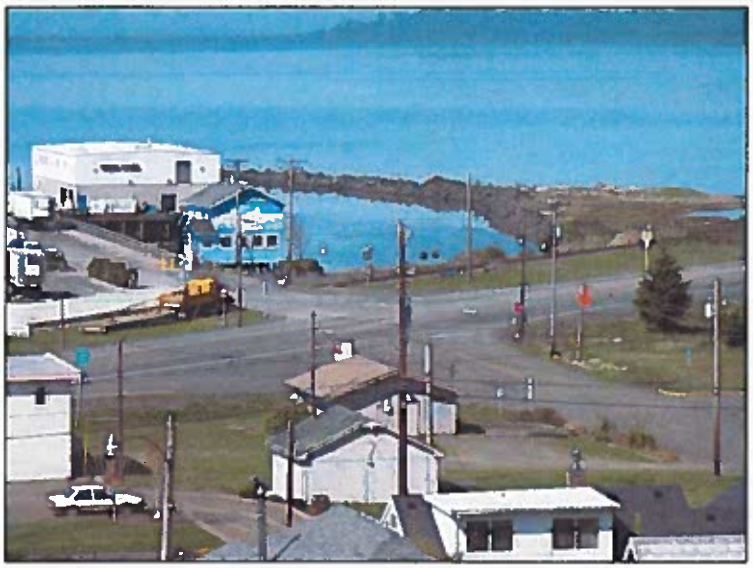
0 150'

SCALE IN FEET

Figure 8
Hayes Oyster Drive and US 101
IMPROVEMENT CONCEPT
BAY CITY, OREGON

Hayes Oyster Drive and US 101

In writing the Bay City Transportation Plan, and deliberating the recommended method of crossing US 101, the City considered a signalized crossing, an overhead crossing, landscaping and pavement delineations. A signalized crossing was not warranted because the minor movements (to and from Hayes Oyster Drive) had too few daily vehicles even in the planning year 2030. The analysis of the intersection operations is included in Technical Memorandum #1. An overhead crossing would be permitted, however at an extensive financial and land cost. The on and off ramp would need to be lengthy for the grade of the walkway to meet American with Disabilities Act Accessibility Guidelines. Additional discussion about constructing a safe crossing of US Highway 101 is provided in Technical Memorandum #2.



Second Vehicular Access to Goose Point

Access to the Goose Point neighborhood is currently provided only by Warren Street. This single access point requires the crossing of a currently inactive railroad line owned by the Port of Tillamook Bay Railroad. The current residents of Goose Point desire a secondary vehicular access to use in the event of an emergency.

After the platting of this section of Bay City, the Oregon Fire Code was revised and today, a second vehicular access is required to be provided to accommodate potential emergencies when there are more than thirty dwelling units on a single access. The number of dwelling units permitted on this single access has been increased to 200 as is permitted by an exception in the Oregon Fire Code when dwelling units install residential fire sprinklers. Development in the Goose Point area is limited by natural features such as the Tillamook Bay, wetlands, the public works shop and sewer treatment ponds, and the limited amount of land area zoned for development.

Providing a secondary vehicular access to US 101 to use in the event of emergencies requires a permit from ODOT Highway Division, ODOT Rail Division, and the Port of Tillamook Bay Railroad. It is feasible that a second access for use only in emergencies would be permitted as a private crossing owned by the City of Bay City and the standards would be less than those for a full time access. A full time second access would have to meet the access and spacing standards of the current ODOT Highway Design Manual.

At minimum, the City of Bay City would like to install a second vehicular access for use in emergencies. However, after lengthy discussion, a suitable location for that access has not yet been determined.

Traffic Calming

When streets are safe and pleasant, the quality of life is enhanced. When traffic problems are a daily occurrence, they threaten our sense of community and personal well-being.

Traffic calming (also called traffic management) refers to various design features and strategies intended to reduce vehicle traffic speeds and volumes on a particular roadway. Traffic calming projects can range from minor modifications of an individual street such as the installation of a speed hump to comprehensive redesign of a road network such as the installation of a downtown streetscape. Some examples of traffic calming are provided in Figure 9. Additional discussion about traffic calming is provided in Technical Memorandum #2.

Traffic calming recommendations were the subject of conversation at the first town hall meeting and at the third Project Advisory Committee Meeting. Traffic calming recommendations for Downtown Bay City are provided in the Bay City Downtown Transportation Plan.

The Bay City Transportation Plan recommends the installation of the following traffic calming devices:

Proposed Improvement Projects

- Downtown Streetscape: When sidewalks are constructed in downtown Bay City, install curb extensions at the corners of street intersections to shorten the distance that pedestrians need to cross and create a narrower right of way calming traffic speeds. [This is a design recommendation from the Downtown TSP]
- Traffic Calming at 4th Street and A Street: Construct a speed hump with a marked walkway at 4th and A Street near the parking lot for the City Park.
- Traffic Calming at 5th Street and Hayes Oyster Drive: Construct chicanes at 5th Street and Hayes Oyster Drive, further refining the intersection that was recently completed at Center Market.
- Street Trees: Install street trees where appropriate for the right-of-way width and terrain such as in the Bay City Downtown.

Street Trees

Trees are long-term, solar-powered, multi-tasking solutions to environmental concerns facing today's modern cities. Street trees provide a variety of benefits, including: improving water quality by reducing erosion and runoff, providing shade for trail users and cooling of streams - improving fish habitats, improving the air by capturing pollution particles, reducing carbon dioxide and producing oxygen, providing food and shelter for wildlife, and reducing stress and crime levels in communities.

In addition to their aesthetic value, street trees can slow traffic and improve safety for pedestrians. Trees add visual interest to streets and narrow the street's visual corridor, which may cause drivers to slow down. The recommendations on street trees have considered maintenance, massing, fruiting, and other characteristics of the possible tree types. Though native trees were sought for the downtown, the best options that have been identified are non-native species. However, on the local street system, where a larger tree can be accommodated, native trees have been recommended.

Bicycle Parking

Cyclists' needs for bicycle parking range from simply a convenient piece of street furniture, to storage in a bicycle locker that affords weather, theft and vandalism protection, gear storage space, and 24-hour personal access. Most bicycles today cost $350 to over $2,000 and are one of the top stolen items in all communities, with components and accessories being stolen even when a bicycle is securely locked. Theft can be a serious deterrent to riding, especially for low-income riders or those with particularly expensive or rare bicycles.

Short-term bicycle facilities are intended to provide short-term bicycle parking, and include racks which permit the locking of the bicycle frame and one wheel to the rack and support the bicycle in a stable position without damage to wheels, frame, or components. Short-term bicycle parking is currently provided at no charge at most locations. Such facilities should continue to be free, as they provide minimal security, but encourage cycling and promote proper bicycle parking.

Long-term bicycle parking provides employees, students, residents, commuters and others who generally stay at a site for several hours, a secure and weather-protected place to park and store bicycles. Long-term facilities protect the entire bicycle, its components, and accessories against theft and inclement weather, including snow and wind-driven rain. Examples include lockers, check-in facilities, monitored parking, restricted access parking, and personal storage.

The Plan (with details in Technical Memo #3) includes recommended design standards for short and long term bicycle parking. The dimensions and standards meet or exceed those recommended by the Oregon Bicycle and Pedestrian Plan. These standards should be utilized during the design of the downtown streetscape and with future private development. Several cities and organizations have sponsored bike rack design competitions to develop functional sculptures that provide bicycle parking locations. It is recommended that Bay City partner with a nearby school to generate ideas for a local bike rack design.

Traffic Calming

Traffic calming interventions slow traffic by modifying the physical environment of a street. A variety of traffic calming measures are available.

- Traffic calming devices to improve pedestrian safety has shown that traffic calming can reduce the number of automobile collisions.
- Consultation with public works and public safety agencies (for example, fire and medical services) should occur prior to the installation of traffic calming improvements.

Chicanes

Chicanes form an S-shaped street which reduces vehicle speeds.

- Can also be achieved by establishing on-street parking on alternate sides of the street.
- Most effective on streets with narrower cross-sections.

Mini Traffic Circles

Mini traffic circles are raised or delineated islands placed at intersections, reducing vehicle speeds through tighter turning radii and narrowed vehicle travel lanes.

- Slow vehicle traffic while facilitating all turning movements at an intersection.
- Mini traffic circles can also include space for landscaping or art.
- A paved apron can be added to accommodate the turning radii of larger vehicles like fire trucks.

Choker Entrances

Choker entrances are intersection curb extensions or raised islands that visually or physically narrow the roadway.

- Have the effect of slowing traffic without necessarily narrowing lanes.
- Can also be designed to permit some vehicle turning movements from the street onto the cross-street while restricting other movements.

Speed Humps

Speed humps are rounded raised areas of the pavement requiring approaching motor vehicles to reduce speed.

- Discourage through travel on a street when a parallel through route exists.
- Four speed hump shapes—sinusoidal, circular, parabolic, and flat-topped—which differ in their slope shape.
- Speed humps are not recommended for emergency response routes or transit corridors.

Street Trees

In addition to their aesthetic value, street trees can slow traffic and improve safety for pedestrians. Trees add visual interest to streets and narrow the street's visual corridor which may cause drivers to slow down. Street trees should be appropriate for the desired streetscape and use.

Street trees provide a variety of benefits, including:

- Improving water quality of rivers and streams by reducing erosion and runoff.
- Providing shade for trail users and cooling of streams, improving fish habitats.
- Improving the air by capturing pollution particles, reducing carbon dioxide, and producing oxygen.
- Providing food and shelter for wildlife.
- Reducing stress and crime levels in communities.

Figure 9
Traffic Calming

Improvement Concept
Bay City, Oregon

Recommended Financing

The City faces significant funding challenges, having a history of minimal revenue generation. The City of Bay City will continue to seek equitable funding sources that are adequate to provide a safe and efficient transportation system. Funding resources for proposed improvement projects include the State Transportation Improvement Program (STIP), state and federal grant opportunities, and local revenue options. Options considered for future revenue generation in Bay City were focused on a system development charges (SDCs) and a road district.

Road districts may be created under Oregon Revised Statutes (ORS) 371.055 to 371.110 for the purpose of improving public roads within a city or drainage district. A road district can be superimposed over a part of a county as a means of levying a property tax for roads in addition to any overall county road levy. A road district would utilize a tax on real property, including undeveloped property. Members of the Project Advisory Committee recommended that a road district be established and allow for the current street maintenance fee to be discontinued.

Transportation SDCs are fees paid by land developers to cover a portion of the increased system capacity needed to accommodate new development. Development charges are calculated to include the costs of impacts on services, such as increased school enrollment, parks and recreation use, or traffic congestion. A Transportation SDC is a one-time fee charged to new development that helps pay the costs of building transportation infrastructure (for example, roads or sidewalks) to support the overall transportation system. The City of Bay City does not currently utilize any Transportation SDC financing mechanisms.

Funding resources and options are further described in Technical Memorandum #2. The methodology used to determine the figures used in Table 1 and Table 2 are provided in Technical Memorandum #3.

Table 1 shows the improvement projects that are feasible given the level of funding expected from the State, System Development Charges and contributions from new development, and other local sources over the next 20 years. The timing of each project may change as grant resources become available for different types of improvements. The "timing" column is intended to reflect the prioritization developed by the Transportation Plan, Project Advisory Committee. The estimated state share is based on the funding history of projects in Bay City and similarly jurisdictions in Oregon. The "estimated share from new growth" is based on an analysis of the proposed system development charge program which has not yet been adopted or implemented by the City.

TABLE 1. IMPROVEMENT PROJECTS (THROUGH 2030)

Project	Timing	Draft Cost Estimate	Estimated State Share	Estimated Share from New Growth	Estimated Local Share
Warren Street and US 101	Medium	$200,000	$60,000	$63,000	$77,000
Hayes Oyster Drive and US 101	Short	$2,000,000	$500,000	$450,000	$1,050,000
Downtown Streetscape	Short	$2,500,000	$125,000	$712,500	$1,662,500
McCoy Avenue and US 101	Medium	200,000	$40,000	$48,000	$112,000
Traffic Calming on Williams and 16th	Short	$9,000	0	$0	$9,000
Traffic Calming on 4th	Medium	$8,000	0	$0	$8,000
Traffic Calming at 5th and Hayes Oyster	Medium	$3,000	0	$0	$3,000
Pathway along Railroad	Long	$900,000	0	$270,000	$630,000
5th Street Intersection with US Highway 101	Short	N/A	100%	N/A	-0-
Total Costs		**$5,820,000**	**$725,000**	**$1,543,500**	**$3,551,500**

Table 2 shows additional projects that are considered to be advantageous but not feasible within the plan period. The categorization and prioritization of these projects was completed at town hall and stakeholder meetings in 2009.

These proposed improvements were designed to meet existing and future transportation needs for those who live, work, recreate, and travel through Bay City.

TABLE 2. ADDITIONAL PROPOSED IMPROVEMENT PROJECTS

Project	Notes
Pedestrian bridge at Hayes Oyster	Post 20-year
Pedestrian Bridge at Warren	Post 20-year
Pathways along Patterson and Jacoby Creeks	Considered as recreation projects, not in transportation refinement plan financially constrained plan
Upgrade of Urban Collectors (Tillamook, McCoy, Warren, and 5th)	Post 20-year

Summary

As directed by the Comprehensive Plan, the policies, objectives, and projects identified in this Transportation Plan will support future growth and development of Bay City. The Transportation Plan provides the policy foundation for Bay City decision makers, staff, advisory bodies, and citizens. The Transportation Plan should be considered in all decision-making processes regarding the transportation system.

The intent of this Executive Summary is to create a blueprint for transportation system investments needed to achieve the Bay City Transportation vision while accommodating the community's increased transportation demand. Many of Bay City's citizens participated in a comprehensive public involvement program during the development of the Transportation Plan and it reflects what the community said it wants and expects from the future transportation system. It also identifies the types and locations of needed investments and how future investments in the system should be prioritized.

Bay City Transportation Refinement Plan Technical Memorandum #1 - Conditions, Deficiencies, and Needs

Prepared for

City of Bay City
5525 B Street
P.O. Box 3309
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February 2009

CITATION

This project is partially funded by a grant from the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. This TGM grant is financed, in part, by federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), local government, and State of Oregon funds.

The contents of this document do not necessarily reflect views or policies of the State of Oregon.

Parametrix. 2009. Bay City Transportation Refinement Plan Technical Memorandum #1 - Conditions, Deficiencies, and Needs. Prepared by Parametrix, Portland, Oregon. February 2009.

CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

Prepared by Shelley Oylear and Derek Chisholm

Checked by Anne Sylvester and Brian Bierwagen

Approved by Brian Bierwagen

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

LIST OF TABLES

APPENDICES

ACRONYMS

ADA	Americans with Disabilities Act
ADAAG	ADA Accessibility Guidelines
ADT	Average Daily Traffic
ATR	Automated Traffic Recorder
CFR	Code of Federal Regulations
DLCD	(Oregon) Department of Land Conservation and Development
HDM	ODOT Highway Design Manual
HV	(30) HV refers to 30th highest hourly traffic volume
LOS	Level of Service
MEV	Million Entering Vehicles
MVMT	Million Vehicle Miles of Travel
MUTCD	Manual of Uniform Traffic Control Devices
NHS	National Highway System
OAR	Oregon Administrative Rules
OBPP	Oregon Bicycle and Pedestrian Plan
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
OTC	Oregon Transportation Commission
OTP	Oregon Transportation Plan
ORS	Oregon Revised Statues
PDO	Property Damage Only
PDX	Portland International Airport
Refinement Plan	City Transportation Refinement Plan
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SDC	System Development Charges
SPIS	Safety Priority Index System
STIP	State Transportation Improvement Program
Synchro	HCM compatible traffic analysis software for intersections
TCTD	Tillamook County Transportation District
TPAU	(ODOT) Transportation Planning and Analysis Unit
TPR	Transportation Planning Rule
TSP	Transportation System Plan
UGA	Urban Growth Area
UGB	Urban Growth Boundary
USDOT	United States Department of Transportation
V/C	Volume-to-Capacity (ratio)

1. INTRODUCTION

This report provides analysis of existing and future transportation conditions for the Bay City study area as a part of the analytical process for the City's Transportation Refinement Plan (Refinement Plan).

This report is divided into six chapters with Chapter 1 being this Introduction. Chapter 2 provides a summary of all applicable plans, policies, and programs relevant to the Transportation Refinement Plan, as well as a review of existing land use and demographics. Chapter 3 provides a review of the existing transportation system as it relates to all travel modes. Chapter 4 provides an operational analysis for study intersections within the project area for the base year of-2010, assuming that no significant transportation demand management or capacity-increasing investments occur within the study area. This analysis includes an evaluation of traffic volumes and operations, and an assessment of recent crash data. Chapter 5 discusses traffic operations at these same intersections in the planning horizon year of 2030. Chapter 6 summarizes transportation system needs and deficiencies.

1.1 PROJECT OBJECTIVES

The objectives of the Bay City Transportation Refinement Plan project are defined in the scope of work and the agreement signed between Bay City, the Oregon Department of Transportation (ODOT), and the Oregon Department of Land Conservation and Development (DLCD). These objectives include:

1) To identify development standards and improvements for safe intersections with US 101;
2) To identify specific street right-of-way development standards for streets within the city and urban growth boundary based on potential future land use;
3) To identify development standards and improvements that will effectively manage traffic speeds, increase connectivity and enhance safety for Bay City and the area within its urban growth boundary;
4) To provide ordinance amendments that will effectively enact the administration of identified development standards;
5) To provide written and graphic identification of development standards and improvements to a scale and quality suitable to submit applications to potential grant programs and funding agencies; and
6) To identify funding mechanisms including taxes, road maintenance district fees, traffic impact fees, and SDC fees suitable to implement development standards and improvements.

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2. BACKGROUND DATA AND DOCUMENTS

As an initial step in the planning process, the consultant team reviewed applicable City, County, and State plans and policies relevant to the transportation planning process. The purpose of this review was to provide a policy context for the planning effort, help ensure that proposed projects were consistent with existing relevant plans and policies, and aid in the development of implementing ordinances for the transportation plan. The consulting staff reviewed documents for the jurisdictions that own, regulate or provide public services on the transportation system in Bay City. These jurisdictions include Bay City, Tillamook County, the Tillamook County Transportation District (TCTD) and the State of Oregon. Some of these documents offer guidance for the refinement plan and provide information that is reported in this technical memorandum. Other reviewed documents had little bearing on the findings in this memorandum, but will be used in other tasks that are part of the development of the Refinement Plan.

2.1 PLANS AND POLICIES

The consulting team has completed a review of the applicable state and federal plans and programs, as well as numerous local plans, sets of standards, and other materials. The following documents were reviewed:

Federal

- Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005) (23 Code of Federal Regulations [CFR] 450 and 49 CFR 613)
- Federal Americans with Disabilities Act

State of Oregon/ODOT

- Transportation Planning Rule (Oregon Administrative Rule [OAR] 660-012)
- Oregon Transportation Plan (2006)
- Oregon Highway Plan (2006)
- Oregon Rail Freight and Passenger Plan (2001)
- Oregon Public Transportation Plan (1997)
- Oregon Bicycle and Pedestrian Plan (1995)
- Oregon Highway Design Manual
- Access Management Rules (OAR 734-051)
- Statewide Transportation Improvement Program 2008-2011
- Transportation System Planning Guidelines (2008)

Local

- Bay City Comprehensive Plan
- Bay City Downtown Transportation Plan
- Bay City Development Ordinance and Zoning Map
- Bay City Standard Details and Technical Specifications
- Geologic and Geotechnical Hazards Assessment: Bay City, Oregon
- Bay City Street Ordinance
- Bay City Tax Assessor Plat maps
- Bay City Aerial Photographs
- Bay City Local Wetland Inventory
- Bay City Stormwater Drainage Master Plan
- Emergency response plans including those for a tsunami

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was enacted in 2005. With guaranteed funding for highways, highway safety, and public transportation totaling $244.1 billion, SAFETEA-LU represents the largest surface transportation investment in U.S. history. The two landmark bills that brought surface transportation into the 21st century—the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21)—shaped the highway program to meet the nation's changing transportation needs. SAFETEA-LU builds on this firm foundation, supplying the funds and refining the programmatic framework for investments needed to maintain and grow vital transportation infrastructure.

SAFETEA-LU addresses the many challenges facing our transportation system today such as improving safety, reducing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment. It also lays the groundwork for addressing future challenges. SAFETEA-LU promotes more efficient and effective federal surface transportation programs by focusing on transportation issues of national significance, while giving state and local transportation decision makers more flexibility for solving transportation problems in their communities. SAFETEA-LU is implemented at the state level through the Oregon Transportation Plan (OTP).

Federal Americans with Disabilities Act

The Americans with Disabilities Act (ADA) prohibits state and local governments from discriminating against people with disabilities in all programs, services, and activities. Under the ADA, the U.S. Access Board has developed and continues to maintain design guidelines for accessible buildings and facilities known as the ADA Accessibility Guidelines (ADAAG). These guidelines were adopted by USDOT, published as the ADA Standards for Accessible Design, and enforceable under the ADA.

"The implementing regulations for Titles II and III of the ADA require curb ramps to be provided in all existing facilities and for new construction and alterations."[1] However, with the exception of curb ramps, accessibility standards have not yet been developed for sidewalks and trails.

Despite the current lack of enforceable standards, "public and private entities who design and construct sidewalks and trails are still obligated under ADA to make them accessible to and usable by people with disabilities. Until specific standards are adopted as part of ADAAG, some of the existing scoping and technical provisions for new construction and alterations can be applied to the design of pedestrian facilities, such as":[2]

- Accessible Routes (ADAAG 4.3)
- Curb Ramps (ADAAG 4.7)
- Ramps (ADAAG 4.8)

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[1] Federal Highway Administration, U.S. Department of Transportation. "Designing Sidewalks and Trails for Access, Part I of II: Review of Existing Guidelines and Practices" Barbara McMillen, Program Manager; Beneficial Designs, Inc. Author. Clay Butler, Illustrations. September 2001. http://www.fhwa.dot.gov/environment/sidewalk2/.

[2] Federal Highway Administration, U.S. Department of Transportation. Et al. September 2001.

Rights-of-Way Accessibility Guidelines

In addition to maintaining the ADAAG, the U.S. Access Board has published draft public rights-of-way accessibility guidelines. While these guidelines have not yet been adopted into the ADAAG, the Access Board recommends that where ADA standards don't include applicable provisions, the November 23, 2005 draft Public Rights-of-Way Accessibility Guidelines be referenced as a best practices manual.[3] The draft guidelines address the following:

- Pedestrian Access Route
- Alternate Circulation Path
- Curb Ramps and Blended Transitions
- Detectable Warning Surfaces
- Pedestrian Crossings
- Accessible Pedestrian Signals
- Street Furniture
- On-Street Parking
- Call Boxes

Oregon Transportation Planning Rule

Adopted by the Land Conservation and Development Commission in 1991, the Transportation Planning Rule (OAR Chapter 660, Division 12) represents an element of Oregon's Statewide Planning Goal #12 – Transportation. The Transportation Planning Rule (TPR) interprets OTP policies. The goal of the TPR is to promote the development of safe, convenient and economic transportation systems designed to reduce reliance on the automobile so that air pollution, traffic and other livability problems faced by urban areas and other parts of the country might be avoided. The TPR requires each City and County to adopt a Transportation System Plan (TSP) and implementing regulations, and also outlines specific items that must be addressed in the TSP. The TPR requires that TSPs accommodate all travel modes in use within the city, be consistent with the larger programs contained in the OTP, and be coordinated with federal, state, and local agencies. The TPR requires every TSP's to assess existing facilities for their adequacy and deficiencies; develop and evaluate system alternatives needed to accommodate land uses in the acknowledged comprehensive plan; and adopt local land use regulations to support implementation of the preferred alternative.

Oregon Transportation Plan (2006)

The Oregon Department of Transportation (ODOT) utilizes several planning documents to guide transportation planning efforts and transportation system improvements in the state. The OTP is ODOT's overall policy guiding document. The OTP and its modal elements represent a statewide TSP and drive all transportation planning in Oregon. The plans provide a framework for cooperation between the ODOT and local jurisdictions and offer guidance to Cities and Counties for developing local modal plans. Table 2-1 lists established modal plans and the year each plan was adopted by the Oregon Transportation Commission (OTC).

[3] Available at: http://www.access-board.gov/prowac/draft.htm.

Table 2-1. Adopted Elements of the Oregon Transportation Plan

Oregon Transportation Plan or Plan Element	Year Adopted
Aviation System Plan	2000
Bicycle and Pedestrian Plan	1995
Transportation Safety Action Plan	1995
Public Transportation Plan	1997
Highway Plan	1999 with subsequent amendments
Rail Freight and Passenger Plan	2001

First adopted in September 1992, the OTP has three elements: (1) Goals and Policies; (2) Transportation System; and (3) Implementation. The OTP meets a legal requirement that the OTC develop and maintain a plan for a multimodal transportation system for Oregon. Further, the OTP implements the Federal Safe Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU, 2005) requirements for the state transportation plan. The OTP also meets land use and transportation planning requirements for state agency coordination, and serves as the implementing policy element of Statewide Goal 12, "Transportation". Goal 12 requires Oregon jurisdictions to cooperatively plan and develop balanced transportation systems.

Oregon Highway Plan (1999 – with subsequent amendments)

This plan defines policies and investment strategies for Oregon's state highways for the next 20 years. It further refines the goals and policies of the OTP and is a key component of the OTP. The Oregon Highway Plan (OHP) has three main elements:

- The Vision presents a vision for the future of the state highway system; describes economic and demographic trends in Oregon and future transportation technologies; summarizes the policy and legal context of the OHP; and contains information on the current highway system.
- The Policy Element contains goals, policies, and actions in five policy areas: system definition, system management, access management, travel alternatives, and environmental and scenic resources.
- The System Element contains an analysis of state highway needs, revenue forecasts, a description of investment strategies, an implementation strategy, and performance measures.

The OHP gives policy and investment direction to corridor plans and transportation system plans that are being prepared around the state, but leaves the responsibility for identifying specific projects and modal alternatives to these plans.

Oregon Rail Plan (2001)

This plan presents an overview of the rail system in Oregon. It outlines the state rail planning process and examines specific rail lines in detail that may be eligible for state or federal financial assistance. The plan examines the trend of service on low-density rail lines increasingly provided by the short haul (Class III) railroads. In addition, the plan describes minimum level of service standards for freight and passenger rail systems in Oregon. The previously adopted Passenger Policy and Plan (1994) is now a component of the Oregon Rail Freight and Passenger Plan.

The Port of Tillamook Bay Railroad runs through Bay City. The line was originally built by Pacific Railway and Navigation. More information on the railway is provided in subsequent sections of this memorandum.

Oregon Public Transportation Plan (1997)

The plan is primarily focused on public transportation in metropolitan and urban areas. In Policy 2a – Urban, small city, and rural public transportation systems, there is a call for the system in Bay City to "at a minimum" serve the transportation disadvantaged. Formal rideshare services and programs as well as fixed route service are expected in communities of 10,000 and more.

Oregon Bicycle and Pedestrian Plan (1995)

The Oregon Bicycle and Pedestrian Plan (OBPP) set forth the standards and guidelines for bikeways, walkways, and other pedestrian facilities, including crossing treatments that should be followed within the state of Oregon. This Plan is divided into two sections. Section One: Policy & Action provides background information and addresses the goals, actions, and implementation strategies ODOT proposes to improve bicycle and pedestrian transportation. Section Two: Bikeway & Walkway Planning, Design, Maintenance & Safety, provides guidelines to ODOT, cities and counties in designing, constructing and maintaining pedestrian and bicycle facilities. The OBPP is often used by local governments as a guide for the planning and design of facilities for these travel modes.

Oregon Highway Design Manual

The ODOT Highway Design Manual (HDM) establishes policies, processes, procedures and design standards/guidelines for transportation projects. The HDM adopts the AASHTO's "*A Policy on Geometric Design of Highway and Streets-2001*" and previous design guides to provide designers with background information to assist in applying the proper standards. Chapters on design are broken down into specific design areas such as:

- Right of Way
- Rural –Non-Freeway Highway Design
- Urban Highway Design
- Intersection and Interchange Design
- Special Design Elements
- Bicycle and Pedestrian

Some projects under ODOT roadway jurisdiction traverse across local agency boundaries. Although the appropriate ODOT design standards are to be applied on ODOT roadway facilities, some local agencies have adopted design standards and guidelines that differ from various ODOT design standards. The HDM recommends designers be aware of the local agency publications, design practices, as additional guidance for concepts and strategies for project design.

Oregon Administrative Rules Regarding Access Management

ODOT manages access to the highway facilities of the state to the degree necessary to maintain functional use, highway safety, and the preservation of public investment consistent with the 1999 OHP and adopted local comprehensive plans. The purpose of Oregon's Access

Management Rules is to govern the issuing of construction, operation, maintenance and use permits for approaches onto state highways, state highway rights-of-way and properties under the state's jurisdiction. These rules also govern closure of existing approaches, spacing standards, medians, variances to the standards, appeal processes, and grants of access.

Through these rules, the state indicates its policy to manage the location, spacing and type of road and street intersections and approaches on state highways to assure the safe and efficient operation consistent with their classification, and the designation of the particular highway segment. OAR 734-051 contains policies and standards regulating access, and generally holds that access control should be considered where beneficial, such as when:

- Protecting resource lands,
- Preserving highway capacity on land adjacent to an urban growth boundary, or
- Ensuring safety on segments with sharp curves, steep grades or restricted sight distance or those with a history of accidents.

Legal and policy guidelines for access are also covered in the Oregon Revised Statues (ORS 374), the OHP, and the OTP. Oregon's access management rules and standards apply to US 101.

Statewide Transportation Improvement Program 2008-2011

Oregon's State Transportation Improvement Program (STIP) is the state's transportation capital improvement program, which fulfills the requirements of the federal Safe, Accountable, Flexible, Efficient, and Transportation Equity Act: a Legacy for Users (SAFETEA-LU, 2005). The STIP lists the schedule of transportation projects for the four-year period from 2008 to 2011. It is a compilation of projects utilizing various federal and state funding programs, and includes projects on the State, County and City transportation systems as well as projects in the National Parks, National Forests, and Indian Reservations.

The STIP is not a planning document; it is a project prioritization and scheduling document developed through various planning processes involving local and regional governments, transportation agencies, and the interested public. Through the STIP, ODOT allocates resources to those projects that have been given the highest priority in these plans. There are only three projects listed in the Plan for US 101 within Tillamook County. None of these projects are likely to have an impact in Bay City. The list includes:

- A realignment and Fish passage improvement from Manzanita Avenue to Neahkahnie Creek (project 11258),
- Protective Rock Screens near Neahkahnie Chasm (project 14786), and
- Bridge rehabilitation for the Three Rivers (Hebo) bridge (project 14808).

Bay City Comprehensive Plan

The Comprehensive Plan, adopted in 1978 and amended through 2007 generally supports a quiet residential nature for Bay City. New development, it is recommended, will be limited. The plan also speaks to a high quality of life, natural resource protection, and other items typical to a Comprehensive Planning in Oregon.

There is select reference to transportation system planning such as the examples provided below:

GOAL I: TO MAINTAIN A HIGH QUALITY OF LIFE IN KEEPING WITH THE NATURAL ENVIRONMENT.

POLICIES:

1. The Plan and City ordinances shall promote development that complements and protects the Bay City environment.

GOAL II: TO ENCOURAGE A CITY FORM WHICH IS COMPACT, EFFICIENT, AND ATTRACTIVE.

POLICIES:

1. Public facilities and services such as sewer, water, and fire protection, shall be extended in an orderly, efficient fashion.

4. Commercial land use shall be directed toward the town center, rather than toward highway commercial types of use.

GOAL VI: TO PROVIDE RECREATION OPPORTUNITIES FOR TOWNSPEOPLE AND VISITORS AND PROTECT THE OPEN SPACE AND UNIQUE AREAS OF THE CITY.

1. The City, within its financial capabilities, shall provide diverse recreational activities within the community for its residents and its visitors.

GOALVIII: TO PROVIDE A WIDE VARIETY OF HOUSING OPPORTUNITIES IN BAY CITY.

2. The minimum size building lot for new developments shall be 10,000 square feet, except that existing platted areas with 5,000 square foot lots may be developed for single family residences. Areas of unbuildable land (significant wetlands, slopes greater than 25%), shall not be used for density calculations.

Additional Policies (which follows the section on Goal VIII)

Bicycles:

1. The Oregon Coast Bicycle Route passes through the City on US 101. Development along the route or changes to the Highway should be compatible with its use by bicyclists.

2. The Street Section of the Public Facilities Plan generally does not require sidewalks as part of street improvements. However, as traffic becomes heavier along City arterials and in the commercial areas, consideration should be given to the requirement of sidewalks. Sidewalks would be built as part of new public or private street or land development.

GOAL IX: TO DEVELOP A CITIZEN INVOLVEMENT PROGRAM THAT INSURES THE OPPORTUNITY FOR CITIZENS TO BE INVOLVED IN ALL PHASES OF THE PLANNING PROCESS.

STORM DRAINAGE POLICIES:

1. Adequate storm drainage facilities, including culverts, catch basins, natural, surface or subsurface channel systems (approved by the Public Works Superintendent) shall be part of all development which is subject to the Planning Commission review.

2. Subdivision of areas that have drainage problems shall have adequate provision for storm runoff. This may be accomplished by larger lot sizes, mechanical means, maximum lot coverage requirements, or other methods approved by the City Engineer.

3. Natural drainage ways shall be maintained and protected from filling or other alteration. Wetlands should be used wherever possible for stormwater retention, and enhancement of water quality.

5. The City should evaluate storm drainage needs during its yearly budgeting process and provide funds for improvement of the system, if funds are available.

6. Storm drainage or runoff from new commercial developments, particularly those which have large parking lots or service stations, shall have catch basins or other treatment facilities for oil, grease drippings, or other contaminants. Where possible, parking areas should be porous.

8. The City should seek funding for an engineering study and recommendation as to an overall storm drainage plan within the City.

9. The City should adopt policies whereby the abutting property owner should be responsible for maintenance of any storm drainage ways and facilities which may be located on their respective properties or on a public way abutting their respective properties.

10. The City should review each street vacation request for possible use by the City for storm drainage prior to granting any vacation request.

STREET POLICIES:

1. The City shall continue to endorse the County's efforts in maintaining arterial roads through the area. It is the policy of the City that as long as these roads have regional significance beyond the City limits, and therefore benefit county residents in the general area, the County Road Department should be responsible for maintaining them.

2. The City Street Standards shall apply to all proposed subdivisions of land, planned developments, and major street improvements (beyond routine maintenance) sponsored by the City, County, or adjacent property owners. In order to vary from these standards, the party proposing the street or road improvement should show to the satisfaction of the City Council why a lesser improvement is adequate based on topography or other unusual circumstances.

3. Construction of streets in new partitions subdivision, planned unit developments, and rights-of-way where no street existed previously shall be the responsibility of the adjacent property owners, except where the street is an arterial or feeder.

6. In new developments, the City shall not accept streets into the City system until they are in conformance with City standards and all utilities are installed which would require future street excavation.

7. Efforts should be made to build streets and roads to conform to the natural contours of the land; where road cuts are necessary, they should be made so as not to cause future soil slippage or other geologic problems.

8. Wherever possible, new streets should avoid using active farm or timber lands.

The Comprehensive Plan also frames the development system for the City and provides the zones and structure which are implemented with specific ordinances. The framework of the land use system inn Bay City will be described in the following section of this memorandum.

Bay City Vision Plan

A process was started in 2000 to develop a new Vision for the city. In 2002, this Vision was completed and reported as the Bay City Vision Plan. The Vision called for a healthy downtown with significantly improved public spaces (streets, sidewalks, etc). The Vision also called for trails to be developed throughout the city. The trails are to connect the waterfront to the rest of the city, and two crossings for US 101. It showed one crossing as an elevated pedestrian bridge at Hayes Oyster Road.

The following provides an example of the goal set forth in the Vision:

GOAL I: TO IMPROVE TRANSPORTATION FACILITIES TO MEET THE OBJECTIVES OF THE 2002 BAY CITY VISION PLAN.

Objectives:

- Plan for sidewalks in downtown, along with crosswalks, curb extensions, and signage, for safe and pleasant pedestrian travel.
- Provide an urban trail system throughout Bay City, connecting downtown, residences and marina facilities.
- Improve on- and off-street parking opportunities for residential, business and recreational destinations.

Pavement Conditions

A map titled "Save Our Streets" was published on April 5, 2002, as part of the City's efforts toward road maintenance and rehabilitation. The map identifies and prioritizes streets in most need of pavement and related improvements. These maintenance and rehabilitation needs will be factored into later phases of this project, when system improvements are identified and prioritized.

The Bay City web page provides a more updated version of the City's list of improvement projects. The list includes: NEW LIST OF WEB

- Main Street (9th Street to 11th Street)
- Trade Street (2nd Street to westerly termination)
- 7th Street (Portland Avenue to Seattle Street)
- Main Street (4th Street to 5th Street)
- Main Street (4th Street to westerly termination)
- 9th Street (Main Street to Pacific Street)
- Spruce Street (Warren Street to Hare Street)

Bay City Development Ordinance

The applicable elements of the development ordinance was adopted in 1978, and amended through September 2008. The development ordinance will be discussed in detail as recommended amendments are provided in subsequent memoranda. The excerpts below will either guide the development of alterative solutions for Bay City's transportation deficiencies or will be edited as alternative code language may better integrate land use and transportation planning in Bay City. Numerous sections will require revisions, as they have applicability to "Arterial" roadways, which are changing in definition from previous plans. The specific

parking requirements highlighted below may be determined to be high, and recommended for reduction. Other identified sections of the Development Ordinance may require amendment to facilitate the development of a small, walkable downtown.

Article 1

Introductory Provisions and Intensity Zones

High Intensity Zones:

Section 1.413 Maximum Height

Maximum of 24 feet, except that the Planning Commission may allow up to 30 feet if 1) views of adjacent properties are not blocked; 2) the structure would not block views from a public street or highway; 3) the structure would not dominate adjacent structures or the neighborhood; and 4) there is a design purpose for the greater height such as solar exposure, maintenance of trees, or view potential.

Section 1.408 Minimum Open Area

a. Residential Uses: 50%

b. Commercial, Industrial, or Other Non-residential Uses: 25%

Section 2.207 Commercial Uses - High Traffic Generation

a. Commercial uses requiring large land area or capable of generating high traffic volumes include auto service stations, car lots, lumber yards, manufactured dwelling sales, or large retail outlets.

b. Uses shall be located on an arterial street, or at the intersection of two collector streets in order to lessen traffic impacts on residential areas. Access shall be designed to provide ingress or egress on non-residential streets.

Section 2.215 General Conditional Use Standards

The following conditional use standards shall apply to all activities listed in the Use Matrix as a conditional use:

a. Traffic Generation Standards

1) Uses with high traffic generation, as determined by the Planning Commission using acceptable traffic generation documents, shall be located in the high intensity areas of the city or within 100 feet of the intersection of two arterial streets.

2) Uses which would generate moderately greater traffic volumes than residential uses occupying the same land area at allowable densities shall be located on arterial streets.

3) Uses which would generate no more traffic than a residential use occupying the same land area at allowable density levels (calculated without bonus density) may be located on residential or collector streets.

4) Uses locating in the vicinity of US 101 shall have their access onto public streets other than US 101 in order to limit access points along the main highway. New access points may be allowed onto US 101 only where no alternative exists, as determined by the Planning Commission, and with the prior approval of the State Highway Division.

Section 3.3 Setback Requirements

Section 3.302 Without Planning Commission Review

Setbacks from lot lines shall be 20 feet in a front yard, 10 feet in a rear yard and 5 feet in a side yard. In the case of a yard abutting a street, with the exception of the front yard, the street yard setback shall be 15 feet and the rear yard setback, with the exception of a rear yard abutting a street, may be reduced to 5 feet. Side yard requirements do not apply to the common property line separating zero lot line development developed in accordance with the zero lot line setback provisions in

Section 3.5 Parking Standards

Hotel/Motel: 1.25 per unit

Eating/Drinking Establishment: 1 per 200 square feet gross floor area

Auditoriums with fixed seating: 1 per three seats

Section 3.9 Street Lights or Security Lights

a. Street lights shall be the minimum necessary wattage to illuminate a specific area, such as an intersection, and shall be at least 200 feet apart.

b. Street lights, security lights, flood lights or spot lights shall be shielded so as not to cast glare on adjacent property.

Section 3.96 Architectural Review

Applications for the construction of new commercial, industrial, or the substantial renovation of existing commercial structures (over 50% market value) shall be reviewed by the Planning Commission to ensure that:

a. Design is compatible with the downtown area in terms of height, scale, and use of materials and colors.

b. Particular attention is given to the impact of proposed structures on historic buildings, such as the Methodist Church, Masonic Temple, and the Simmons' houses.

c. Styles characteristic of the coastal area are used, including the use of natural wood siding, pitched roofs, and wood signs.

d. A landscaping plan shall be submitted which shows existing and proposed trees, landscaping materials, and other features, in order to permit the Planning Commission to review the plan.

e. Parking, loading and storage areas shall be located in the rear of buildings wherever possible, unless it would conflict with adjoining residential uses. Landscaping shall be used to buffer commercial uses.

Bay City Downtown Transportation Plan

A previous TGM grant was awarded to the City for the completion of a Downtown Transportation Plan. The Plan was completed in 2003 but was not adopted. The findings and recommendations in this plan will be incorporated into the Refinement Plan.

Recommendations from the Downtown Transportation Plan included the following new polices, street cross sections, gateways and more:

Recommended Revision to Comprehensive Plan Policy 2

Sidewalks and Bicycles:

2. The Street Section of the Public Facilities Plan generally does not require sidewalks as part of street improvements. However, as traffic becomes heavier along city arterials and in the commercial areas, consideration should be given to the requirement of sidewalks. Sidewalks would be built as part of new public or private street or land development. Sidewalks have been included in all street cross section options developed as part of the City's Downtown Transportation Plan. These cross sections have been adopted by the City are found within the Street and Storm Drainage System Design Standards.

Recommended Comprehensive Plan Policy 3.

The City's Downtown Transportation Plan includes street cross sections with bicycle lanes for street cross sections for 5th Street and C Street. Illustration of these cross sections is found in the Street and Storm Drainage System Design Standards. These cross sections have been adopted by the City and are found within the Street and Storm Drainage System Design Standards.

The Plan developed recommended changes to the STREET POLICIES as well:

2. The City Street Standards as listed in the Street and Storm Drainage System Design Standards shall apply to all proposed subdivisions of land, planned developments, and major street improvements (beyond routine maintenance) sponsored by the City, County or adjacent property owners. In order to vary from these standards, the party proposing the street or road improvements should show to the satisfaction of the City Council why a lesser improvement is adequate based on topography or other unusual circumstances.

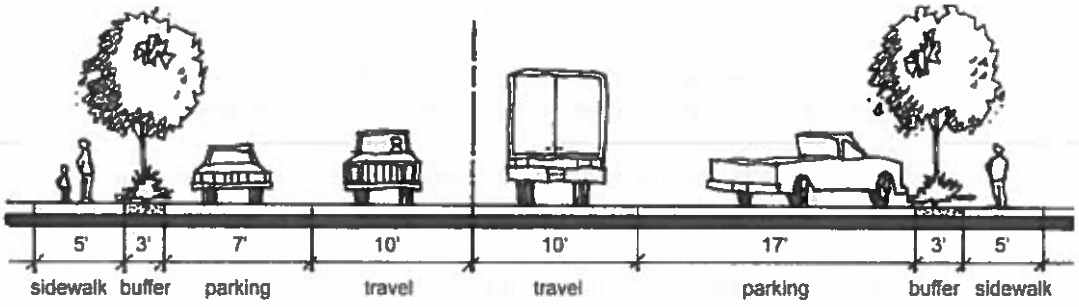
9. The City will consider future development of an off-street trail along Patterson Creek and development of a gateway concept for the entrance to Bay City as described in the Bay City Downtown Transportation Plan, Section 4, Preferred Alternatives.

10. The City will work to incorporate (as resources allow) streetscape elements for pedestrian and bicycle friendly street design as illustrated in the Downtown Transportation Plan (see cross-sections following).

The Downtown transportation Plan also called for many revisions to the Bay City Street and Storm Drainage System Design Standards. These will be incorporated into the changes recommended by this Refinement Plan. The following cross sections will also be incorporated into the Refinement Plan.

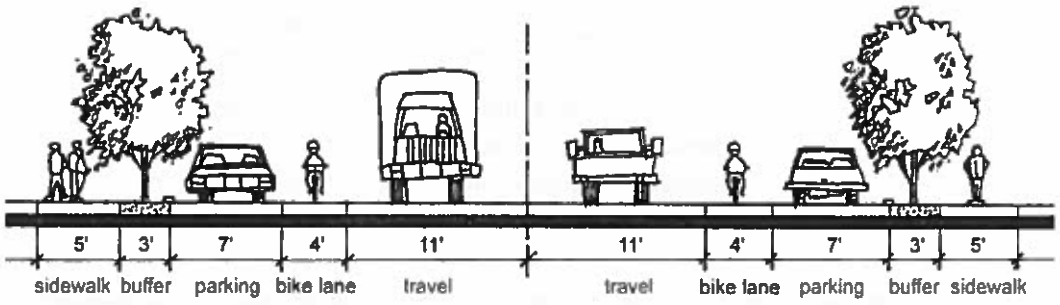
4th Street, A Street and B Street

Drawing No. R-122BC



Typical 5th Street and C Street Cross Section

Drawing No. R-123BC



Bay City Storm Drainage Master Plan

In 2003, the City of Bay City completed a Storm Drainage Master Plan. The Storm Drainage Master Plan called for the development and implementation of a Storm Water Management Ordinance, and provided guidance which will be incorporated into the development of transportation alternatives (both improvement projects and code changes). Chapter 4 of the Storm Drainage Master Plan identifies existing problems and proposed solutions. The Storm Drainage Master Plan concludes that the City of Bay City does not have a storm water hydraulic capacity problem, but does have a need for a maintenance plan for the upkeep of the existing storm drainage structures. The Storm Drainage Master Plan does provide some best management practices, and the recommendations applicable to this Refinement Plan include the following.

Landscape Planting

The Storm Drainage Master Plan recommends that landscaping utilize water-efficient, low maintenance plants. Such criteria will drive the later selection of street trees for the downtown.

Roadside and Perimeter Vegetated Swales

This practice requires that site planning and design respect the natural drainage patterns in lieu of elaborate underground, piped, storm drain systems. The Storm Drainage Master Plan suggests that vegetated swales are most applicable in residential areas of moderate density. Vegetated swales are considered as a method of biofiltration using terrestrial grasses and other fine herbaceous plants for storm water treatment. Such swales will also be considered during the later recommendation of code and policy amendments. The Storm Drainage Master Plan suggests that the following construction features can help to maximize the success in establishing swales as biofilters:

1. Sited or located away from building and tree shadows to avoid poor plant growth from lack of sunlight.

2. If the longitudinal slope is less than 2% or the water table can reach the root zone of vegetation, water tolerant species should be planted.

3. As much as practicable, the lateral slope is entirely uniform to avoid any tendency for the flow to channelize.

4. Entrance flow is dissipated quickly and flow distributed uniformly to avoid erosion.

5. The following grass mixture applied at a rate of 130 to 175 lbs/acre, dependent on detained runoff volumes, is recommended:

Species/Variety	lbs./1000 sq. ft.
Perennial Rye/ Edge	0.45 to 0.60
Kentucky bluegrass/Ram	0.45 to 0.60
Kentucky bluegrass/Meri	0.45 to 0.60
Chewings fescue/SR510	0.90 to 1.20
Hard fescue/SR3100	0.75 to 1.00

The Storm Drainage Master Plan cites as an effective example the vegetated perimeter swale in at the Tillamook Country Smoker. "The entire Northwest parking lot (approximately 66 vehicles) is sloped to drain with sheet flow over a grassy perimeter swale prior to entering the Unnamed Creek (Perkins Creek). A close examination of the perimeter swale indicates that sediments and oils that run off of the parking lot are being effectively trapped in the perimeter swale that is a mowed grassy surface".

Ordinance No. 577 Establishing a Systems Development Charge

This ordinance establishes a systems development charge, a methodology for calculating the charge, and appeals provisions. The purpose of the system development charge is to impose a portion of the cost of capital improvements for water, wastewater drainage, streets, flood control, and parks upon those developments that create the need for, or increase the demands on, capital improvements. Technical Memorandum #2 will address how this ordinance can be improved so as to better support the financing of necessary transportation improvements.

2.2 LAND USE AND DEMOGRAPHIC DATA

Land Uses

The City of Bay City is rather small, with a population of approximately 1,149 reported in the 2000 Census[4]. The 2000 Census numbers also provide the following data that will be utilized in the assessment of transportation needs in Bay City. Data presented below (Table 2-2) regarding disabilities and commute choices may be used to determine needs for multi-modal improvements and codified accommodations.

Table 2-2. Population and Demographics in Bay City

	Bay City		Tillamook County		State of Oregon	
Population (2000)		1149		24,262		3,421,399
Households		578		10,200		1,333,723
Population under 5	58	5%	1164	5%	223005	7%
Population Ages 5-20	210	18%	4978	21%	769046	23%
Population Age 21-64	661	57%	13323	55%	1991171	58%
Population Age 65+	220	19%	4797	20%	438177	13%
Percent of Households with a vehicle		97.4		94.20%		92.50%
Commute to work, Drive alone		73.10%		70.80%		73.20%
Commute to Work, Carpool		15.10%		14.90%		12.20%
Commute to Work, other means		2.40%		2.40%		6.10%
Work from Home		7.10%		6.50%		5.00%
Walk		2.20%		5.40%		3.60%
Percent Disabled (Age 5-20)		5.80%		9.10%		6.30%
Percent Disabled (Age 21-64)		25.40%		24.40%		18%
Percent Disabled (Age 65+)		37.70%		40.60%		41.50%

The Comprehensive Plan for Bay City is very informative. The Comprehensive Plan (and its implementing strategies as employed by the Planning Commission, City Council and City staff) all point toward a low-growth future for the city. The Comprehensive Plan also makes clear that while future development will occur on both the east and west sides of Highway 101, the City does not intend development to be focused around the highway. Rather, the city's cultural and commercial core is to be in the downtown, just east of the highway, and not oriented toward the highway (Figure 2-2). **GOAL III** of the Comprehensive Plan is to "Maintain the Quiet Residential Nature of Bay City." The Plan's **GOAL VIII** is to "Provide a Wide Variety of Housing Opportunities in Bay City."

Policies under this goal introduce the planned densities of the city which are later explained in detail as part of the Intensity Zones utilized in the Development Ordinance (Bay City Ordinance 374). Housing Policy 2 states that "The minimum size building lot for new

4 U.S. Census. 2000. United States Census 2000. U.S. Department of Commerce, Bureau of the Census. Washington, D.C.

developments shall be 10,000 square feet, except that existing platted areas with 5,000 square foot lots may be developed for single family residences. Areas of unbuildable land (significant wetlands, slopes greater than 25%), shall not be used for density calculations'. Larger lot sizes or lower densities may be required in the Low Intensity Zone, or in unplatted areas of the City."

The land use element of the Bay City Comprehensive Plan establishes five broad categories or zones of land and water use with the city. These are:

1. High Intensity
2. Moderate Intensity
3. Low Intensity
4. Coastal Shorelands
5. Estuarine Areas

Goals and policies of the Comprehensive Plan apply to the entire city, including all of the land use categories. The land uses which are allowed in each category are subject to the goals and policies in the rest of the Comprehensive Plan. The categories allow for a better mixing of uses than most conventional zoning systems that identify uses by zones such as "industrial, commercial, park, and residential". However, plan policies, case precedent, market conditions, and other mechanisms have contributed to a somewhat conventional division of uses. The city is geographically small and so, industrial, residential, and commercial uses are near to one another. But the uses are somewhat segregated. The exception will be the future downtown of Bay City which is envisioned as having commercial and residential uses together.

Land Use Categories:

High Intensity

The High Intensity category is where most intensive uses are carried out, such as commercial retail, wholesale, service, governmental, commercial recreation, high intensity residential, and light manufacturing. Some of these uses are also allowed in the Moderate Intensity and Low Intensity categories, but are generally encouraged, through less strict standards, in the High Intensity category. Residential density in the High Intensity Zone shall range from 8 to 12 dwellings per net acre.

The Town Center area is the central commercial portion of the city. The uses here are intended to be those which are important to the daily life of the city grocery stores, the post office, cafes, a tavern, shops, the City Hall, the park, church, and meeting halls. This is considered a good location for apartments, especially for elderly persons who could walk to the activities mentioned above.

Standards of community design in this area should promote compact, land intensive uses, such that people can park their cars in one place and walk to several shops or locations. As the community grows, a well designed and located parking lot could be necessary to maintain this town center concept.

Moderate Intensity Zone

The purpose of this category is to designate a large area of mostly platted (subdivided) land within the city limits. The largest land use is residential, with a few scattered pastures and other uses.

It is the intention of the Plan that the moderate intensity area develop at moderate density residential levels, at 4-8 dwelling units per acre. These can develop on a lot by lot basis, on 10,000 square foot lots, or 5,000 square foot lots if the site was platted prior to the adoption of the City zoning ordinance requiring 10,000 square foot minimum lot area.

Low Intensity Zone

The purpose of this category is to identify the lands within the Urban Service Area which are less developable due to their physical limitations (flooding, slope, etc.), their distance from city services such as sewer and water, or their present use for agricultural purposes. This area constitutes the "phased growth" portion of Bay City; as vacant lands in the moderate intensity areas become developed, it is anticipated that these areas will become more built up, subject to their physical limitations.

The residential density of this area shall range from one to four dwelling units per acre, depending on the building suitability and whether the lots or dwellings are clustered. Standards should be detailed in the Development Ordinance establishing specific lot sizes and building criteria.

In order to design the Refinement Plan recommendations, the project team has developed a map of projected land use changes for the 20 year planning period. The projections include the development of a small mixed use downtown that is thought to include:

- A Bank or Credit Union,
- Two new restaurants,
- Five new small businesses,
- A small motel on US 101, and
- And ten, new townhomes to be integrated with small scale mixed use developments.

The projections also include the addition of approximately ten residential units per year, spread somewhat evenly across the city. Figure 2-1 shows the projected growth in commercial services and new residential units in the Bay City Urban Growth Area.

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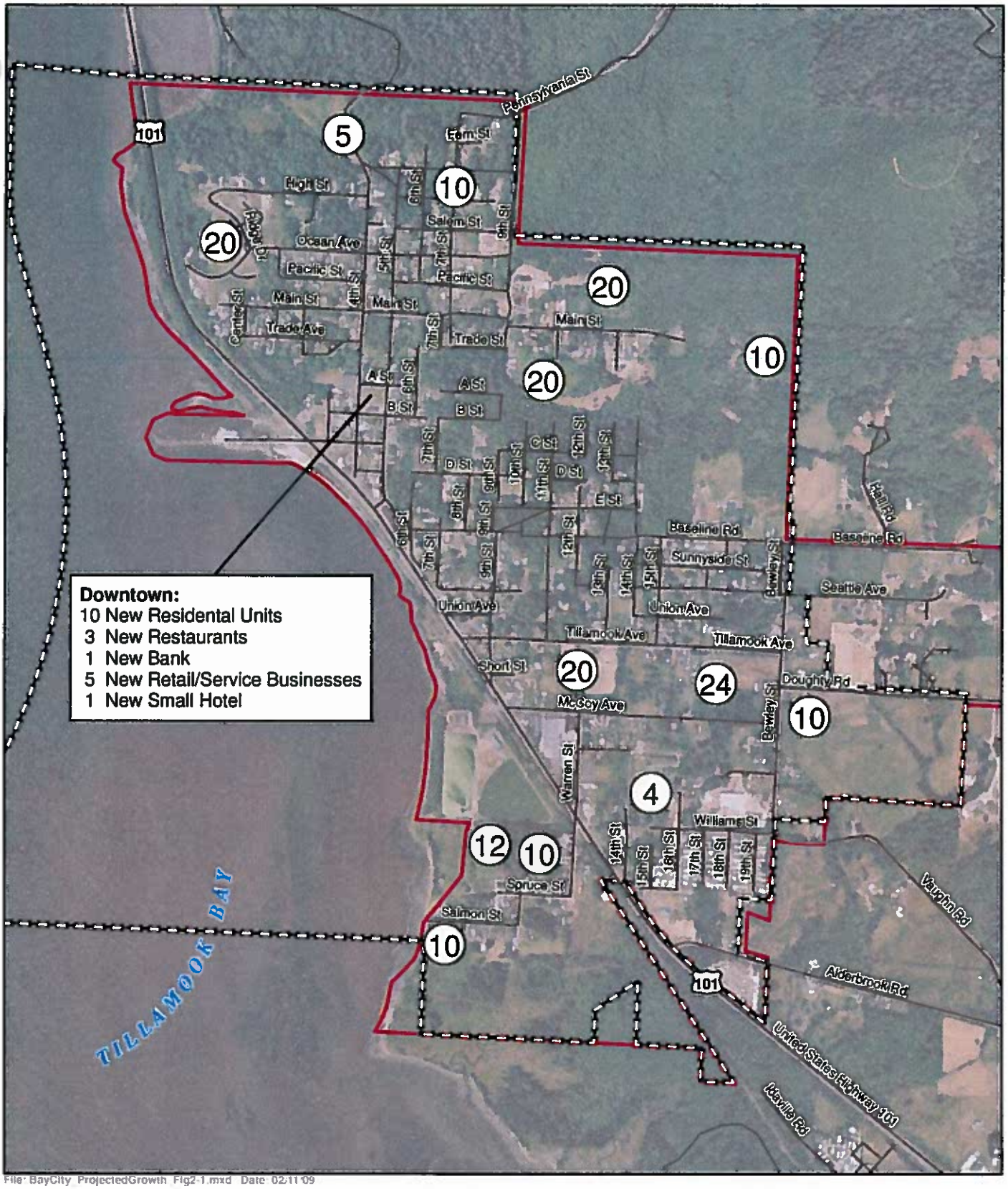

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Figure 2-1.
Projected Population Growth

Transportation Refinement Plan
Bay City, Oregon

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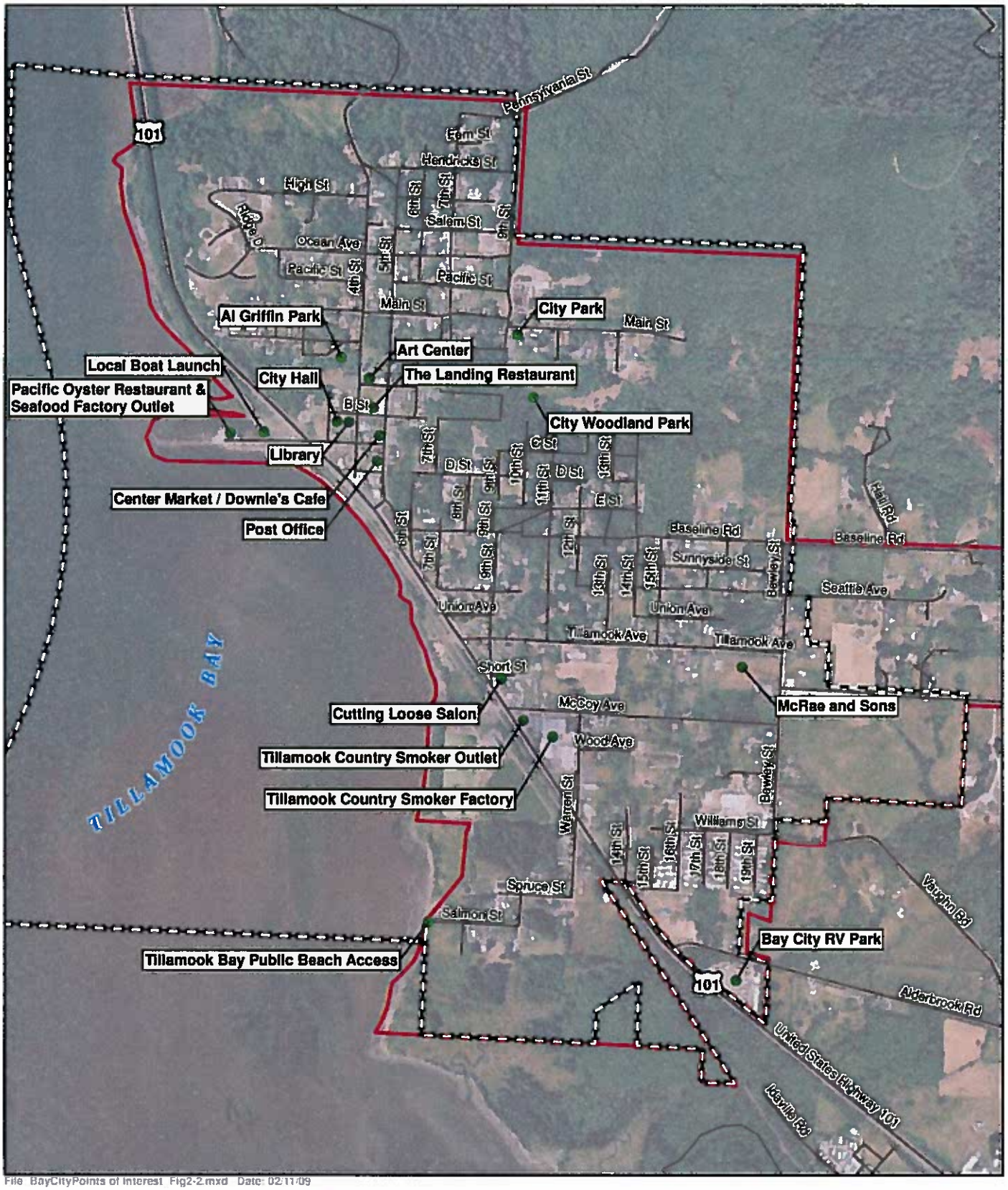

File BayCityPoints of Interest Fig2-2.mxd Date: 02/11/09

N

0 500 1,000 1,500

Scale in Feet

- Points of Interest
- Paved Roadway
- City Limit
- UGB

Figure 2-2
Points of Interest

Transportation Refinement Plan
Bay City, Oregon

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3. INVENTORY OF EXISTING CONDITIONS

3.1 OVERVIEW

This section will provide an overview of the existing land use and transportation system, policies, and implementing regulations.

3.2 EXISTING STREET SYSTEM

This section describes the physical characteristics of the street and highway system in the Bay City urban area.

Functional Classification of Transportation Facilities

Functional classification provides a systematic basis for determining future right-of-way and improvement needs, and can also be used to provide general guidance on appropriate or desired vehicular street design characteristics. The functional classification of a street is typically based on the relative priority of traffic mobility and access functions that are served by the street. At one end of the spectrum of mobility and access are freeways, which emphasize moving high volumes of traffic, allowing only highly controlled access points. At the other end of the spectrum are residential cul-de-sac streets, which provide access only to parcels with direct frontage and allow no through traffic. Between the ends of this spectrum are state highways, arterials, collectors and local streets, each with an increasingly less emphasis on mobility and more emphasis on land access.

The four major street classifications are further described below.

Highways

Bay City is served by one highway. US 101 is on the National Highway System (NHS), and in the adopted OHP, it is classified as a statewide highway and a scenic byway. US 101 serves as the major route through Bay City and although the City has no direct control over the state highway, adjacent development and local traffic patterns are heavily influenced by the state highway.

Arterials

Arterial streets are intended to provide for high volume travel between or within communities, or to and from collectors and other arterials. Arterial streets often provide for left turn channelization at key intersections and facilities for two-way bicycle travel and pedestrians are required with any new construction or reconstruction. The design of arterials may guide the provision of on-street parking and provided limitations to access for abutting properties to reduce conflicts with through-moving traffic. In Bay City, US 101 is the only designated principal arterial. It has a sidewalk along only a small portion of its length (between Tillamook Avenue and 5th Street).

US 101: US 101 is a statewide highway at the west edge of Bay City. It provides the primary access to the city from other points on the coast and the only access to West Warren Street, and to Goosepoint and West Hayes Oyster Drives. The posted speed on US 101 within the city limits is 45 mph. Similar to other communities on the Oregon Coast, Bay City experiences heavy increases in traffic volumes during the summer tourist season. At the Rockaway automated traffic recorder (ATR), which is located about 7 miles north of Bay

City on US 101, traffic volumes increase approximately 50 percent during August as compared with average annual average daily traffic (ADT) volumes.

Collectors

Collector streets link residential neighborhoods with smaller community centers and facilities, as well as access to the arterial system. Property access is generally a higher priority for collector streets than for arterial streets, while through-traffic movements are served as a lower priority.

The following collectors exist within the Bay City Urban Growth Boundary (UGB):

- Alderbrook Road, which is for most of its length a Rural Major Collector (the portion within the city limits, which is very short, is considered an urban collector),
- Tillamook Avenue is a minor collector street, and
- 5th Street to Hobbsonville Point Road is also a minor collector street.

Local Streets

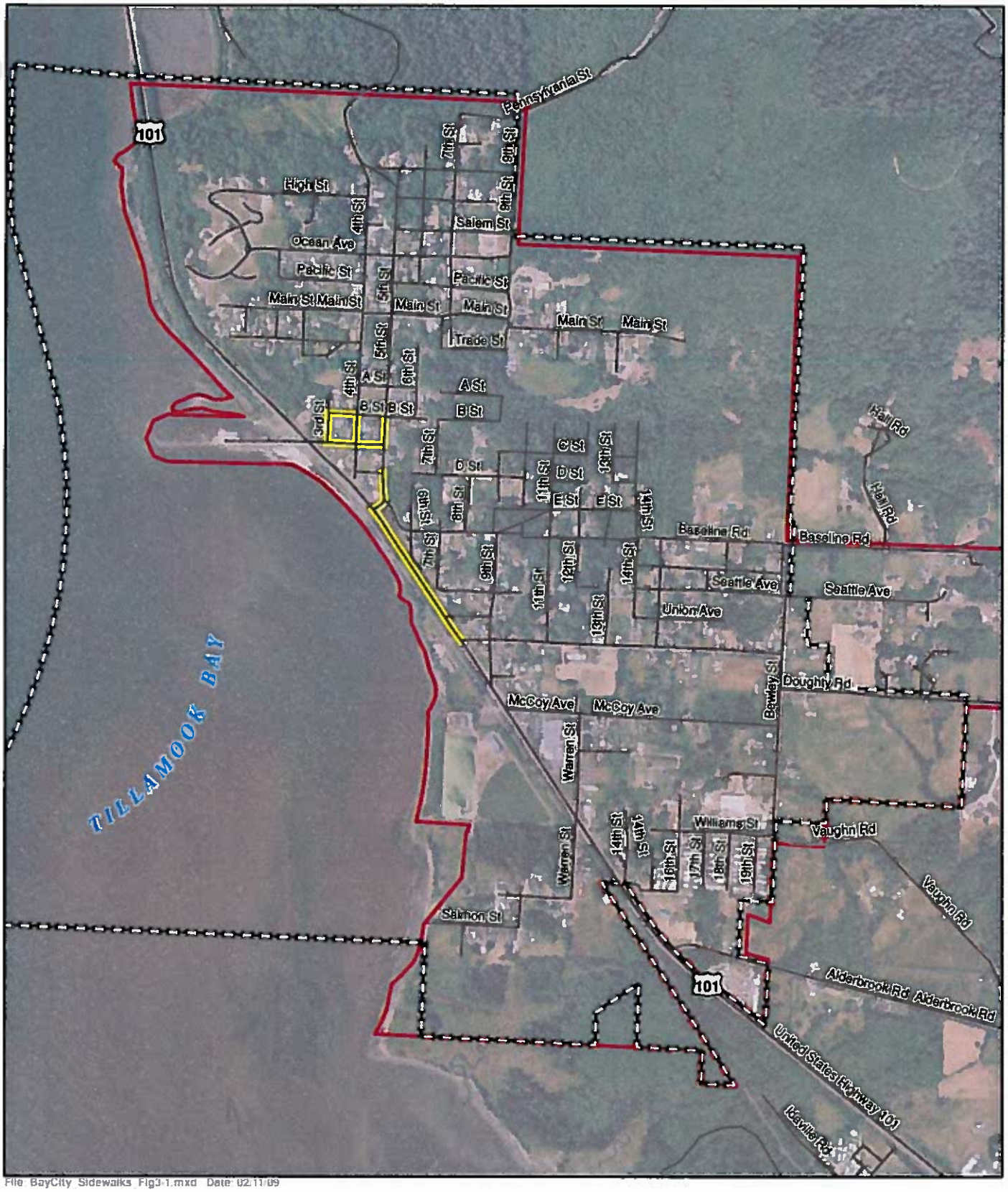
Local streets have the sole function of providing access to immediately adjacent land. Local streets connect housing, commercial, and industrial land uses with the collector and arterial system. Property access is the main priority of local streets and through traffic movement is not encouraged. Typically on-street parking is permitted. In Bay City, some local streets are actually under the jurisdiction of Tillamook County, though they are within the Bay City city limits. These facilities include: Bewley Street from Baseline to Tillamook, McCoy Avenue from US 101 to Warren Street, and Warren Street from US 101 to Spruce Street. The City is working with the County to take jurisdiction of these streets after the County brings them up to City standards.

Pedestrian Facilities

Bay City generally lacks formalized pedestrian facilities. There are only a few short segments of completed sidewalk in areas where new development or public projects have provided them. A sidewalk is provided on one side only for the following street segments as depicted in Figure 3-1.

- Along US 101 from 5th Street to Tillamook Avenue,
- On B Street from 3rd Street to 4th Street,
- On 3rd Street from B street to Hayes Oyster Drive,
- On 4th Street from B street to Hayes Oyster Drive,
- On Hayes Oyster Drive and B Street from 3rd Street to 4th Street, and from 4th to 5th Streets along Hayes Oyster Drive, and
- On 5th Street from US 101 to D Street, and from Hayes Oyster Drive to B Street.

Pedestrians currently walk on the roadways or along gravel paths adjacent to the paved roads. There are no marked crosswalks or formal off-street paths in or adjacent to downtown Bay City. There is a need to encourage the development of a more walkable community with pedestrian facilities along the railroad right of way, two pedestrian crossings of US 101, and a more complete system throughout the city.



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N

0 500 1,000 1,500

Scale in Feet

Existing Sidewalk

Paved Roadway

City Limit

UGB

Figure 3-1.
Existing Sidewalks

Transportation Refinement Plan
Bay City, Oregon

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Bicycle Facilities

US 101 has been designated as the Oregon Coast Bicycle Route and each year thousands of cyclists travel on the shoulders of this highway. Most cyclists travel southbound in the direction of prevailing winds. There are no on-street bicycle lanes, designated bike routes, shared use paths or secure bike parking facilities in Bay City. Pedestrian and bicycle trip generators in Bay City include the post office, city park, library, the Bay City Arts Center, the Methodist church, and businesses, such as Art Space, Pacific Oyster, Downie's Cafe, Center Market and The Landing.

Transit and Intermodal Travel

Public transportation in Bay City is provided by the Tillamook County Transportation District (TCTD). The bus makes one stop in downtown Bay City and provides daily service to Tillamook County, Portland, and the Clatsop County Transportation District through a connection at Cannon Beach, OR. From Portland, passengers have access to the Portland transit system, the international Airport, Amtrak rail service, and Greyhound bus service.

There are currently no taxi companies based in Bay City, but there are several taxi companies operating in the Tillamook area which serve the city.

The local railroad does not provide service to Portland, as it is used for distribution of freight. The local excursion train does not stop in Bay City, nor does Amtrak have a local stop. Up until 2007, the rail line provided twice daily transport of goods including logs and milled lumber from Portland to Longview Washington. A fun run train is in operation from Garibaldi to Wheeler and could stop in Bay City. The rail right of way in Bay City is 60-fee wide and provides connectivity between Warren Street and Hayes Oyster Drive. There has been some discussion of using this right of way for pedestrian and bicycle purposes.

The Amtrak Cascades line runs from Eugene, Oregon to Vancouver, British Columbia. The Amtrak Coast Starlight links Seattle, Washington to Los Angeles, California. The nearest Amtrak train station is in Portland Oregon.

The closest commercial, scheduled, air passenger service is provided from the Portland International Airport (PDX). The nearest private air passenger service is at the Tillamook Airport.

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4. BASE YEAR (2010) TRAFFIC OPERATIONS

This section addresses base year transportation system volumes and operations on US 101 at key study area intersections in the Bay City:

- US 101 at Hayes Oyster Drive/C Street
- US 101 at 5th Street
- US 101 at Tillamook Avenue
- US 101 at Warren Street North leg
- US 101 at Warren Street South leg

Each of the intersections are stop-controlled on the minor street approaches. Existing lane configurations for the study area intersections are shown in Figure 4-1.

4.1 INTERSECTIONS OPERATIONAL STANDARDS

Within the state of Oregon traffic operations are evaluated based on two sets of criteria or standards. The operative standard used by ODOT for state highways is the volume-to-capacity (v/c) ratio, and is expressed in terms of a ratio between traffic volumes and the roadway or intersection's capacity. Many local communities assess the quality of traffic performance in terms of intersection or roadway levels of service (LOS). These two operational standards are described below.

Volume-to-Capacity (V/C) Standard

Based on the OHP, ODOT uses v/c ratios to measure state highway performance rather than intersection or roadway levels of service. A v/c ratio expresses the relationship between traffic volumes and the roadway or intersection's theoretical capacity. Various V/C performance thresholds are applied to all state highways based on functional classification of these facilities. These thresholds define the point at which traffic congestion becomes significant and roadway or intersection improvements are considered. The 1999 OHP defines the performance threshold for US 101 as a v/c ratio equal to or less than 0.75 (for locations where speeds are 45 mph or greater). This performance measure establishes the minimum standard of acceptable operation. (A v/c ratio of 0.75 means that 75 percent of the capacity of the roadway is utilized based on an established planning level capacity and measured traffic volume.)

Intersection Levels of Service

Another measure of intersection operating performance during peak travel periods is based on average control delay per vehicle entering the intersection. This delay is calculated using equations that take into account turning movement volumes, intersection lane geometry and traffic signal features, as well as characteristics of the traffic stream passing through the intersection, including time required to slow, stop, wait, and accelerate to move through the intersection. Various levels of delay are then expressed in terms of LOS for either signalized or unsignalized intersections. The various LOS range from LOS A (free-flow conditions) through LOS F (operational breakdown). Between LOS A and LOS F, progressively higher LOS grades reflect increasingly worse intersection performance, with higher levels of control delay and increased congestion and traffic queues. Characteristics of each LOS are briefly described below in Table 4-1.

Table 4-1. Level of Service Definitions

Level of Service	Average Delay/Vehicle (sec.) Signalized	Unsignalized	Description
A (Desirable)	<10 seconds	<10 seconds	Very low delay; most vehicles do not stop.
B (Desirable)	>10 and <20 seconds	>10 and <15 seconds	Low delay resulting from good progression, short cycle lengths, or both.
C (Desirable)	>20 and <35 seconds	>15 and <25 seconds	Higher delays with fair progression, longer cycle lengths, or both.
D (Acceptable)	>35 and <55 seconds	>25 and <35 seconds	Noticeable congestion with many vehicles stopping. Individual cycle failures occur.
E (Unsatisfactory)	>55 and <80 seconds	>35 and <50 seconds	High delay with poor progression, long cycle lengths, high V/C ratios, and frequent cycle failures.
F (Unsatisfactory)	>80 seconds	>50 seconds	Very long delays, considered unacceptable by most drivers. Often results from over-saturated conditions or poor signal timing.

Source: 2000 Highway Capacity Manual, Transportation Research Board.

4.2 TRAFFIC VOLUMES

ODOT provided 16 hour turning movement counts for the study intersections that were collected in September 2008. An adjustment to the count data was required to translate data from previous years so that they all represented the 2010 base year volumes. Additionally, as traffic volumes vary with the seasons, further adjustments were required for counts taken outside of the peak summer season to ensure that they reflect "typical" conditions for use in assessing design and improvement options. The turning movement volumes represented in Figure 4-2 reflects seasonally adjusted 2010 traffic volume or 30th Highest Hour (30th HV). The 30th highest hour of the year represents the time period used for design of roadway improvement projects. Hours higher than the 30th are typically holidays and other high-traffic days of the year, and it is not appropriate to design for the highest hour as the design may be overbuilt. The methodology and calculation for these adjustments is summarized in Appendix A.

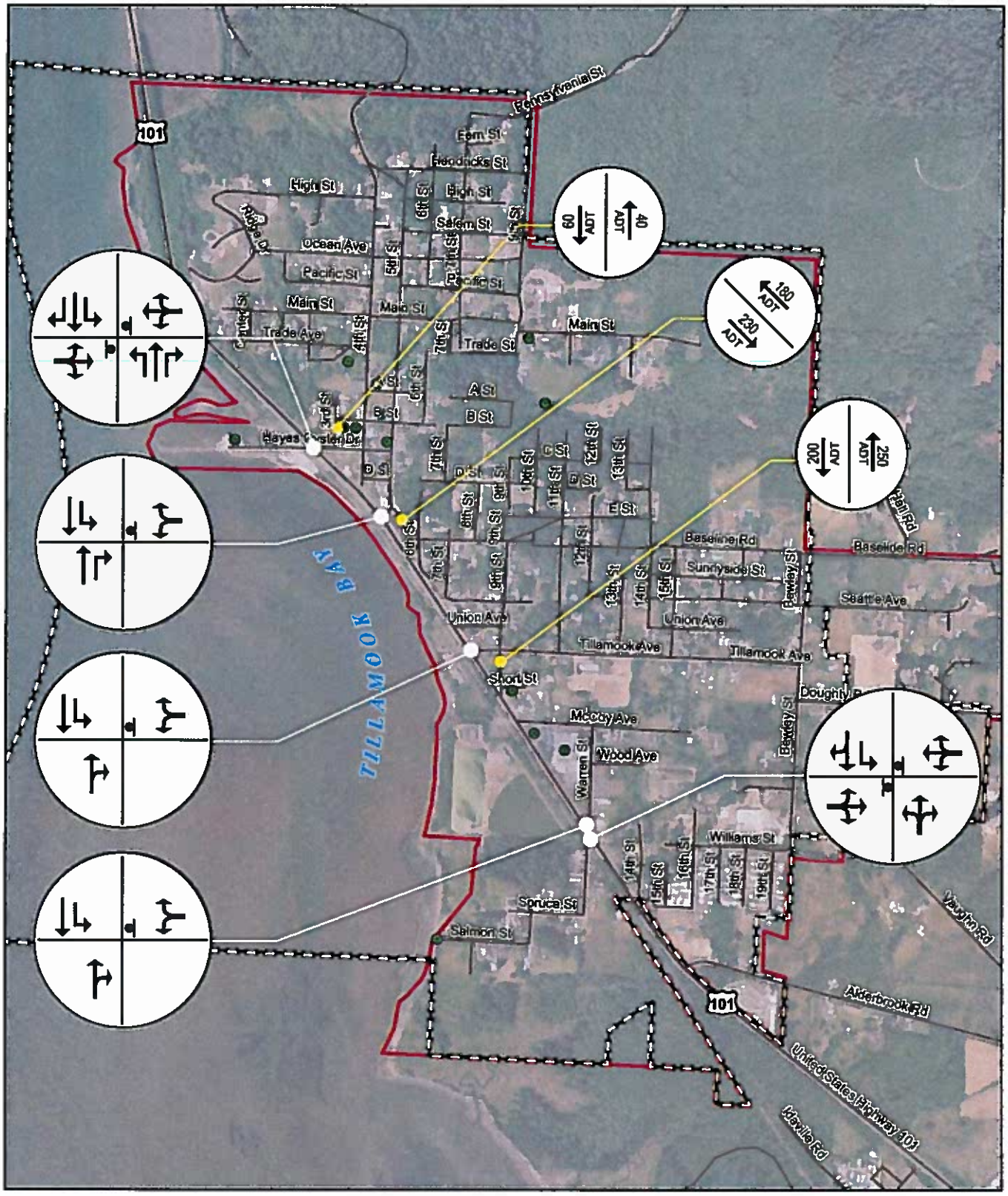
In addition to turning movement counts at the study intersection, roadway tube counts were collected over a 24-hour period at three locations on the local street network. The ADTs for these locations are indicated on Figure 4-1. The data sheets are provided in Appendix A.

4.3 TRAFFIC OPERATIONS

Traffic operations analysis was conducted both for key study area intersections and for segments of US 101 through the study area. The analysis process and results are discussed below.

Intersection Operations Analysis

The analysis of 2010 30th HV traffic operations was conducted using a Synchro traffic simulation model developed specifically for the study area intersections. This model includes field-verified geometrics and other relevant physical data for each intersection. Analysis procedures follow guidelines in the ODOT Transportation Planning and Analysis Unit (TPAU).



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Scale in Feet

- Points of Interest
- Paved Roadway
- City Limit
- UGB
- XX ADT Average Daily Traffic Volume

Figure 4-1.
Existing Lane Characteristics at Study Intersections

Transportation Refinement Plan
Bay City, Oregon

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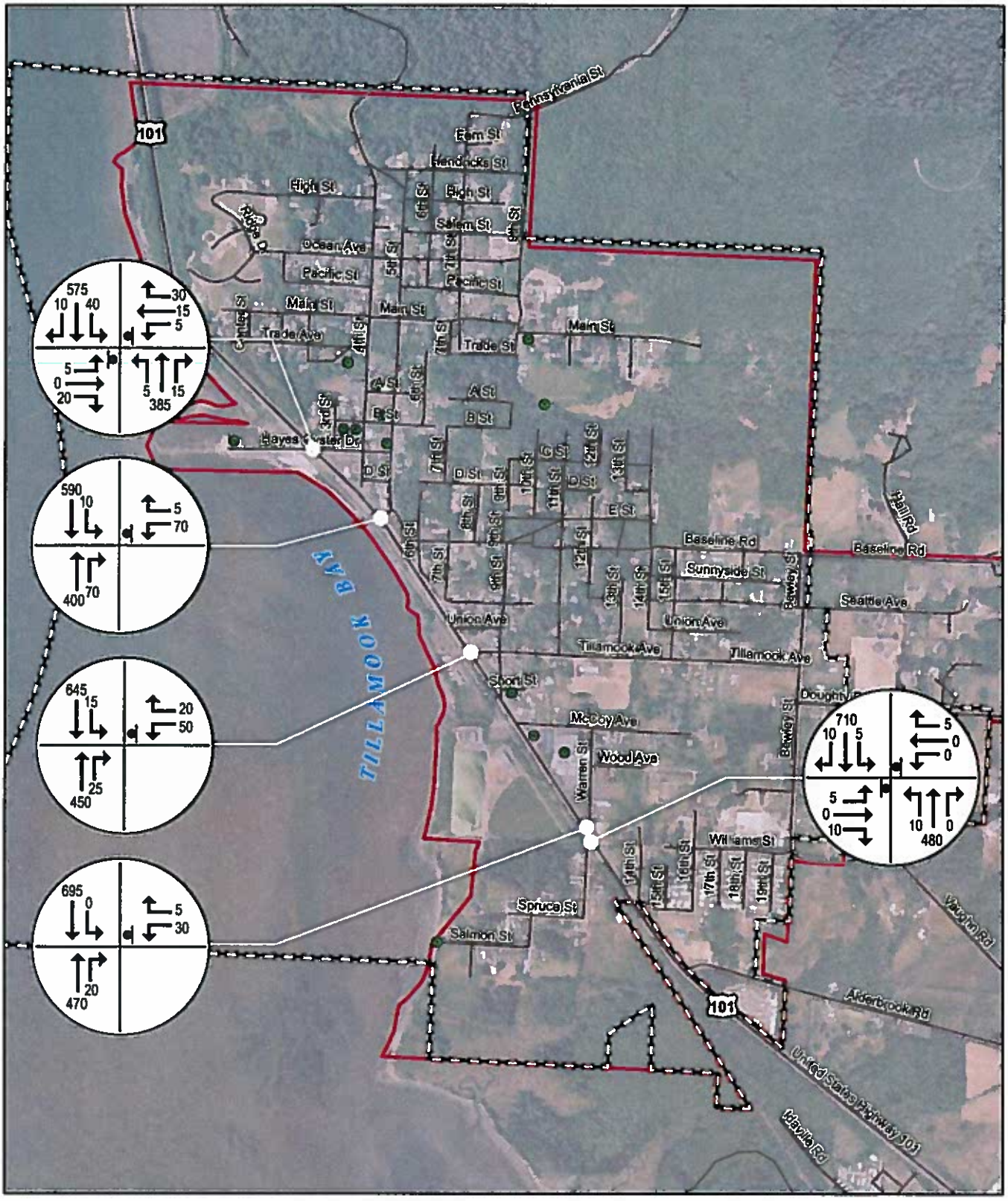

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Scale in Feet

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- UGB
- XX ADT Average Daily Traffic Volume

Figure 4-2.
2010 Study Intersections Volumes (30 HV)

Transportation Refinement Plan
Bay City, Oregon

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Table 4-2 summarizes 2010 traffic operations for the 30th HV at the intersections in the study area. Data in these tables includes the overall intersection V/C ratios, average intersection delay, and intersection LOS. Intersection analysis worksheets are included in Appendix B. Currently, the intersections generally experience minimal delays and operate within acceptable LOS standards.

Table 4-2. 2010 Traffic Operations Analysis Results

Unsignalized Intersection/ *Critical Movement*	V/C Ratio	Critical Delay (sec/vehicle)	Critical LOS
US 101 at Hayes Oyster Drive/C Street			
Westbound Approach	0.12	13.8	B
Eastbound Approach	0.07	14.0	B
US 101 at 5th Street			
Southwestbound Approach	0.20	15.3	C
US 101 at Tillamook Avenue			
Westbound Approach	0.19	15.5	C
US 101 at Warren Street North leg			
Southbound Approach	0.21	29.3	D
US 101 at Warren Street South leg			
Northbound Approach	0.08	23.2	C

Note 1: V/C ratio is a ratio between traffic volumes and the roadway or intersection's capacity.
Note 2: LOS means intersection level of service.
Note 3: "Critical Delay" and "Critical LOS" refers to the delay or LOS experienced for the specific intersection traffic movement listed.
Note 4: Bold type indicates failure to meet standard.

Roadway Segment Operations

To supplement the analysis of existing traffic operations at key intersections, an assessment was conducted of the highway segment to determine how well US 101 would function. The results of this analysis indicate that US 101 will operate at 0.35 v/c in the northbound direction and 0.49 v/c in the southbound direction. Analysis worksheets are included in Appendix B.

4.4 CRASH HISTORY

Crash data for the study area intersections were provided by the ODOT for 5-year period from January 1, 2003 through December 31, 2007. Analysis of this data was conducted for both roadway segments through the study area and at the key intersections. Appendix C includes crash analysis data and calculations.

Roadway Segment Crash Analysis

Roadway segment crash data is analyzed on the basis of accidents per million vehicle miles of travel (MVMT), which considers both the number of crashes and the level of exposure to crashes expressed in terms of the total traffic volume carried along the roadway segment.

Table 4-3 identifies crash experience for a 1.9 mile segment of US 101 in Bay City. Using 5-year crash data, analysis indicates that the segment has a very low crash rate, although half of the crashes were injurious and one resulted in a fatality. US 101 segment crash experience in Bay City places it at 0.09 crashes/MVMT which is below the average crash rate of 0.71/MVMT for all rural principal arterial highways in Oregon (based on data collected and

analyzed for the period from 2003 through 2007, according to the ODOT Crash Rate Table II). A review of the data for US 101 through the study area indicates that turning collisions resulted in the most injury collision including the fatality. This may be as a result of the vehicles trying to access US 101, a higher speed facility (posted 45 mph), from side streets and driveways.

Table 4-3. 2003-2007 US 101 Segment Crash History

Segment	Crash Type					Crash Severity			Total	
	Rear-end	Turn	Angle	Side-swipe	Other	PDO	Injury	Fatal	Reported Crashes	Crash Rate/ MVMT
US 101 (approx. 1.9 miles)	3	5	0	1	5	7	6	1	14	0.09

Source: ODOT 2008.
Note 1: PDO means Property Damage Only. "Other" crashes include backing, pedestrian collisions, head-on, and hitting fixed objects.
Note 2: MVMT means million vehicle miles of travel.

The ODOT Project Safety Management System tracks crash data by district for segments and specific sites. The Safety Investment Program Segment Ratings, evaluates the number of fatal/injury crashes per 5 mile segments from Category 1, with zero crashes to Category 5 with more than 10 crashes. Using 2003-2007 data, US 101 in the study area is rated as a Category 2 (1-2 fatal/injury crashes per 5 mile segment). According to the Safety Priority Index System (SPIS) there are no crash sites in the study area that require monitoring or mitigation.

Intersection Crash Analysis

The number of crashes per million entering vehicles (MEV) is used to calculate an intersection's "crash rate." The rate is then compared to crash rates on similar type of facilities throughout Oregon. A rate greater than other similar facilities is commonly used as a threshold to identify locations that warrant further analysis, potentially leading to implementation of measures to improve safety. Table 4-4 identifies crash rates and types and severity at study area intersections. None of the study intersections exceed 1.0/MEV. No further analysis or mitigation is recommended.

Table 4-4. 2003-2007 Bay City Study Area Intersection Crash History

Intersection	Crash Type					Crash Severity			Total	
	Rear-end	Turning	Angle	Side-swipe	Other	PDO	Injury	Fatal	Reported Crashes	Crash Rate/ MEV
US 101 at Hayes-Oyster Drive/ C Street	0	0	0	0	0	0	0	0	0	0.00
US 101 at 5th Street	0	1	0	0	0	1	0	0	1	0.06
US 101 at Tillamook Avenue	0	1	0	0	0	1	0	0	1	0.06
US 101 at Warren Street (north leg)	1	0	0	0	0	0	1	0	1	0.06
US 101 at Warren Street (south leg)	0	0	0	0	0	0	0	0	0	0.00

Source: ODOT 2008.
Note: PDO means Property Damage Only and MEV means Million Entering Vehicles. "Other" crashes include sideswipes and head on collisions.

5. FUTURE (2030) NO-BUILD TRAFFIC OPERATIONS

This chapter presents an analysis of future (2030) traffic conditions assuming that there will traffic volume increases along US 101 and development within Bay City itself over time. Included in this chapter is a discussion of future traffic volumes, future traffic operations analysis for intersections and roadway segments, and a summary of signal and turn lane warrant analysis.

5.1 TRAFFIC VOLUMES

An adjustment to the 2010 volumes was required to represent 2030 volumes. An annual growth rate was applied to US 101 traffic to yield 2030 volumes. Additionally, local traffic growth was estimated and applied to the minor street approaches in Bay City based on potential land development. The 2030 traffic volume data is summarized in Figure 5-1. The methodology for the adjustments is summarized in Appendix A.

5.2 TRAFFIC OPERATIONS

Traffic operations analysis was conducted both for key study area intersections and for segments of US 101 through the study area. The analysis process and results are discussed below.

Intersection Operations Analysis

The Synchro traffic simulation model developed specifically for the study area intersections was also used to assess traffic operations with the forecasted 2030 (30th HV) volumes illustrated in Figure 5-1. This assessment assumes that no improvements would be made to the existing street system, thus incorporating the street network characteristics illustrated in Figure 4-1. Intersection analysis worksheets for 2030 are included in Appendix D.

Table 5-1 summarizes the results of 2030 traffic operational analysis for the 30th HV at the study area intersections. Data in this table focuses on specific critical traffic movements and includes V/C ratios, average intersection delay, and intersection LOS.

Table 5-1. 2030 No-Build Traffic Operations Analysis Results

Unsignalized Intersection/ *Critical Movement*	V/C Ratio	Critical Delay (sec/vehicle)	Critical LOS
US 101 at Hayes Oyster Drive/C Street			
Westbound Approach	0.54	36.6	E
Eastbound Approach	0.16	25.1	D
US 101 at 5th Street			
Southwestbound Approach	0.41	28.0	D
US 101 at Tillamook Avenue			
Westbound Approach	0.40	28.3	D
US 101 at Warren Street North leg			
Southbound Approach	0.20	24.6	C
US 101 at Warren Street South leg			
Northbound Approach	0.69	168.5	F

Without any improvements, by 2030 all the study intersections with US 101 are expected to meet ODOT's operational standard. However, the minor street approaches experience greater delay accessing US 101 as through traffic levels on US 101 increase. Particularly problematic is the northbound approach at the intersection of Warren Street (south leg) at US 101.

Roadway Segment Operations

To supplement the analysis of 2030 No Build traffic operations at key intersections, an assessment was conducted of the highway segment to determine how well US 101 would function. The results of this analysis indicate that it will operate at 0.49 v/c in the northbound direction and 0.71 v/c in the southbound direction. Analysis worksheets are included in Appendix D.

5.3 WARRANT ANALYSIS

As a step toward identifying and evaluating potential improvements along US 101 in the study area traffic signal and left turn lane warrants were evaluated based on the projected future 2030 traffic volumes. The OTC has authority to place, maintain and operate traffic control devices on state highways. The OTC delegates to the State Traffic Engineer the authority to approve the installation of traffic control devices on state highways. All traffic signals installed on state highways require the approval of the State Traffic Engineer. The traffic signal approval process is established by Oregon Administrative Rules (OAR) 734-020-0400 through 734-020-0500. ODOT's Traffic Manual provides additional information on the traffic signal approval process and specific information to be included in the required Traffic Signal Engineering Investigation.

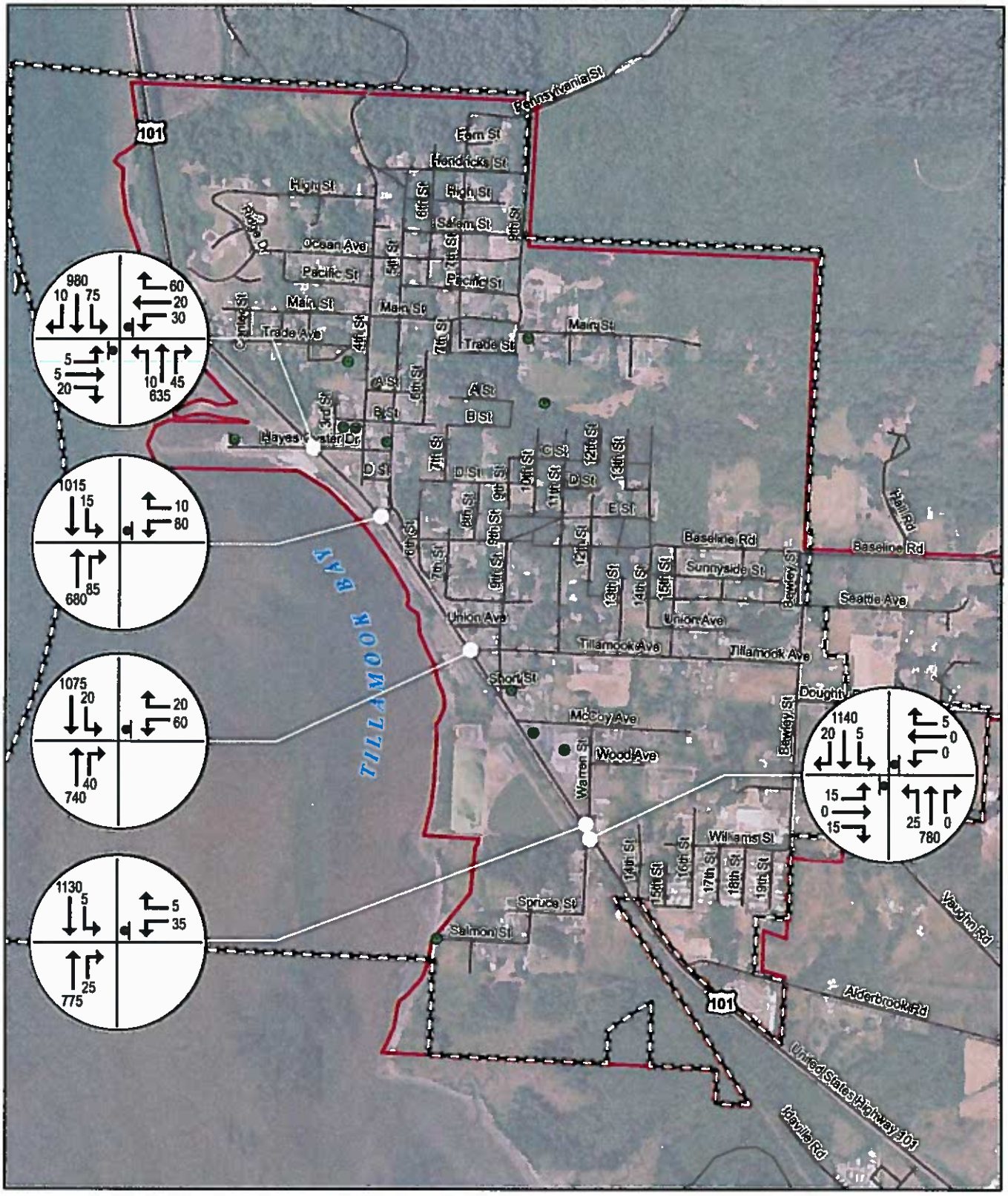
Traffic Signal Warrant Analysis

OAR 734-020-0460 (1) stipulates that only MUTCD Warrant 1, Eight-Hour Vehicular Volume, Case A and Case B may be used to project future needs for traffic signals beyond three years from the present time. Case A and Case B primarily address high volumes on the intersecting minor street and high volumes on the major-street. The unsignalized intersections were evaluated for preliminary signal warrants using the minimum vehicular traffic and interruption of continuous flow warrants, Case A and Case B respectively. The analysis indicates that none of the intersections would meet street warrants at either the 70% or 100% level. Accordingly, signal installation at the intersections in Bay City with US 101 would be unlikely based on existing or future traffic volumes. Analysis worksheets are included in Appendix E.

Meeting preliminary warrants is necessary to install a traffic signal, but it does not mean a signal should be recommended nor does it guarantee installation. Considerations to be evaluated before signal installation include safety concerns, alternatives to signalization, signal systems impacts, delay, queuing, bike and pedestrian needs, railroads, access, consistency with local plans, local agency support, and others. Before a signal can be installed a field warrant analysis will need to be conducted by the Region. If warrants are met, the State Traffic Engineer will make the final decision on the installation of a signal.

Left Turn Lane Warrant Analysis

The intersection of US 101 at Warren Street (south leg) was evaluated to determine the need for a northbound left turn lane. The warrants indicated that a left turn lane is warranted for both the 2010 and 2030 scenarios. The analysis worksheets are included in Appendix E.



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Scale in Feet

- Points of Interest
- Paved Roadway
- City Limit
- UGB
- XX ADT Average Daily Traffic Volume

Figure 5-1.
2030 No Build Study Intersections Volumes (30 HV)

Transportation Refinement Plan
Bay City, Oregon

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Pedestrian Warrant Analysis

The purpose of OAR 734-020-0400 through 734-020-0500 is to establish the process for considering and approving the installation of traffic signals. Additional details for approval and installation of traffic signals can be found in the 1999 OHP and the Manual on Uniform Traffic Control Devices, adopted under OAR 734-020-0005.

The Manual of Uniform Traffic Control Devices provides specific guidance on the warrants for pedestrian signals. The MUTCD provides 8 warrants to be used in determining whether the installation of a traffic signal is justified for a given location. It should be noted that while the MUTCD states that a traffic signal should not be installed unless one or more of the warrants are met, it also emphasizes that meeting one or more warrant shall not in itself require the installation of a traffic signal, and that the analysis of the warrants should be included as part of a comprehensive engineering study. The MUTCD warrants, if evaluated, should be evaluated along with all the other components of a full traffic signal engineering investigation as described in the ODOT Traffic Manual.

The warrants are also used for the determination of appropriate locations for pedestrian signals (Section 4C.05 Warrant 4, Pedestrian Volume). The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street. However, no intersections in Bay City meet or are likely to meet the warrants within the planning period.

The need for a traffic control signal at an intersection or midblock crossing shall be considered if an engineering study finds that both of the following criteria are met:

A. The pedestrian volume crossing the major street at an intersection or midblock location during an average day is 100 or more for each of any 4 hours or 190 or more during any 1 hour; and

B. There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular traffic.

Where these conditions do not apply, a City must work directly with ODOT to determine when conditions are present that would permit a traffic light.

5.4 ACCESS MANAGEMENT AND CONDITIONS

The term access management refers to the process of balancing the need for vehicle access to parcels of land adjacent to roadways with the need for safe and efficient through movement of vehicular traffic on the roadway. Access management can be implemented by a variety of means. These include median controls (for example, raised concrete medians); driveway spacing and/or driveway consolidation (so that there are fewer driveways serving one parcel or multiple parcels), requiring that driveways be placed on lower order streets where a parcel abuts both higher and lower order streets; and intersection spacing to reduce the number of conflict points or signal-controlled locations along a street, as the frequency of these locations can reduce the benefits of effective signal timing progression.

Access management is closely related to street functional classification. Typically, when access controls are in place, the frequency of driveways and intersecting streets is more restrictive along state highways and major arterials where the movement of traffic takes a

higher priority. Access controls are less restrictive along collector streets where there is greater balance between access and mobility. Access controls are restricted only by safety considerations along local streets where property access is the primary function of the street.

Frequent driveway and cross-street access can significantly degrade traffic operations along major streets as motorists must contend with people slowing to turn into adjacent property or attempting to get back onto the major street from a side access location. Not only do frequent driveways adversely affect the operational capacity of a road, they also affect safety since each driveway or intersecting street represents a potential conflict point for through-moving vehicles. The strip development that often occurs as a result of the lack of access control is often inhospitable to pedestrians and bicyclists, and its dispersed uses make efficient transit service difficult.

Access management can be most effectively implemented during the land development process when access locations and localized street improvements can be adapted to ensure that adjacent street traffic-carrying functions are not degraded. Access management controls are more difficult to implement along streets with developed property due to possible right-of-way limitations and/or the concerns of property owners about business or on-site circulation impacts. In these cases, access controls can be incorporated into a roadway improvement project.

Along state highways, access is commonly controlled by ODOT through the purchase of access rights. New access to/from a state highway is provided consistent with the standards adopted in the OHP for each highway classification, its location within an urban or rural area, and its posted speed. Access management guidelines for state highways are published in OAR 734-051. Access management standards along US 101, within the Bay City area, are shown in Table 5-2.

Table 5-2. Access Management Spacing Standards for Approaches on US 101

Posted Speed (mph)	Public and Private Approach Spacing [a]
≥ 55	1,320 feet
50	1,100 feet
40 & 45	990 feet
30 & 35	720 feet
≤ 25	520 feet

Source: OAR 734-051-00115 Table 2

[a] Measurement of the approach road spacing is from center to center on the same side of road.

The consultant team reviewed the ODOT Video Log and noted the locations of access to properties from US 101 on an aerial map. There are five accesses within the city limits and in close proximity to McCoy Avenue. Only one access is located on the west side of US 101 (directly across from McCoy Avenue). The four accesses on the east side of US 101 are all rather close together. Two driveways are just south of McCoy Avenue and serve the Tillamook Smoker Outlet and filling station, they are close together (approximately 80 ft) and don't meet the standard. The final two driveways are just north of McCoy Avenue and provide access to a gravel parking lot for an adjacent business. These two accesses are close together (approximately 90 ft) and don't meet the standard.

6. SUMMARY OF DEFICIENCIES AND NEEDS

Bay City has a diverse set of transportation deficiencies and needs. Like most cities, there is a maintenance and repair backlog, with insufficient government revenues to address all of the City's needs. It is therefore, particularly important for the Refinement Plan to include a realistic, financially constrained, and prioritized list of needs, and recommended improvement projects to address those needs.

The needs can generally be grouped into the following categories. Many projects will serve more than one function and could be included in more than one category.

1. Capacity improvements (which include projects that add lanes, turn lanes, and otherwise accommodate future growth in traffic),
2. Safety projects (which are designed to address specific sites where crash rates are highest),
3. Bike and pedestrian improvements,
4. Connectivity improvements (which access previously un-served portions of the urban growth area, or better connect areas of the UGA), and
5. Traffic calming (which helps improve the livability of certain areas and can include different design features), and
6. Code amendments (areas of the development standards, street design documents, and other plans that may need amending in order for full implementation of the Refinement Plan).

At the first meeting of the Project Advisory Committee, and in conversations with members of the City and State Project Management Team, discussions have been held on the City's different deficiencies and needs. These ideas have been combined with the technical analysis reported on in this memorandum. The following draft list of needs will be furthered refined and prioritized, as part of the Bay City Refinement Plan. Many of these Needs are identified on Figure 6-1. There are projects that the City has previously identified as being necessary. Many of these have not yet been the subject of an engineering analysis. Until further warrant analysis or engineering studies are conducted, these proposed projects will be referred to not as 'needs' but as "strong desires."

1. Capacity improvements.
    a. The analysis for this Refinement Plan identified only one improvement necessary to accommodate future growth in Bay City. At the southern intersection of Warren Street and US 101 there is a need for the installation of a left turn pocket. The lane would serve northbound trips, turning left onto Warren Street. When this improvement is added, the alignment of West Warren Street with East Warren Street should be improved, as far as is practicable.
    b. There is also a need for secondary egress from the "Goosepoint" area located West of US 101 and accessed by Warren Street.
2. Safety projects.
    a. The above mentioned left turn pocket would significantly improve safety at that intersection. The design should, if possible, include a realignment of the roadways that intersect with US 101.

b. Crossing improvements will significantly improve safety for pedestrians crossing US 101. These have been envisioned at Hayes Oyster Drive and at Warren Street.

c. There is a strong desire for a turn lane at Spruce Street.

d. There is a strong desire for a turn lane at Alderbrook Road.

e. There is a desire to slow traffic speeds to 45 mph at the Bay City RV Park. Moving the 45 mph sign slightly further south will help to decrease speeds of vehicles entering the city.

3. Bike and pedestrian improvements.

   a. There is a strong desire for at least one safe pedestrian crossing on US 101. The Bay City Vision calls for two. The first crossing should be added at Hayes Oyster Drive with full streetscape improvements to both the east and the west sides of US 101. The second crossing of US 101 should be considered at Warren Street or incorporated into any new secondary vehicular access across US 101.

   b. There is a need for the development of walking and bike paths in the public rights of way. Most of the Public Rights of way are 60' wide. The improved streets are typically no larger than 24' wide. This would allow walking and bike paths to be developed except where the slope or the presence of streams would prevent development.

   c. The Port of Tillamook Bay Railroad right-of-way is 60' in width and is a 10 mph to 15 mph freight line that runs up to twice daily. This right-of-way could provide an opportunity to connect Hayes Oyster Drive with West Warren Street and the Goosepoint Area with a pedestrian and bicycle facility.

   d. The bike and pedestrian recommendations in the Downtown Transportation Plan are also needed to provide a more walkable downtown and an economic stimulus. The Downtown Transportation Plan has made recommendations for downtown street cross section with bike lanes and five foot sidewalks. These recommendations will be modified and incorporated with the following tasks of this Refinement Planning effort.

   e. Post signage for a bike route through Bay City that would run from 5th Street to US 101 to Tillamook Avenue to McCoy Street to Warren Street OR to Bewley's Road to Williams Avenue to 16th Street to Spruce Street to a possible crossing of US 101.

4. Traffic calming.

   a. There is a strong desire to slow traffic on US 101.

   b. There is a strong desire to slow traffic on 4th and 5th streets, north of downtown.

5. Code amendments.

   a. There is a need for planning and codification in the urban growth area that would provide mechanisms for shadow platting.

   b. There is a need to add native street trees to the street standards that would be installed with street development.

   c. There is a need to clearly identify stormwater drainage requirements in standards for all street maintenance and construction.

d. Add bike and / or pedestrian "walking paths" as a standard for all streets with adequate width.

e. There is a need for different ways to collect development fees, including potentially a system development fee, a traffic impact fee or creating a road district.

f. There is a need for a short list of recommended street trees focused on native trees which should be easy to maintain, cause fewer maintenance problems, have controlled growth.

g. There is a need for standard street cross sections for a residential street, a minor collector, and the two types of cross sections for the downtown as identified in the Downtown Transportation Plan.

h. City should incorporate US 101 to the RV Park to gain more options for improvements.

i. Local street standards should include options for a sidewalk or a pedestrian path buffered from vehicular traffic by native plants and trees.

j. There need to be updates to the stormwater regulations as they apply to public projects as well as private developments.

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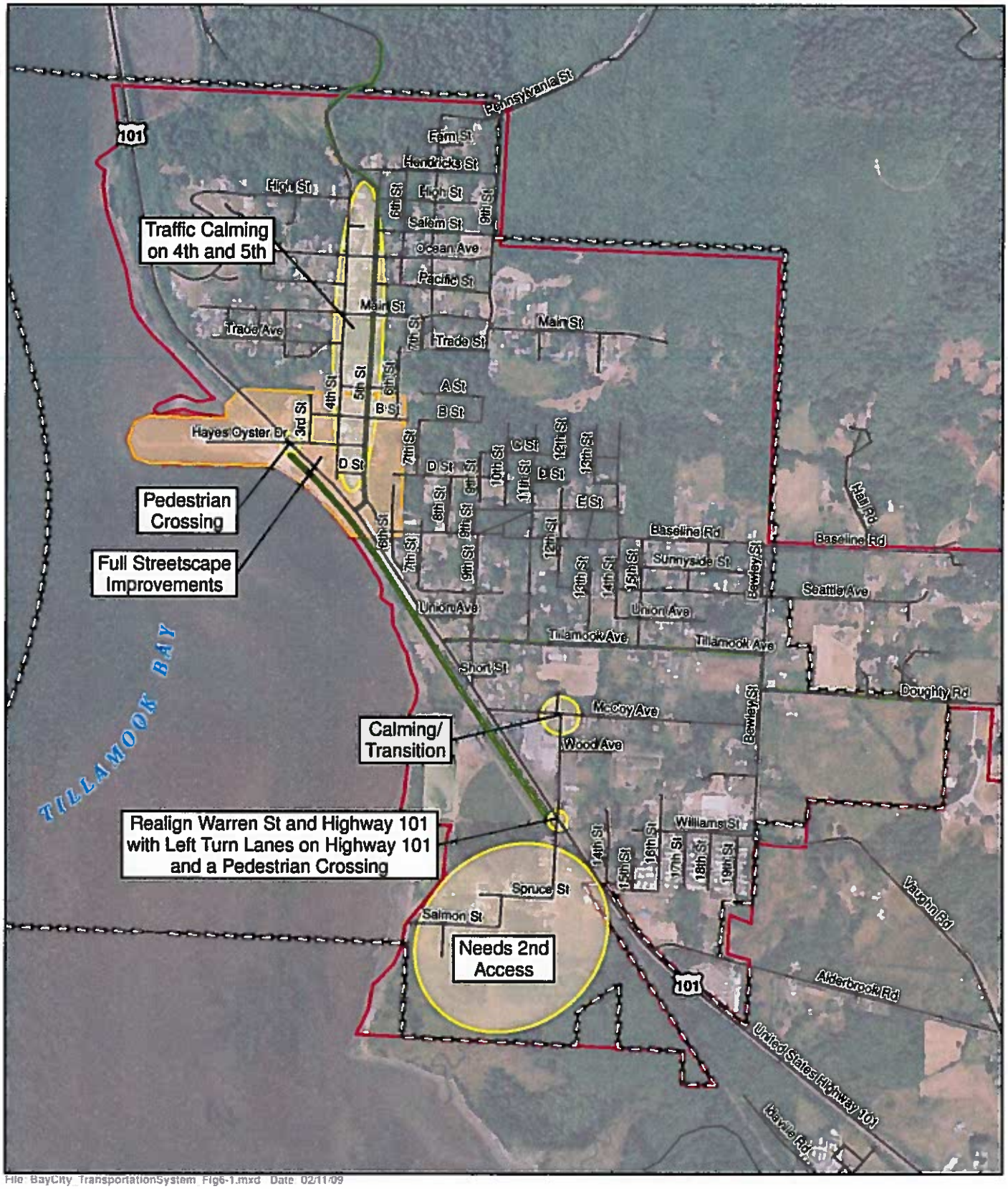

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Scale In Feet

- Paved Roadway
- Bike Lane
- Bike/Pedestrian Path
- Full Streetscape Area
- Areas with Special Needs
- City Limit
- UGB

Figure 6-1. Transportation Needs and Roadway Projects

Transportation Refinement Plan
Bay City, Oregon

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Bay City Transportation Refinement Plan Technical Memorandum #2 Transportation Alternatives

Prepared for

City of Bay City
P.O. Box 3309
Bay City, OR 97107

March 2009

CITATION

This project is partially funded by a grant from the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. This TGM grant is financed, in part, by federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), local government, and State of Oregon funds.

The contents of this document do not necessarily reflect views or policies of the State of Oregon.

Parametrix. 2009. Bay City Transportation Refinement Plan Technical Memorandum #2 Transportation Alternatives. Prepared by Parametrix, Portland, Oregon. March 2009.

CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

Prepared by Shelley Oylear, EIT and Derek Chisholm, AICP

Checked by Anne Sylvester, PTE

Approved by Anne Sylvester, PTE

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

LIST OF TABLES

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ACRONYMS

ADA	Americans with Disabilities Act
CDBG	Community Development Block Grant
DLCD	Department of Land Conservation and Development
EDU	Equivalent Dwelling Unit
FHWA	Federal Highway Administration
IPF	In-Pavement Flasher System
IRL	In-Roadway Light
ITE	Institute of Traffic Engineers
LID	Local Improvement District
LOS	Level of Service
LWCF	Land and Water Conservation Fund
mph	miles per hour
MUTCD	Manual on Uniform Traffic Control Devices
ODOT	Oregon Department of Transportation
OECDD	Oregon Department of Economic and Community Development
OHDM	Oregon Highway Design Manual
OPRD	Oregon Parks and Recreation District
ORS	Oregon Revised Statute
OTIB	Oregon Transportation Infrastructure Bank
PAC	Project Advisory Committee
SDC	System Development Charge
SCA	Small City Allotment
STIP	Statewide Transportation Improvement Program
Synchro	HCM-Compatible Traffic Analysis Software for Intersections
TCD	traffic control device
TMS	Traffic Management Section
TPAU	Transportation Planning and Analysis Unit
TPR	Transportation Planning Rule
TSP	Transportation System Plan
UGA	Urban Growth Area
UGB	Urban Growth Boundary
V/C	Volume-to-Capacity (ratio)

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1. INTRODUCTION

This report is one of several technical memoranda that will be prepared to support development of a Transportation Refinement Plan for the City of Bay City. This report identifies and evaluates potential transportation improvements designed to meet transportation needs identified in Technical Memorandum #1: Conditions, Deficiencies, and Needs. These transportation needs were based on analysis of past and present planning efforts, discussions with City and State staff, input from the project's Project Advisory Committee (PAC), and analysis of existing and future operations at key intersections.

1.1 SUMMARY OF DEFICIENCIES AND NEEDS

Bay City has a diverse set of transportation deficiencies and needs. Like most cities, there is a maintenance and repair backlog, with insufficient government revenues to address all of the City's needs. The City is required to develop strategies to accommodate future growth in the urban area. It is therefore, particularly important for the Refinement Plan to include a balanced, realistic, and financially constrained, prioritized list of needs and corresponding improvement projects to address those needs.

The proposed changes to the transportation system in Bay City are categorized by implementing mechanism and mode. There are both proposed improvement projects as well as amendments to the City's policy and code. Both improvements and policy changes have been developed to address traffic safety, pedestrian access, stormwater drainage, and many other challenges. The categories of proposed changes, which will also serve as the structure of this report, are provided below:

New Street Standards	**(Section 2.1)**
Additional Code and Policy Recommendations	**(Section 2.2)**
Bike and Pedestrian Policy Recommendations	**(Section 2.3)**
Finance	**(Chapter 3)**
Roadway System Improvements	**(Section 4.1)**
Traffic Calming	**(Section 4.2)**
Bike and Pedestrian System Improvements	**(Chapter 5)**
Future Transportation System	**(Chapter 6)**

At the first meeting of the PAC, and in conversations with members of the City and State Project Management Team, the City's different deficiencies, needs, and opportunities were identified. These ideas and issues have been combined with the technical analysis detailed in Technical Memorandum #1. The following list of needs will be furthered refined and prioritized as part of the Bay City Refinement Plan. In addition to those needs listed below, there are other projects that the City has previously identified as being necessary. Until these warrant further analysis or until engineering studies are conducted, these proposed projects will be referred to not as 'needs' but as "strong desires."

1. Roadway System Policy Recommendations
    a. There is a need for planning and codification in the Urban Growth Area (UGA) that would provide mechanisms for shadow platting.
    b. There is a need to clearly identify stormwater drainage requirements in standards for all street maintenance and construction.

c. There is a need for a short list of recommended street trees, focused on native trees, which should be easy to maintain, create fewer maintenance problems, and have controlled growth.

d. There is a need for standard street cross-sections for residential streets, minor collectors, and the two types of cross-sections for the downtown as identified in the Downtown Transportation Plan.

e. Local street standards should include options for a sidewalk or a pedestrian path buffered from vehicular traffic by native plants and trees.

2. Bike and Pedestrian System Policy Recommendations

   a. Add bike and/or pedestrian "walking paths" as a standard for all streets with adequate width.

   b. Encourage bike use with bike parking and other requirements.

3. Other Policy Recommendations

   a. There is a need for different ways to collect development fees, including a potential system development fee, a traffic impact fee, or creating a road district.

   b. City should incorporate US 101 to the RV Park to gain more options for improvements.

4. Roadway System Improvement Projects

   a. The analysis for this Refinement Plan identified only one improvement necessary to accommodate future growth on US 101 in Bay City. At the southern intersection of Warren Street and US 101, there is a need for the installation of a left-turn pocket. The lane would serve northbound trips turning left onto Warren Street. When this improvement is added, the alignment of West Warren Street with East Warren Street should be improved, as far as is practicable.

   b. There is also a need for secondary egress from the "Goose Point" area located west of US 101 and accessed by Warren Street.

   c. There is a strong desire for a turn lane on Spruce Street at US 101.

   d. There is a strong desire for a turn lane on Alderbrook Road at US 101.

   e. There is a strong desire to slow traffic on US 101.

   f. There is a strong desire to slow traffic on 4th and 5th Streets north of downtown.

   g. There is a desire to slow traffic speeds to 45 mph at the Bay City RV Park. Moving the 45 mph sign slightly further south will help to decrease speeds of vehicles entering the city.

   h. There is a strong desire to improve the intersection of 5th Street, US 101, and Portland Avenue.

5. Bike and Pedestrian System Improvement Projects

   a. There is a strong desire for at least one safety-enhanced pedestrian crossing on US 101; the Bay City Vision calls for two. The first crossing should be added at Hayes Oyster Drive with full streetscape improvements to both the east and the west sides of US 101. The second crossing of US 101 should be considered at Warren Street or incorporated into any new secondary vehicular access across US 101.

b. There is a need for the development of walking and bike paths in the public rights-of-way.

c. The Port of Tillamook Bay Railroad right-of-way could provide an opportunity to connect (with a pedestrian and bicycle facility) Hayes Oyster Drive with West Warren Street and the Goose Point Area.

d. The bike and pedestrian recommendations in the Downtown Transportation Plan are also needed to provide a more walkable downtown and to support economic growth and development. The Downtown Transportation Plan has made recommendations for downtown street cross-section with bike lanes and 5-foot sidewalks.

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2. KEY ROADWAY SYSTEM POLICY RECOMMENDATIONS

The needs in Bay City that can be met by roadway system policy and code changes are diverse. These needs include a full set of design standards for roadways, as well as numerous, more minor changes to local code and policy.

2.1 NEW STREET STANDARDS

As described in Technical Memorandum #1 and shown on Figure 2-1, the City currently has the following two functional classifications for public streets: Minor Collector and Local Access. Reflecting the predominance of residential uses within the city, most streets are classified as Local Access. It is recommended that a new functional classification system be adopted with an Arterial cross-section (for US 101), two new Collector types (Urban and Urban-Downtown), and two new local street types (one with and one without a sidewalk). Developing a functional classification system must take into account existing and future anticipated land uses, the current prevalence of unimproved streets, steeply sloping terrain, the difficulty of safely accommodating the towing of boat trailers on narrow streets, and the lack of an adequate storm drainage system.

These new facilities will be shown in the Bay City Future Transportation System Map discussed later in this report. The new standards should be referenced in the Comprehensive Plan and described in detail in the Street and Storm Drainage System Design Standards.

Comprehensive Plan Policy Amendments

Recommended Changes to the Street Policies

The following recommended amendment provides enforceability:

2. The City Street Standards as listed in the Public Works Standards shall apply to all proposed subdivisions of land, planned developments, and major street improvements (beyond routine maintenance) sponsored by the City, County or adjacent property owners. In order to vary from these standards, the party proposing the street or road improvements should show to the satisfaction of the City Council why a lesser improvement is adequate based on topography or other unusual circumstances.

The following recommended amendment provides policy support for trails and a gateway on US 101:

9. The City will consider future development of an off-street trail along Patterson Creek and development of a gateway concept for the entrance to Bay City as described in the Bay City Downtown Transportation Plan, Section 4, Preferred Alternatives.

The Downtown Transportation Plan also called for many revisions to the Bay City Street and Storm Drainage System Design Standards. These will be incorporated into the changes recommended by this Refinement Plan. The following cross-sections will also be incorporated into the Refinement Plan.

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File: BayCity_FunctionClass.mxd Date: 02/25/09

N

0 500 1,000 1,500

Scale in Feet

Figure 2-1.
Roadway Functional Classifications

Transportation Refinement Plan
Bay City, Oregon

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2.2 FUNCTIONAL CLASSIFICATIONS

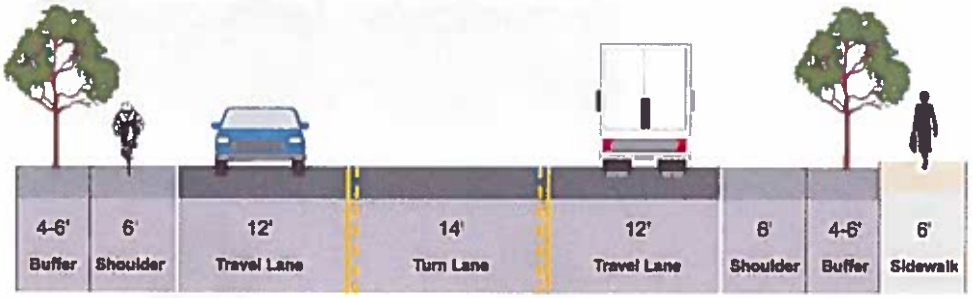
The following recommended cross-sections have been developed to address the need for enforceable, flexible standards. These cross-sections provide for improved multimodal facilities, minimize impervious surface, incorporate improved drainage way designs, and provide a revitalized streetscape for the downtown.

Arterial Street

US 101 plays an important role in both local and through traffic circulation within Bay City. On a local level, the highway links the northern and southern portions of the city, and provides a connection between Bay City homes, businesses, and recreational opportunities and destinations outside the city. The highway also serves as a through route connecting destinations along the Oregon Coast. The City would like to slow traffic down to 45 mph prior to Alderbrook Road as traffic enters the city's Urban Growth Boundary (UGB).

Because of its importance to local traffic circulation, it is recommended that US 101 be designated as the Arterial Street within Bay City's UGA. The cross-section shows a center turn lane, which may not be in place throughout Bay City's incorporated city limits but is at most intersections (see Figure 2-2). US 101 is also intended by City representatives to serve as part of the recommended primary bicycle and pedestrian route system for the city. The addition of shoulders and a sidewalk are recommended to serve those using these modes.

Arterial with Turn Lane



Arterial with Median

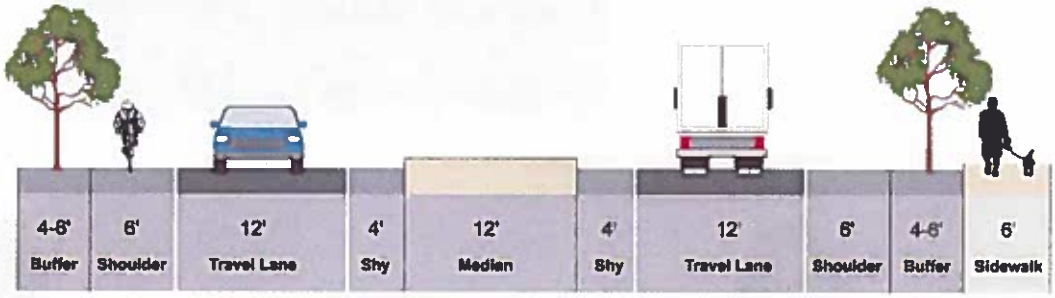


Figure 2-2. Arterial Cross-Sections

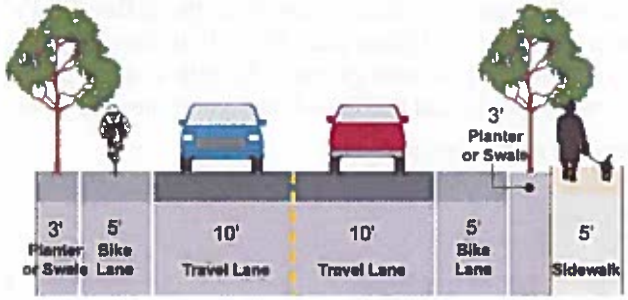
Collector

Collectors in Bay City link residential and business areas with each other and to the recommended Arterial Street (US 101). However, the north and south sides of Bay City have very different terrain and land uses that require consideration of different street standards.

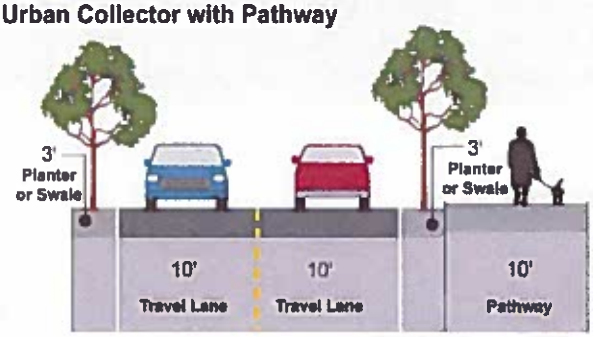
The downtown area contain more intense urban uses including city hall, commercial services, the public library, etc., and offers the possibility of higher density housing. Because of its urban character and the flat terrain of the area, the streets adjacent to these existing and future uses are recommended for designation as Collectors (Urban-Downtown). The recommended Collector (Urban-Downtown) cross-section includes parking, a bike lane, and sidewalks for residents and visitors (see Figure 2-3).

Outside of the downtown area, three Collectors (Urban) will serve the city. The alternative standards for these facilities are shown below. Figure 2-3 shows the recommended alternative cross-section for Collectors (Urban).

Urban Collector



Urban Collector with Pathway



Urban Downtown Collector
4th Street, A Street and B Street

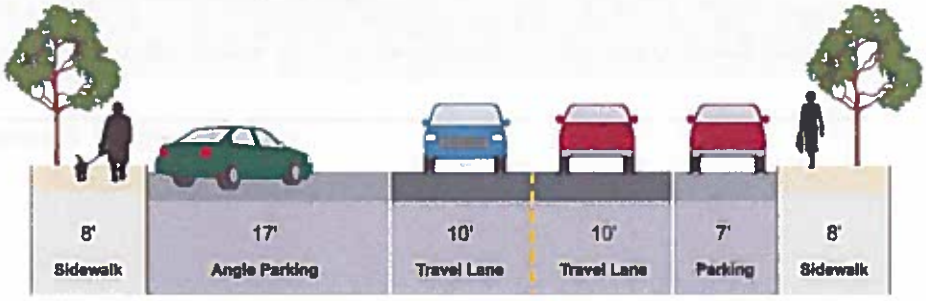


Figure 2-3. continued on next page...

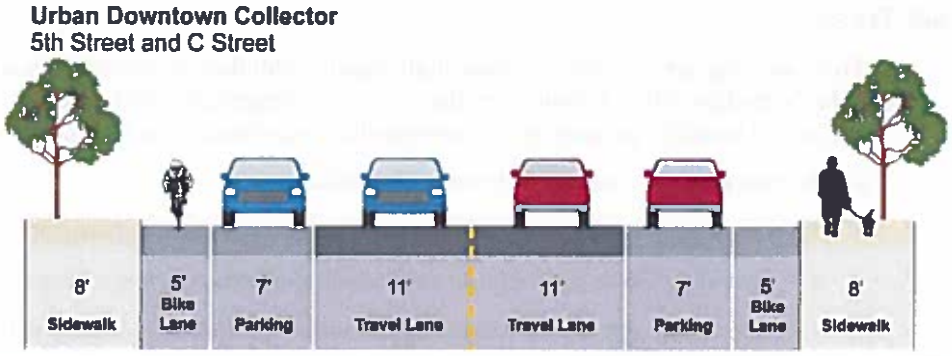


Figure 2-3. Collector Cross-Sections

Local Street

The local access streets in Bay City vary greatly in their current design, construction, and the number of units served. Some of the streets are largely unimproved and will remain in that state throughout the life of the Refinement Plan. Other streets are likely to be improved, extended, and generally reconstructed to be in compliance with the new standards shown below.

Two types of Local Street cross-sections are recommended for adoption, one with a sidewalk and one without (see Figure 2-4). While walking and cycling are supported by the City, there are some roadways with either very short lengths or topographical constraints. These facilities will not be reconstructed to include a sidewalk.

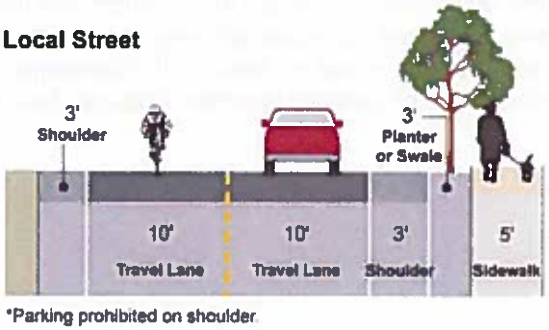


Figure 2-4. Local Street Cross-Section

Both recommended cross-sections for these local streets include two shoulders and two travel lanes, and the streets may be gravel or paved as required by the City. The road segments recommended for this designation have relatively little auto traffic. For street segments where the City allows parking and does not include a sidewalk, pedestrians would use both the shoulders and travel lanes. Where parking is prohibited, the street and shoulders could be narrower. Bicyclists on these road segments would share the travel lanes with vehicular traffic. The cross-sections will include design variances to accommodate unusual parcels and other constraints, based upon findings made by the City.

Street Trees

Trees are long-term, solar-powered, multi-tasking solutions to environmental concerns facing today's modern cities. Urban trees also provide commercial, psychological, social, and health and safety benefits, enhancing our communities and economy in a sustainable, effective way.

Street trees provide a variety of benefits, including:

- Improving water quality of rivers and streams by reducing erosion and runoff.
- Providing shade for trail users and cooling of streams, improving fish habitats.
- Improving the air by capturing pollution particles, reducing carbon dioxide, and producing oxygen.
- Providing food and shelter for wildlife.
- Reducing stress and crime levels in communities.

In addition to their aesthetic value, street trees can slow traffic and improve safety for pedestrians. Trees add visual interest to streets and narrow the street's visual corridor, which may cause drivers to slow down. Street trees should be appropriate for the desired streetscape and use. The recommendations on street trees have considered maintenance, massing, fruiting, and other characteristics of the possible tree types. Figure 2-5 shows how the size and crown shape of the urban street tree needs to allow for business advertising, views from upper windows, pedestrian mobility on the sidewalk, etc. Though native trees were sought for the downtown, the best options that have been identified are non-native species. However, on the local street system, where a larger tree can be accommodated, native trees have been recommended. At the third PAC meeting, there was additional interest expressed to include evergreen species. After further analysis, the massing and pruning issues have led the team to conclude that such trees (e.g., Port Orford cedars and noble firs) should instead be used as signature trees integrated into urban gateways and public parks. Such trees can not readily be integrated with the downtown or residential streetscapes. Figure 2-6 shows photographs of the recommended street trees and provides a general description for each.

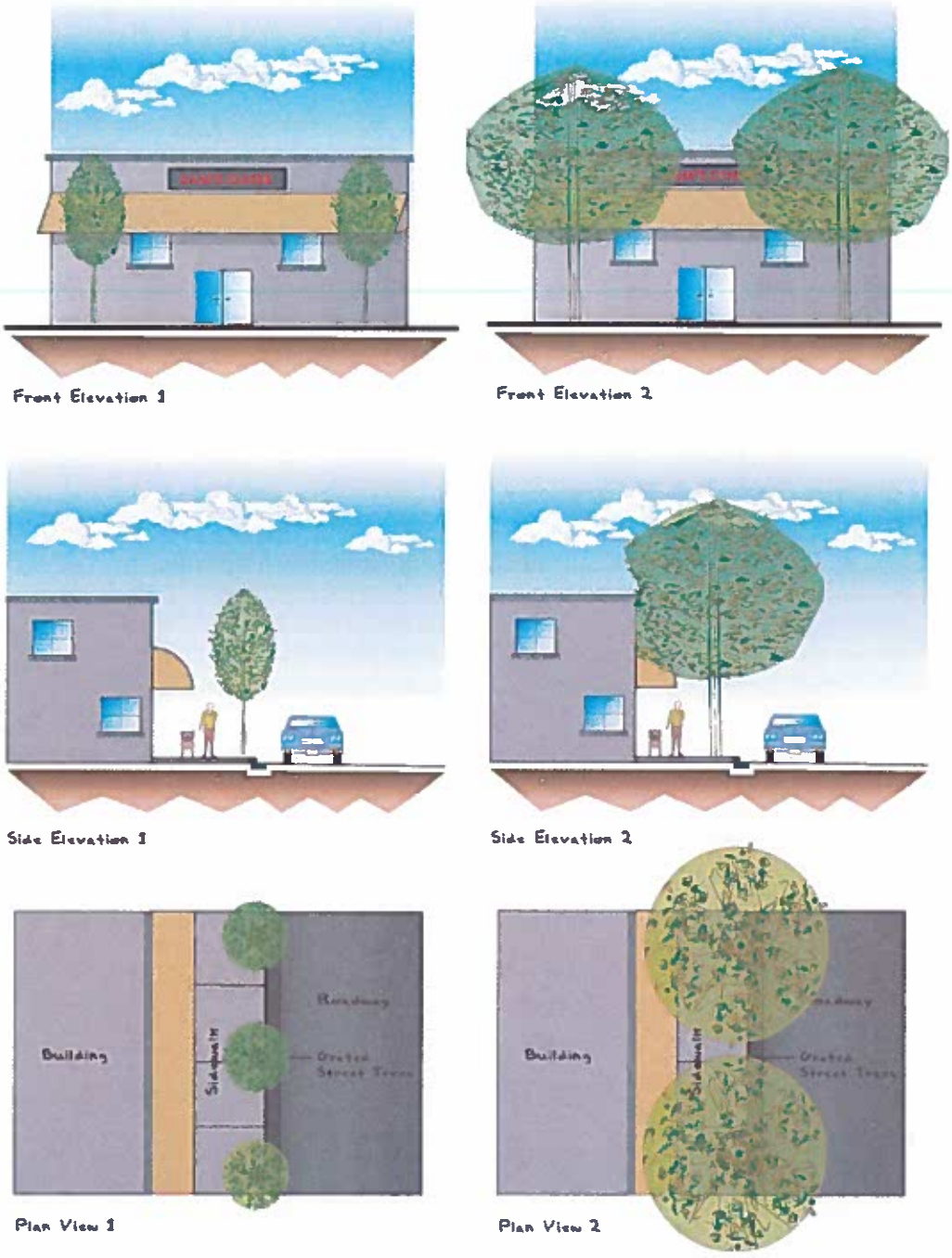


Figure 2-5. Urban Street Tree Characteristics

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Bioswale/Open Area Tree Options:

Amelanchier grandiflora - Serviceberry

Fraxinus latifolia - Oregon Ash

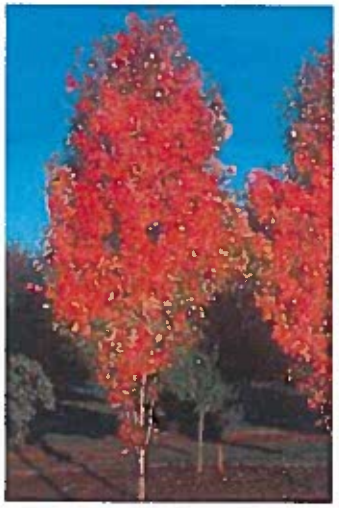
Cornus nuttalli - Pacific Dogwood

Characteristics:

The examples listed within this group are Northwest natives with known tolerance to damp and wet soil conditions as well as occasional flooding. The mature size and habit of these trees lends themselves to the open space of informal landscapes and areas where environmental constraints are less of aconcern for the tree. While these trees are widely adaptable to a variety of exposures and soil types, they do not possess the growth habit or drought tolerance characteristics that would make them compatible with the demands of an urban environment.

Height Range: 25 - 50' approx.
Spread: 25 - 30' approx.

Downtown/Confined Area Tree Options:



Acer rubrum 'Bowhall' - 'Bowhall Maple

Fagus sylvatica 'Fastigiata' - Fastigiate Beech

Prunus serrulata 'Amanogawa' - 'Amanogawa' Cherry

Characteristics:

The examples listed within this group are naturalized or ornamental trees selected for primarily their aesthetic qualities and tolerance to built environment conditions. The form of these trees can be considered as columnar or upright. As these trees continue to mature, their growth tends to be biased toward height rather than spread. These types of trees are an excellent addtion to the urban environment where space considerations are of higher priority. These trees are well adapted to drought conditions and will require less care than their counterparts when planted in a similar environment.

Height Range: 25 - 35' approx.
Spread: 8 - 10' approx.

Figure 2-6.
Street Tree Photographs and Descriptions
Transportation Refinement Plan
Bay City, Oregon

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2.3 ADDITIONAL CODE AND POLICY CHANGES

Parking Requirements

The requirement for and development of unnecessary parking stalls costs money, squanders valuable urban land, increases stormwater runoff, and adversely impacts an area's character. The project team completed a review of the existing Bay City parking requirements and recommends the following changes. Section 3.5 of the Development ordinance addresses parking standards, and is recommended for amendment in the following ways:

- Reduce parking requirements for certain uses. After a review of the existing requirements, a modest reduction is recommended for retail uses, office, as well as eating and drinking establishments. These reductions should help reduce impervious surface construction and will help preserve the limited buildable space in Bay City.
- Reduce parking requirements in the downtown High Intensity zone. It is recommended that the types of businesses and housing downtown will have lower trip-generation rates and lower parking requirements. This is the result of the higher density, walkable design of the downtown and surrounding areas. Therefore, it is recommended that businesses in this area be allowed an additional reduction in required parking (perhaps a 30 percent reduction) and that shared use agreement s be accepted as spaces so long as the shared spaces are within 500 feet.
- The City is considering the installation of a Common Parking Facility and considering providing spaces in that facility for purchase in lieu of providing on-site parking.

Additionally, the City is encouraged to adopt a maximum parking requirement at 130 percent of the required minimum with variances granted by the City Engineer.

Changes in the requirements and design of bicycle parking are also important and will be addressed in the next section of this technical memorandum.

Shadow Platting

The City has requested a new code provision to address shadow platting. Shadow Platting allows for future development to be considered in site design and will reduce the likelihood that design decisions confound future development. For example, on a 4 acre lot, the developer, should site the home in a that future subdivisions and development can occur without removal of the first home and without introducing future problems for road connectivity.

If a parcel of land to be partitioned will create lots large enough to be subdivided again, the applicant would provide a hypothetical non-binding plan or "shadow plat" depicting possible future development of the resulting lots. A shadow plat would be required prior to any development of the parcel.

Building Heights Downtown

The desired, mixed use downtown development is inhibited by the existing building height requirements. Section 1.413 of the Development Ordinance allows only 24 feet in height with allowances up to 30 feet. It is recommended that this section be amendment to allow 36 foot building heights in the downtown High Intensity Zone.

2.4 KEY PEDESTRIAN AND BICYCLE POLICY RECOMMENDATIONS

The Oregon Transportation Planning Rule (TPR) requires that planning for a network of bicycle and pedestrian routes throughout the study area be included as a part of the Bay City Refinement Plan. The TPR also requires that, when developing the bicycle and pedestrian circulation plans, local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel needs in developed areas.

Two mechanisms will contribute to the development of the proposed bicycle and pedestrian system. The first is a revision to the existing roadway functional classification system (see Section 2.2) with road standards that include specific bicycle and pedestrian infrastructure requirements. The second is a list of transportation capital improvement projects as described in Chapter 6.) which would be constructed to be consistent with the recommended roadway functional classification system.

Comprehensive Plan Policy Changes

Development of a functional classification system for the City has taken into account the needs of cyclists and pedestrians. Please refer to the street cross-sections for more detail. The following items will incorporate improved bicycle and pedestrian planning into the Comprehensive Plan.

Recommended Revision to Comprehensive Plan Policy 2

Sidewalks and Bicycles

2. The Street Section of the Public Facilities Plan generally does not require sidewalks as part of street improvements. However, as traffic becomes heavier along City arterials and in the commercial areas, consideration should be given to the requirement of sidewalks. Sidewalks would be built as part of new public or private streets or land development. Street standards with sidewalks have been adopted by the City within the Public Works Standards.

The following recommended amendment provides policy support for trails and a gateway on US 101:

9. The City will consider future development of an off-street trail along Patterson Creek and development of a gateway concept for the entrance to Bay City as described in the Bay City Downtown Transportation Plan, Section 4, Preferred Alternatives.

The following recommended amendment provides policy support for pedestrian and cycling amenities:

10. As resources allow, the City will work to incorporate streetscape elements for pedestrian and bicycle friendly street design.

X. As resources allow, Urban Collectors should be reconstructed with sidewalks and bike lanes when and where appropriate consistent with Public Works Standards.

Bike Parking

In a nationwide Harris Poll, almost half the respondents stated that they would sometimes commute to work by bicycle, or commute more often, if there were showers, lockers, and secure bicycle storage at work. Cyclists' needs for bicycle parking range from simply a convenient piece of street furniture, to storage in a bicycle locker that affords weather, theft and vandalism protection, gear storage space, and 24-hour personal access. Most bicycles today cost $350 to over $2,000 and are one of the top stolen items in all communities, with

components and accessories being stolen even when a bicycle is securely locked. Theft can be a serious deterrent to riding, especially for low-income riders or those with particularly expensive or rare bicycles. Where a cyclist's needs falls on this spectrum is determined by several factors:

- Type of trip being made: whether or not the bicycle will be left unattended all day or just for a few minutes.
- Security of area: determined by the cyclist's perception.
- Value of the bicycle: the more a cyclist has invested in a bicycle, the more concern shown for theft protection or how prone a given area is to bicycle theft.
- Some potential commuting cyclists require shower, locker, and changing rooms at trip destinations. For those cyclists needing to dress more formally, travel longer distances, or cycle during wet or hot weather, the ability to shower and change clothing can be as critical as bicycle storage.
- Bicycle parking can be broadly defined as either short-term or long-term parking:
- Short-term parking: bicycle parking meant to accommodate visitors, customers, messengers, and others expected to depart within two hours. Requires approved standard racks, appropriate location and placement, and weather protection.
- Long-term parking: bicycle parking meant to accommodate employees, students, residents, commuters, and others expected to park more than two hours. This parking is to be provided in a secure, weather-protected manner and location.

Short-Term Bicycle Parking

Short-term bicycle facilities are intended to provide short-term bicycle parking, and include racks which permit the locking of the bicycle frame and one wheel to the rack and support the bicycle in a stable position without damage to wheels, frame, or components. Short-term bicycle parking is currently provided at no charge at most locations. Such facilities should continue to be free, as they provide minimal security, but encourage cycling and promote proper bicycle parking.

The following bicycle rack dimensions meet or exceed those recommended by the Oregon Bicycle and Pedestrian Plan. These standards should be utilized during the design of the downtown streetscape and with future private development.

Table 2-1gives detailed guidance on the location of bike parking in addition to the general information provided below, and Figure 2-7 and Figure 2-8 show the dimensions recommended for bike parking.

- Bicycle parking spaces should be at least 6 feet long and 2.5 feet wide, and overhead clearance for covered spaces should be at least 7 feet.
- A 5-foot aisle for bicycle maneuvering should be provided and maintained beside or between each row of bicycle parking.
- Bicycle racks or lockers should be securely anchored to the surface or structure.

Table 2-1. Bicycle Rack Placement Guidelines

Issue	Recommended Guidance
Minimum Rack Height	To increase visibility to pedestrians, racks should have a minimum height of 33 inches or be indicated or cordoned off by visible markers.
Signing	Where bicycle parking areas are not clearly visible to approaching cyclists, signs at least 12 inches square should direct them to the facility. The sign should give the name, phone number, and location of the person in charge of the facility, where applicable.
Lighting	Lighting of not less than 1-foot-candle illumination at ground level should be provided in all bicycle parking areas.
Frequency of Racks on Streets	In Bay City, at least one rack should be installed on each block downtown. This does not eliminate the inclusion of requests from the public which do not fall in these areas. Areas officially designated or used as bicycle routes may warrant the consideration of more racks. Other development in high intensity zones should also require bicycle parking
Location and Access	Access to facilities should be convenient; where access is by sidewalk or walkway, curb ramps should be provided where appropriate and ADA compliant. Parking facilities intended for employees should be located near the employee entrance, and those for customers or visitors near the main public entrances. Convenience should be balanced against the need for security if the employee entrance is not in a well-traveled area. Bicycle parking should be clustered in lots not to exceed 16 spaces each as large expanses of bicycle parking make it easier for thieves to operate undetected.
Locations within Buildings	Provide bike racks within 50 feet of the entrance. Where a security guard is present, provide racks behind or within view of a security guard. The location should be outside the normal flow of pedestrian traffic.
Locations Near Transit Stops	The downtown transit stop should utilize covered and open bike parking facilities to accommodate both short- and long-term cyclists.
Retrofit Program	In established locations, such as schools, employment centers, and shopping centers, the City should conduct bicycle parking audits to assess the bicycle parking availability and access, and provide additional bicycle racks where necessary.

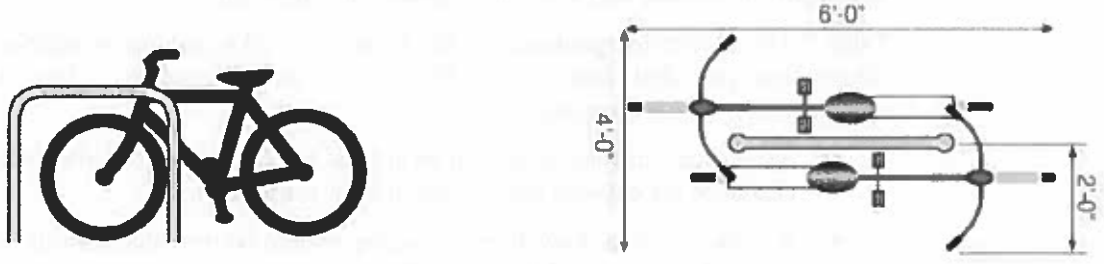
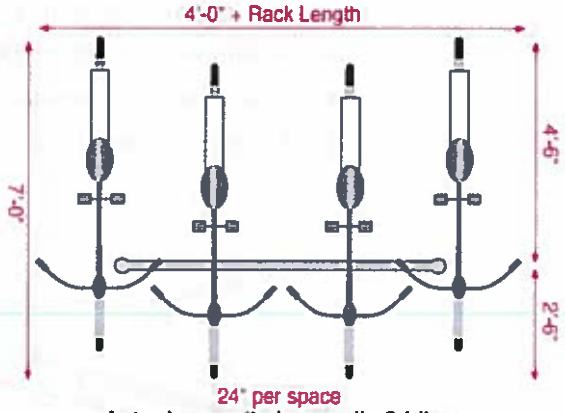


Figure 2-7. Inverted 'U' Rack/Stable Rack

Ribbon, Spiral, or Freestanding Racks
(with access from only one side)



Actual capacity is usually 3 bikes

Figure 2-8. Ribbon, Spiral, and Freestanding Racks

Where racks are not possible on sidewalks (because of narrow sidewalk width, sidewalk obstructions, or other issues), bicycle parking can be created in the street where on-street vehicle parking is allowed. Two possible options for creating parking in the street include clustered racks in a car parking space protected by bollards or curbs, and racks installed on sidewalk curb extensions where adequate sight distance can be provided. Installing bicycle parking directly in a car parking space incurs only the cost of the racks and bollards or other protective devices.

A curb extension is more expensive to install, and can be prohibitively expensive if substantial drainage and/or utility work is necessary. Costs may be less if the curb extension is installed as part of a larger street or pedestrian improvement project. On-street bicycle parking may be installed at intersection corners or at mid-block locations. Mid-block on-street parking may be closer to cyclists' destinations, although it could force cyclists to dismount and walk to the parking site if access from the street is difficult or dangerous. Combining a mid-block pedestrian crossing with mid-block on-street parking facilities could mitigate this situation.

Long-Term Bicycle Parking

Long-term bicycle parking provides employees, students, residents, commuters and others who generally stay at a site for several hours, a secure and weather-protected place to park and store bicycles. Long-term facilities protect the entire bicycle, its components, and accessories against theft and inclement weather, including snow and wind-driven rain. Examples include lockers, check-in facilities, monitored parking, restricted access parking, and personal storage.

Long-term parking facilities are more expensive to provide than short-term facilities, but are also significantly more secure. Although many bicycle commuters would be willing to pay a nominal fee to guarantee the safety of their bicycle, long-term bicycle parking should be free wherever automobile parking is free. Potential locations for long-term bicycle parking include large employers and institutions where people use their bikes for commuting, and not consistently throughout the day. An advantage of lockers is that they can be configured to more easily accommodate different styles of bicycles, such as recumbent bicycles (see Figure 2-9).

Security can be achieved in at lease one of the following ways:

- In a locked room or area enclosed by a fence with a locked gate;
- Within view or within 100 feet of an attendant or security guard;
- In an area that is monitored by a security camera; or
- In a location that is visible from employee work areas.

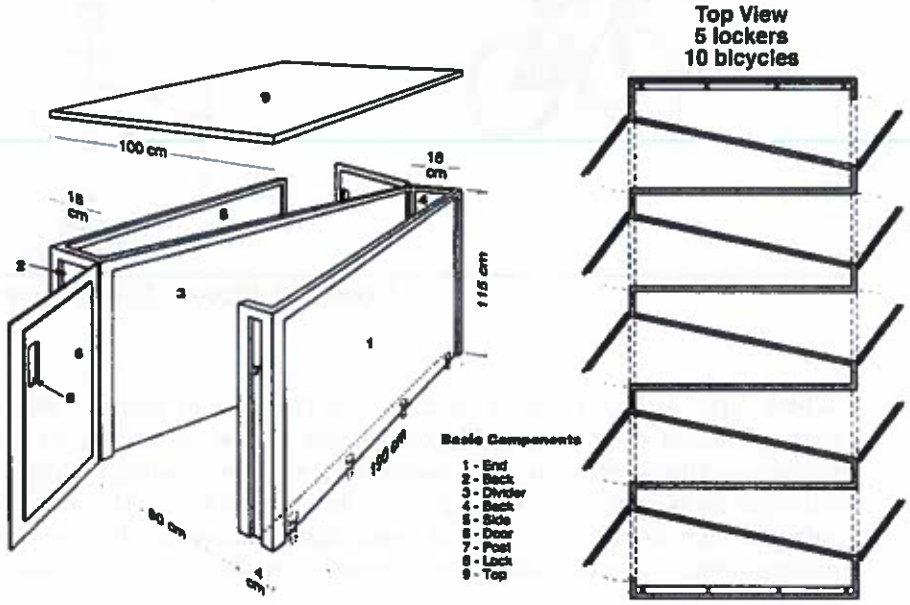


Figure 2-9. Bicycle Lockers

Bike Rack – Art Design Competition

Several cities and organizations have sponsored bike rack design competitions to develop functional sculptures that provide bicycle parking locations. A small cash prize is often offered. These artistic racks add personality and a sense of place to a sidewalk or commercial area. Having public amenities contribute to a sense of place is critical, especially in Bay City's downtown. It is recommended that Bay City partner with a nearby school to generate ideas for a local bike rack design. At the very least, the City should select a single design, to be used consistently. Figure 2-10 provides additional examples of bike amenities.

Figure 2-10. Bicycle Rack Designs

3. FINANCING OF PUBLIC PROJECTS

3.1 REVENUE FORECAST

Slightly more than **$23,000** dollars of public funding per year will have been spent from 1998 through 2008 on transportation projects in Bay City. For the purposes of estimating future public funds available for transportation projects, these historic data were used to develop a 20 year projection in 2008 dollars. Table 3-1 shows the 10-year project financing history indicates a potential, without changes to City code or staffing, that would provide slightly less than half a million dollars in funds ($465,308.00). Recommendations on the establishment of a Transportation System Development Charge and a road district will show a potential for increased revenues.

Table 3-1. History of Transportation Finance

Year	Project	Tax Plat Map	Source	Cost
1998	Trade Street from 4th to 2nd	1N 10W 34DA to 1N 10W 34DB	SCA Grant	$10,280
1999				
2000				
2001	15th Street from Tillamook Avenue to Baseline Road	1S 10W 2BA	SCA Grant	$23,965
2002	4th Street from Hobsonville Road to Main Street	1N 10W 34AD to 1N 10W 34DA	Tillamook County	Unknown
2003	5th Street from Main Street to Portland Avenue	1N 10W 34DA to 1N 10W 34DD	Tillamook County	
2004	18th Street from Williams Avenue to termination (one block)	1S 10W 2CA	SCA Grant	$12,871
2004	19th Street from Williams Avenue to termination (one block)	1S 10W 2CA	SCA Grant	$12,086
2005				
2006	A Street from 4th to 5th;	1N 10W 34DD	SCA Grant	$27,757
2006	B Street from 4th to 5th;	1N 10W 34DD		
2006	C Street (Hayes Oyster) from 4th to 5th	1N 10W 34DD		
2006	Ocean Street from 5th to 7th	1N 10W 34DA	City	13,600
2006	Seattle Street from 11th to 13th	1S 10W 2BB	City	12,750
2006	13th Street from Seattle to Tillamook	1S 10W 2BB	City	$11,040
2007				
2008	E Street from 12th to 14th	1N 10W 35CC	SCA Grant	$25,000
2008	14th Street from E Street to Baseline Road	Tax Plat Map 1N 10W 35CC; 1S 10W 2BA; 1S 10W 2BB		
2008	Baseline Road from 14th to Bewleys Street	1N 10W 35CC; 1S 10W 2BA; 1S 10W 2BB	City	$43,305

Year	Project	Tax Plat Map	Source	Cost
	10 Year History	SCA Total		$111,959
		County (estimate)		$40,000
		City Total		$80,695
	Annual Average	SCA		$11,196
		County		$4,000
		City		$8,070
		Total		$23,265
	Projection for 20-Year Plan			$465,308

3.2 ESTIMATED FUTURE PUBLIC TRANSPORTATION REVENUE

As discussed in Chapter 3, approximately $23,000 dollars of public funding per year will have been spent from 1998 through 2008 on transportation projects in Bay City. While available documentation indicated a few of the levels of government (City, County, or State) that provided the public funds, the specific programs associated with those funds were not consistently identified. Included below is a discussion of the most readily available sources of transportation funding for cities in Oregon. The City of Bay City should seek to familiarize themselves with programs they haven't used in the past to ensure they are maximizing funds available to complete priority projects.

3.3 STATE AND FEDERAL FUNDING

Federal Surface Transportation Program/State Highway Funding

As the recipient and distributor of Federal Highway Administration (FHWA) funding, ODOT is the primary distributor of federal and state transportation funding. ODOT allocates funding through updates to the Statewide Transportation Improvement Program (STIP). Projects selected for inclusion in the STIP must be consistent with the goals and objectives of the Oregon Transportation Plan, and its modal plans for highways, public transportation, freight and passenger rail, and bicycle and pedestrian facilities. Eligible projects are usually selected from a list of prioritized improvements, such as those included in the Bay City Transportation Plan and other related refinement plans or studies. Input and testimony from the general public and local government representatives play an important role in getting specific projects on the STIP.

STIP project costs will likely be subject to escalation to reflect rising material costs (such as oil and steel). The combined result of fixed federal/state funding allocations and annual project cost escalation means fewer improvements can be implemented over time. It should be noted that the state has begun to require contributions from local jurisdictions for some projects when development has significant traffic impacts. An example of this is the improvement on US 101 near Lincoln City. Sharing may become more common if federal funds decrease in the future. It is expected that local contribution to or cost sharing for projects such as interchanges and bridges will continue.

The paragraphs below summarize some of the specific federal/state programs that could be useful in Bay City.

Special Small City Allotment

ODOT administers the Special Small City Allotment (SCA) program that currently provides funding of up to $25,000 to cities with populations of fewer than 5,000 permanent residents. The SCA funds are from the state gas tax, and may be used to fund improvements to a city's local transportation system. The city of Bay City has been successful in utilizing SCA funds in the past.

State Motor Vehicle Fund

The State of Oregon collects gas taxes, vehicle registration fees, overweight/overheight fines and weight/mile taxes and distributes a portion of these revenues to counties and cities using an allocation formula. The State distributes a local share to cities based on a per capita rate. Revenues vary from year to year as the allocation formula can vary. Funds can be used for capital improvements or maintenance. While the gas tax provides needed transportation system revenue, it is unlikely to keep pace with future maintenance needs. Over time fuel efficiency and the appearance of hybrid or mixed-fuel vehicles offset the future purchasing power of the gas tax.

Special Public Works Fund and Immediate Opportunity Fund

The Special Public Works Fund (loans and grants) and Immediate Opportunity Fund (grants) provides funding for public works that encourage economic and community development, such as supporting private projects resulting in creation or retention of permanent jobs. Loans that are provided through the Special Public Works Fund are typically available at below market rates.

Oregon Transportation Infrastructure Bank

The Oregon Transportation Infrastructure Bank (OTIB) is a statewide revolving fund available to local governments to provide long-term (up to 30 years), low-interest loans designed to promote innovative transportation funding solutions. Projects must be federal-aid eligible. OTIB funds can be spent on engineering, environmental permitting, right-of-way, construction, and project management. Applications are accepted on an ongoing basis.

Oregon Immediate Opportunity Fund

The Immediate Opportunity Fund program, managed by ODOT and the Oregon Department of Economic and Community Development (OECDD), provides a maximum of $500,000 for public road work associated with an economic development related project of regional significance, provided the project creates primary employment. Additionally, although lesser shares will be considered, the grantee should provide an equal local match.

Bicycle and Pedestrian Grant Program

The State Bicycle and Pedestrian Grant Program provides funds for highways, county roads, and local streets where improvements are needed for pedestrians and/or bicyclists. Eligible project types include: Americans with Disabilities Act (ADA) upgrades; completing short sections of missing sidewalks or bike lanes; street crossing improvements; intersection improvements; and minor widening for bike lanes or shoulders.

Community Development Block Grants

The federal Department of Housing and Urban Development administers the Community Development Block Grant (CDBG) program. Funds are allocated based on city size and demographics, such as income levels and housing standards. In some communities, street reconstruction projects in older neighborhoods have been funded by this program. Many other cities use these funds to provide or improve the sidewalk system in older neighborhoods, particularly in the vicinity of schools. CDBGs are extremely beneficial; however, the management and paperwork that precedes and accompanies a CDBG can be intensive and expensive, making it prohibitive for rural areas with limited resources and experience. Grant administration is paid with CDBG administration funds, county or city funds, and/or a combination. The Economic Development Council of Tillamook County houses a certified grant manager to assist communities who have been awarded CDBGs or other grants.

3.4 LOCAL FUNDING

The paragraphs below summarize local options for funding projects in Bay City.

City Gas Tax

The City could levy a per gallon tax on fuel sold in Bay City. Typical taxes range from $0.01 to 0.03 per gallon. Woodburn, Tillamook, and The Dalles are examples of communities that have used such a tax. The City could contract with the State Fuel Tax Branch to collect and administer the tax. However, the city currently has only one filling station in town at the Tillamook Country Smoker Factory Outlet and competing stations in nearby towns, a market assessment of the impacts of a gas tax should be considered before this concept is forwarded to a vote.

Local Vehicle Registration Fee

This would operate similarly to the existing statewide system. Although the method has been discussed, no City or county governments have implemented such a program.

Local Property Tax Levies/Street Bonds

This method is typically used to fund road improvements that will benefit an entire community. General obligation bonds are supported by a property tax levy on assessed value of property. This method requires voter approval of bond issues and, because of the high costs of bond underwriting, is not usually viable for funding single projects that cost less than $2,000,000.

Local Improvement Districts

Local Improvement Districts (LIDs) levy special assessment charges on property owners within a defined area such as a neighborhood, street frontage or industrial/commercial district, with each property assessed a portion of total project cost. LIDs are commonly used for street paving, drainage, parking facilities and sewer lines. The justification for such levies is that many of these public works improvements provide a direct benefit or enhancement to the value of nearby land, thereby providing direct financial benefits to its owners. LIDs are typically used for local street projects that cannot be funded through other means. State law and city code govern the formation of LIDs, the assessment methodology, and other factors.

LIDs are usually funded by the participants, but may also be combined with other funding sources to leverage all available resources. LIDs can be initiated by property owners or the City, and the collected funds are commonly used to repay debt on bonds incurred to undertake the infrastructure improvements. These bonds are guaranteed by payments from the affected properties through a property lien that sunsets when the LID share is paid off. LIDs typically require at least 51 percent of the affected properties to approve the LID. Costs can be determined based on road frontage or square footage.

Reimbursement District or Zone of Benefit District

Public or private entities that build road systems can be compensated by future property owners at a proportional rate, as development occurs. Usually limited to private construction of roads, this mechanism can be useful for public/private developments. Implementation of these districts requires local legislative action. Bay City Ordinance No. 576 addresses this funding mechanism and provides procedures for Cost Reimbursement (Section 7).

Road User, or Street Utility, Fees

This method would charge city residents and nonresidential users a monthly or yearly fee for use of the city road system, similar to water and sewer utility fees. User fees go to maintenance activities and have been instituted in a number of communities. The City of Medford's Transportation System Plan, for example, recommends that the Medford user fee generate over $100 million over the 20-year life of the plan. A fee of this type would free up other local transportation dollars (such as gas tax receipts) to be used for constructing transportation projects. Bay City Ordinance No. 602 established a *street maintenance fee* which is managed in a Street Maintenance Fund. The fee (of only $5 per house per month) provides little revenue for improvements. An additional shortcoming of the program is that it only generates revenue from built properties, and is unable to generate funds from vacant parcels. During the first town hall meeting and the subsequent PAC meeting, there was direction provided that if a road district could be established, it would likely supplant the street maintenance fee and program.

Road District

Members of the PAC have asked about the potential for establishing a roads district. The district would function as a tax base and revenue generating mechanism much like the special districts established for fire service, libraries, etc. Oregon statutes authorize and outline the formation of general districts, special road districts, and road assessment districts. The purpose of these various districts has been to facilitate the construction and improvement of roads.

Under the general road district system, which continues to function in a few counties, the county governing body and the county road official have the responsibility for the road program. Special road districts have independent operating boards but may utilize the county organization to provide its services. The road assessment district was designed specifically for Malheur County and is used only there. However, Washington County has established a county service district for urban road maintenance purposes.

Road districts may be created under Oregon Revised Statutes (ORS) 371.055 to 371.110 for the purpose of improving county roads and, within a city or drainage district, public roads. These road districts are commonly referred to as county road districts or general road districts to distinguish them from the more specialized road districts provided by other statutes. A county road district could apparently be superimposed over a part of a county as a means of levying a property tax for roads in addition to any overall county road levy. However, the

historical experience has been that a county road district system is applied county-wide and replaces any county road levy program. Incorporated cities and certain drainage districts and islands are automatically separate road districts. Bay City would establish its own road district.

Road improvements within a district may be initiated by a petition of the resident freeholders of the road district. Then, with approval from the City, an investigation is made and a report is submitted to either County or City decision making bodies. Each year, a road district may assess, levy, and collect an ad valorem tax on all district property. In 1997, voters approved Measure 50 to amend the citizen initiative, Measure 47, passed in November 1996. Measure 50 combined each taxing body's operating levies into a single levy, reduced that levy, and converted the levy into a permanent tax rate for the jurisdiction.

In addition, Measure 50 created a new type of levy known as the local option levy. Local option levies are operating levies that can be passed by local governments to raise revenue beyond the permanent rate amounts. All moneys collected shall be credited to a special fund in the county treasury and they may be expended under the supervision of the county court. Incorporated city road districts can have their funds paid over to the city and expended under the supervision of the city. Measure 50 converted each taxing body's property tax levy into a permanent tax rate for property tax purposes and limited the ability of taxing bodies to impose additional property taxes for operating purposes to voter-approved local option levies.

Once authorized by voters in the district, the board may levy a road tax of up to one-fourth of one percent (0.0025) of the real market value of the property within the district. An additional one-fourth of one percent (0.0025) may be levied in any year by separate voter approval for that year's levy.

Applicability of a Road District

Additional research is being conducted to understand the potential for road district in Bay City and the complications which will arise from the Measures 5 and 50 limitations. Technical Memorandum #3 will provide further direction on this potential financing tool. Road assessment districts may be formed under ORS 371.405 to 371.535 only in counties with a population between 19,000 and 25,000 at the time of formation. Subsequent growth to a population exceeding 25,000 has no effect on a properly formed district.

> ORS 371.410: Formation of road assessment district in counties with 19,000 to 25,000 population; effect of population increase. (1) A road assessment district may be formed in any county having a population of 19,000 and not more than 25,000, as shown by the decennial federal census, and shall consist of an area of more than 20,000 acres or an assessed valuation of taxable property of not less than $1 million, according to the last county assessment roll. A road assessment district may be formed to provide for the improvement, repair or reconstruction of the public roads within such area of land.

Tillamook County's population, as reported in the 2000 U.S. Census Bureau estimates, was 24,262 persons. The Bureau's current estimate is 25,038. So, the County would appear to qualify based on population. The district must have at least 20,000 acres or $1 million assessed valuation of taxable property. Tillamook County qualifies on both accounts.

Transportation System Development Charges

Transportation System Development Charges (SDCs) are fees paid by land developers to cover a portion of the increased system capacity needed to accommodate new development. Development charges are calculated to include the costs of impacts on services, such as increased school enrollment, parks and recreation use, or traffic congestion. A Transportation SDC is a one-time fee charged to new development that helps pay the costs of building transportation infrastructure (for example, roads or sidewalks) to support the overall transportation system. The City of Bay City's does not currently utilize any Transportation SDC financing mechanisms.

There are two types of Transportation SDCs that local governments may adopt: a reimbursement fee that requires new development to pay for their share of the existing transportation system that they will use and, an improvement fee which requires new development to pay for their share of future transportation projects that are needed to accommodate growth. ORS 223.297–223.314 allow local governments to adopt one or both types of Transportation SDC fees, and regulates the process for establishing Transportation SDCs and defines the type of transportation projects that may be built with Transportation SDC funds.

The City of Bay City could adopt an improvement fee Transportation SDC. Transportation SDC fees would be collected on new development in Bay City, calculated based on equivalent dwelling units (EDUs), with the number of trips generated by a new single family home equaling one (1) EDU. The Institute of Traffic Engineers (ITE) has produced a Trip Generation Manual which estimates the number of trips different types of development (for example, restaurants, light industrial manufacturers, etc.) produce (ITE 2008). For fee assessment purposes, the number of trips a development produces is used to calculate its EDU number and Transportation SDC fee. The Transportation SDC rate for new development within Bay City would need to be calculated based on the final, adopted Improvement Project costs, and an assessment of future land use patterns and rates.

Step 1: Determine EDUs

Technical Memorandum #1 included a process for determining expected future growth in EDUs. Though the estimate was a legally defensible approach that meets the requirements of ORS 223.297–223.314, a more precise measurement of expected EDU growth is possible and is recommended for Bay City's Transportation SDC. An inventory of developable land within Bay City's (UGB) was developed in Technical Memorandum #1. This inventory was used to estimate the number of future trips expected to result from new development by 2030.

The Comprehensive Plan, adopted in 1978 and amended through 2007, generally supports a quiet residential nature for Bay City. It recommends that new development be limited. The plan also speaks to a high quality of life and natural resource protection. The population and employment projections described in Technical Memorandum #1 are shown in Table 3-2. There were 185 new residential units projected for the next 20 years as well as three new restaurants, a bank, five retail/service businesses, and a small hotel. The data presented in Table 3-2 is based on rough estimates from the ITE Trip Generation Manual (ITE 2008); however, these only provide rough estimates. The different types of residential construction, different types of restaurants, etc. have potentially significant trip generation rates.

Table 3-2. Population and Employment Projections

Land Use Type (New Development)	Trip Generation/ Unit	Unit	Number of Units	Expected New trips (2030)	Expected New EDU's (2030)
Residential (Single-Family Detached Household)	9.57	per household	185	1770.45	185
Restaurants	89.95	per 1,000 sq ft	3	269.85	28
1 Bank/Credit Union	156.48	per 1,000 sq ft	1.5	234.72	25
5 Retail or Service Businesses	44.32	per 1,000 sq ft	9	398.88	42
Hotel	8.92	per occupied room	35	312.2	33
Total				**2986.1**	**312**

According to these initial estimates, there is expected to be a total of 2,986 trips generated by new development in Bay City. Of these, 1,770 would be residential and 1,216 would be non-residential. The expected increase by EDU is 312.

Step 2: Determine Cost of Infrastructure

Improvement Fee Cost Basis

Bay City's possible improvement fee would be based on a list of transportation projects needed to provide capacity for future development through 2030. As the Refinement Plan will include a new list of needed transportation projects to serve growth through 2030, it will be necessary to calculate an improvement fee cost basis to reflect these new costs. This memorandum includes a proposed project list with associated costs which will be updated with input from the PAC, the City Council, and the public. The list below is based on early technical analysis and the outcomes of the first town hall meeting and the first three PAC meetings. As projected growth will be approximately 30 percent of the total travel demand in 2030, 30 percent has been used in these early calculations. Table 3-3 shows that the draft project list has a total cost of roughly $7,500,000, which is likely to change before the adoption of the Final Transportation Refinement Plan. The private share of such is projected to be $2,278,500.

Table 3-3. Draft Project Cost Estimates

Project	Draft Cost Estimate	Private Share Estimate (30%)	Public Share Estimate (70%)
Redesign of Warren and US 101	$350,000	$105,000	$245,000
Redesign of Hayes Oyster and US 101	$325,000	$97,500	$227,500
Downtown streetscape	$2,500,000	$750,000	$1,750,000
Traffic calming on Williams and 16th	$9,000	$2,700	$6,300
Traffic calming on 4th	$8,000	$2,400	$5,600
Traffic calming at 5th and Hayes Oyster	$3,000	$900	$2,100
Pathway along rail road	$900,000	$270,000	$630,000

Project	Draft Cost Estimate	Private Share Estimate (30%)	Public Share Estimate (70%)
Pedestrian bridge at Hayes Oyster	$3,500,000	$1,050,000	$2,450,000
Fifth Street Intersection with US Highway 101	Not yet available	Not yet available	Not yet available
Total[1]	**$7,595,000**	**$2,278,500**	**$5,316,500**

Step 3: Determine the Transportation SDC Fee

As stated above, once the number of future trips (capacity basis) and infrastructure costs (cost basis) are known, the maximum imposable Transportation SDC fee is obtained by dividing the cost basis by the capacity basis. Though the City may charge the maximum Transportation SDC fees possible, the City may also choose to charge a lower fee per EDU.

The total private share of the draft list of capacity improvement projects is over $2,000,000. With only 312 EDUs in projected growth, this private share would be divided among a relatively low number of property owners/ developments. The cost of each EDU is $7,302.88. An SDC of this amount in a rather small community such as Bay City may be problematic both in its adoption and in its impact on future development decisions. An additional $7,000 per household will significantly impact the return analyses of development proposals. As part of the Transportation Refinement Plan process, the project team will help to determine an appropriate level of SDC charges and forward such a recommendation to the Bay City Planning Commission and City Council.'

3.5 GRANT OPPORTUNITIES FOR OFF-ROAD TRAILS AND RAILS-TO-TRAILS PROJECT

The Bay City Refinement Plan PAC has identified a need for the completion of three major trail projects. The first project (a pathway along the railroad) is the only one of the three to be included in the transportation plan. The completion of the Jacoby Creek and Patterson Creek trails have been determined to be primarily recreation and parks projects and will not be considered in the financial evaluation of the transportation system. However, the project team has assembled information on potential funding sources for these projects as well as the Rails-to-Trails project.

National Scenic Byways Grant Program

Transportation enhancement grants are often used to fund trails. If the trail is associated with a scenic byway (US 101 is a designated All-American Road), then it would be eligible to compete for funding under the National Scenic Byways discretionary grant program.

Recreational Trail Grants

Recreational Trails Grants are national grants administered by the Oregon Parks and Recreation District (OPRD) for recreational trail-related projects such as hiking, running, bicycling, off-road motorcycling, and all-terrain vehicle riding. Yearly grants are awarded based on funds voted on by the U.S. Congress.

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[1] Not including costs of improvements at 5th and Portland

Land and Water Conservation Fund

The Land and Water Conservation Fund (LWCF) program is managed by the National Park Service but administered in each state through a state agency responsible to the NPS. LWCF grants require a 50 percent match from state or local funds. Eligible applicants include Cities, Counties, and recreation and park districts authorized to provide public park and recreation facilities. Lands and facilities funded through LWCF grant assistance are required to be dedicated in perpetuity for public recreation.

Oregon Bicycle and Pedestrian Program

The Oregon State legislature generally requires the inclusion of facilities for pedestrians and bicyclists wherever a road, street, or highway is built or rebuilt. They also require ODOT, Cities, and Counties to spend reasonable amounts of their share of the state highway fund on facilities for pedestrians and bicyclists. These facilities must be located within the right-of-way of public roads, streets, or highways open to motor vehicle traffic. The funds cannot be spent on trails in parks or other areas outside of a road, street, or highway right-of-way. The rail-to-trail conversion would be an appropriate use of these funds. The law requires that in any given fiscal year, the amounts expended to provide walkways and bikeways must be a minimum of 1 percent of the state highway funds received.

Oregon State Lottery

Oregon voters passed an initiative in 1998 authorizing a percentage of state lottery money to be dedicated to an acquisition and development grant program for outdoor parks and recreation projects. The Local Government Grants program, managed by OPRD, gives more than $4 million annually.

4. ROADWAY SYSTEM IMPROVEMENTS

This section identifies and evaluates potential transportation improvements designed to meet existing and future transportation needs for those who live, work, recreate, and travel through Bay City. The project evaluation process included the identification of potential environmental constraints within the city which might affect the design and feasibility of the projects.

4.1 RECOMMENDED ROADWAY IMPROVEMENTS

The City should develop, adopt, and use in planning a future transportation plan. As shown on Figure 4-1, this plan can be consist of a simple map of future roadways and a list of necessary improvement projects. These will be developed as part of this Refinement Plan effort and adopted therewith.

Technical Memorandum #1 included an analysis of future traffic operations at key intersections for the planning horizon year of 2030. A Synchro traffic simulation model was developed specifically for the study area intersections and included field-verified geometrics and other relevant physical data for each intersection. Analysis procedures followed guidelines in the ODOT Transportation Planning and Analysis Unit (TPAU). The results of the analysis indicated that all but one of the intersections would meet the minimum standard of acceptable operation through 2030. The exception was at Warren Street and US 101, where analysis revealed the need for a left-turn pocket for northbound travelers. The City has also identified a strong desire for a number of transportation projects that will require future analysis.

The recommended roadway projects include:

1. Redesign of the Warren Street/US 101 intersection aligning the roadways and providing a left-turn pocket both on the southbound and northbound approaches.
2. Redesign of the Hayes Oyster Drive/US 101 intersection aligning the roadways and providing a left-turn pocket both on the southbound and northbound approaches.
3. A secondary egress from the "Goose Point" area west of US 101 and accessed by Warren Street.
4. Downtown Streetscape, improvements consistent with the Downtown Transportation System Plan.

At the Bay City Refinement Plan town hall meeting, a number of possible designs for these projects were considered and evaluated. The findings have been included below, along with other considerations for these locations.

Warren Street and US 101

The approaches of Warren Street to US 101 form an offset intersection. A realignment of the intersections may be considered to improve function and safety. A northbound left turn lane is warranted. The improvement will encourage connectivity and provide for a pedestrian crossing of US 101. Figure 4-2 shows a draft improvement concept for the redesign of Warren Street and US 101.

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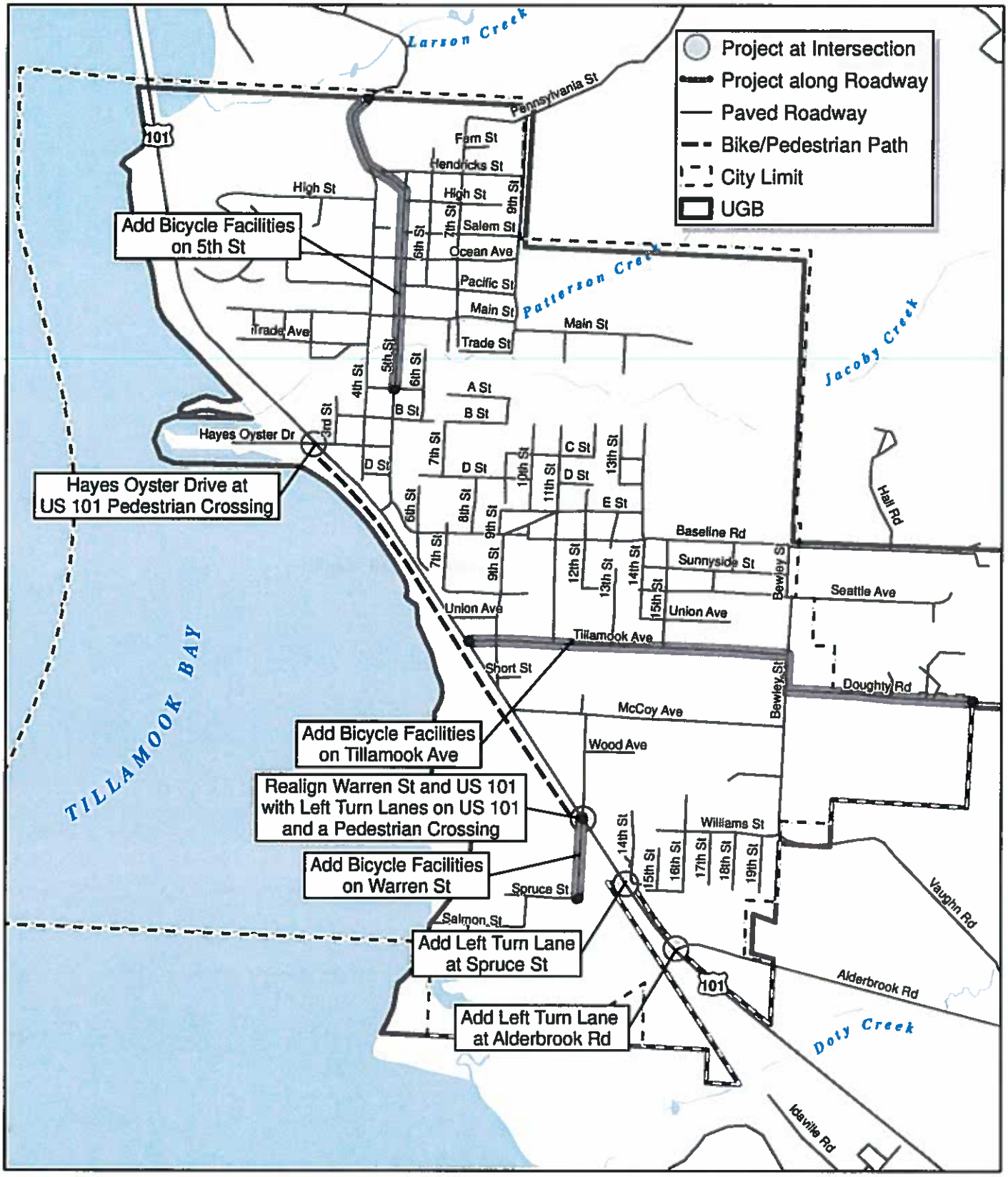

Figure 4-1.
Transportation and Roadway Projects

Transportation Refinement Plan
Bay City, Oregon

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DATE: Mar 04, 2009 FILE: BayCity_01

LEGEND

- MEDIAN CURB
- EDGE OF PAVEMENT
- STRIPPING

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Figure 4-2.
Warren Street at US 101
Draft Improvement Concept
Bay City, Oregon

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Hayes Oyster Drive and US 101

The approaches of Hayes Oyster Drive to US 101 form an off-set intersection. A realignment of the intersections may be considered to improve function and safety. Left turn lanes are warranted. The improvement will encourage connectivity and provide for a pedestrian crossing of US 101. Figure 4-3 and Figure 4-4 shows a draft improvement concept for the redesign of Hayes Oyster Drive and US 101.

Goose Point Egress

Options for a secondary egress from the Goose Point area include emergency access to the proposed pedestrian facility along the railroad right-of-way. This multi-use path could be designed to accommodate a single lane of vehicles, and could have access controls that would only allow for use of the facility (by vehicles) during emergencies. While this would enable consistency with state fire codes, it would not allow for tsunami-related evacuations in a manner that would allow quick evacuation of the coast. In order to accomplish both emergency egress goals, a new route to US 101 would be needed. Early discussion of this possibility have not yet produced an agreed upon solution. TPAU has expressed some concern about providing new access to US 101 that is not consistent with adopted spacing standards.

Downtown Streetscape

A previous ODOT/DLCD grant was awarded to the City for the completion of a Downtown Transportation Plan. The Plan was completed in 2003 but was not adopted. The findings and recommendations in the plan are recommended for this Refinement Plan. Recommendations from the Downtown Transportation Plan included the following new polices, street cross-sections, gateways, and more.

4.2 TRAFFIC CALMING

When our streets are safe and pleasant, the quality of life is enhanced. When traffic problems become a daily occurrence, they threaten our sense of community and personal well-being. Traffic calming (also called traffic management) refers to various design features and strategies intended to reduce vehicle traffic speeds and volumes on a particular roadway. Traffic calming projects can range from minor modifications of an individual street to comprehensive redesign of a road network. Traffic calming is becoming increasingly accepted by transportation professional organizations and urban planners.

Traffic calming interventions slow traffic by modifying the physical environment of a street. As shown in Table 4-1, there are a variety of traffic calming measures are available. In addition, speed limit reductions may be effective at reducing speeds, with or without physical traffic calming improvements.

Research into the effectiveness of traffic calming devices to improve pedestrian safety has shown that traffic calming can reduce the number of automobile collisions. A Vancouver study published in 1997 showed an average collision reduction of 40 percent in four neighborhoods that used a combination of the traffic calming types described below. Consultation with Public Works and public safety agencies (e.g., fire and medical services) should occur prior to the installation of traffic calming improvements.

Figure 4-5 illustrates examples of traffic calming applications on a hypothetical street.

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LEGEND

- MEDIAN CURB
- EDGE OF PAVEMENT
- STRIPPING

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Figure 4-3.
Hayes-Oyster Drive at US 101
Draft Improvement Concept – Option 1
Bay City, Oregon

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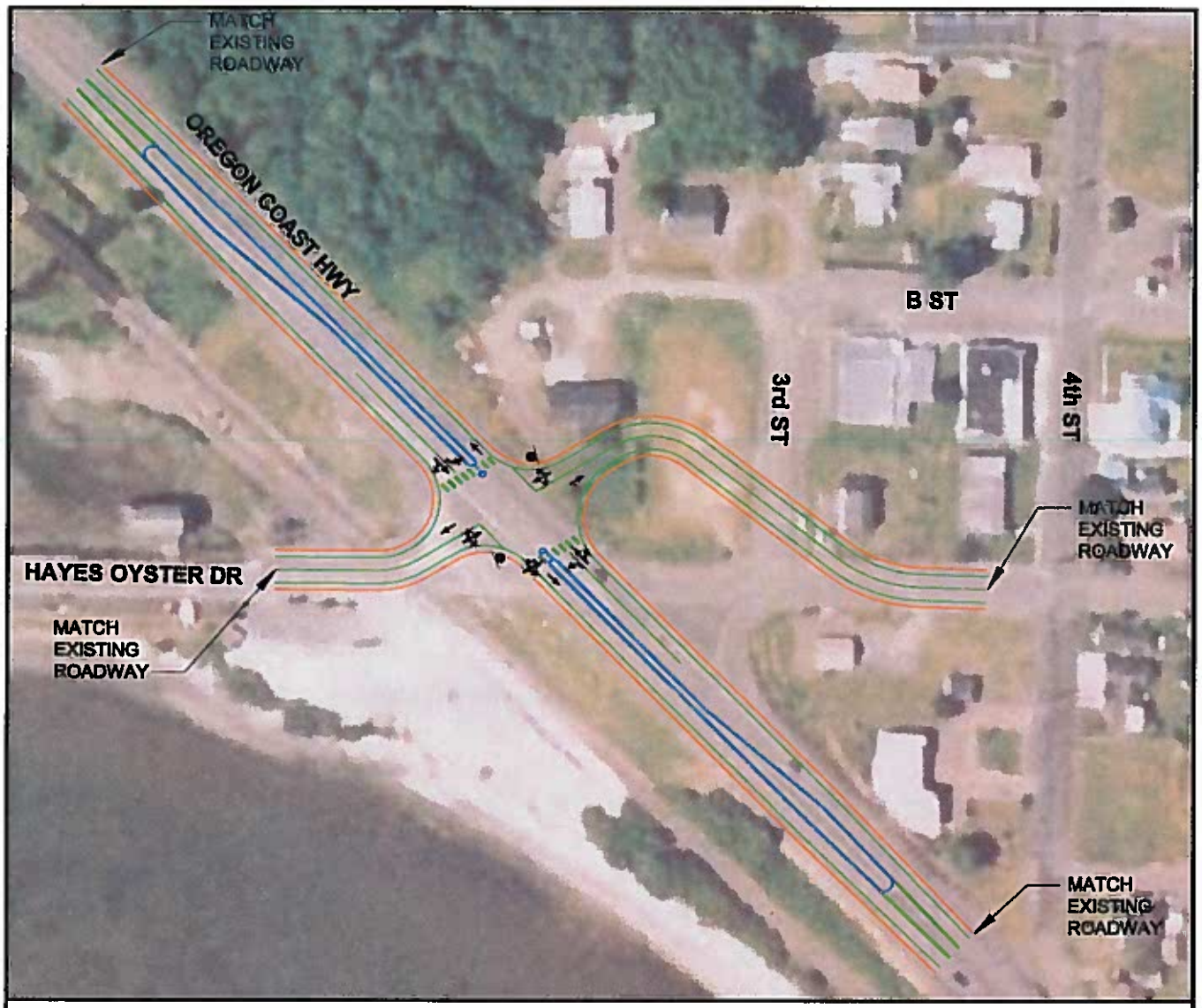

PEDESTRIAN CROSSING EXAMPLES

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LEGEND

- MEDIAN CURB
- EDGE OF PAVEMENT
- STRIPPING

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Figure 4-4.
Hayes-Oyster Drive at US 101
Draft Improvement Concept – Option 2
Bay City, Oregon

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Traffic Calming

Traffic calming interventions slow traffic by modifying the physical environment of a street. A variety of traffic calming measures are available.

- Traffic calming devices to improve pedestrian safety has shown that traffic calming can reduce the number of automobile collisions.
- Consultation with public works and public safety agencies (for example, fire and medical services) should occur prior to the installation of traffic calming improvements.

Chicanes

Chicanes form an S-shaped street which reduces vehicle speeds.

- Can also be achieved by establishing on-street parking on alternate sides of the street.
- Most effective on streets with narrower cross-sections.

Mini Traffic Circles

Mini traffic circles are raised or delineated islands placed at intersections, reducing vehicle speeds through tighter turning radii and narrowed vehicle travel lanes.

- Slow vehicle traffic while facilitating all turning movements at an intersection.
- Mini traffic circles can also include space for landscaping or art.
- A paved apron can be added to accommodate the turning radii of larger vehicles like fire trucks.

Choker Entrances

Choker entrances are intersection curb extensions or raised islands that visually or physically narrow the roadway.

- Have the effect of slowing traffic without necessarily narrowing lanes.
- Can also be designed to permit some vehicle turning movements from the street onto the cross-street while restricting other movements.

Speed Humps

Speed humps are rounded raised areas of the pavement requiring approaching motor vehicles to reduce speed.

- Discourage through travel on a street when a parallel through route exists.
- Four speed hump shapes—sinusoidal, circular, parabolic, and flat-topped—which differ in their slope shape.
- Speed humps are not recommended for emergency response routes or transit corridors.

Street Trees

In addition to their aesthetic value, street trees can slow traffic and improve safety for pedestrians. Trees add visual interest to streets and narrow the street's visual corridor which may cause drivers to slow down. Street trees should be appropriate for the desired streetscape and use.

Street trees provide a variety of benefits, including:

- Improving water quality of rivers and streams by reducing erosion and runoff.
- Providing shade for trail users and cooling of streams, improving fish habitats.
- Improving the air by capturing pollution particles, reducing carbon dioxide, and producing oxygen.
- Providing food and shelter for wildlife.
- Reducing stress and crime levels in communities.

Figure 4-5.
Traffic Calming

Transportation Refinement Plan
Bay City, Oregon

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Table 4-1. Traffic Calming Devices

Device Type	Description
Curb Extensions "Pinch Points"	Curb extensions, planters, or centerline traffic islands that narrow traffic lanes to control traffic and reduce pedestrian crossing distances.
Speed Tables, Raised Crosswalks	Ramped surface above roadway, 7-10 cm high, 3-6 m long.
Mini-Circles	Small traffic circles at intersections.
Median Island	Raised island in the road center (median) narrows lanes and provides pedestrian with a safe place to stop.
Channelization Islands	A raised island that forces traffic in a particular direction, such as right-turn-only.
Speed Humps	Curved humps 2.75 to 4 inches high and 10 to 13 feet long.
Rumble Strips	Low bumps across road make noise when driven over.
Chicanes	Curb bulges or planters (usually three) on alternating sides, forcing motorists to slow down.
Roundabouts	Medium to large circles at intersections.
Pavement Treatments	Special pavement textures (cobbles, bricks, etc.) and markings to designate special areas.
Bike Lanes	Marking bike lanes narrows traffic lanes.
"Road Diets"	Reducing the number and width of traffic lanes.
Horizontal Shifts	Lane centerline that curves or shifts.
2-Lanes Narrow to 1-Lane	Curb bulge or center island narrows two-lane road down to one lane, forcing traffic for each direction to take turns.
Semi-Diverters, Partial Closures	Restrict entry/exit to/from neighborhood. Limit traffic flow at intersections.
Street Closures	Closing off streets to through vehicle traffic at intersections or midblock.
Stop Signs	Additional stop signs, such as 4-way-stop intersections.
"Neotraditional" Street Design	Streets with narrower lanes, shorter blocks, T-intersections, and other design features to control traffic speed and volumes.
Perceptual Design Features	Patterns painted into road surfaces and other perceptual design features that encourage drivers to reduce their speeds.
Street Trees	Planting trees along a street to create a sense of enclosure and improve the pedestrian environment.
Woonerf	Streets with mixed vehicle and pedestrian traffic where motorists are required to drive at very low speeds.
Speed Reductions	Traffic speed reduction programs. Increased enforcement of speeding violations.

Typical goals of traffic calming projects include:

- Discouraging undesirable driver behavior.
- Encouraging safe pedestrian and bicycle use.
- Improving the safety of pedestrians, bicyclists, and drivers.
- Involving area residents in solving traffic problems.
- Making efficient use of tax dollars by prioritizing requests for improvements.

Jurisdictions with active traffic calming programs relay upon a great number of techniques including encouragement, education, and engineered solutions. At this time, Bay City is inadequately staffed to maintain a traffic calming program. Therefore, the engineered solution will be the focus of the following discussion and will be the basis of the recommendation to slow traffic on roadways identified as having speed and safety issues.

Engineering tools include a variety of traffic calming devices that can reduce speed, decrease traffic volumes, and/or improve safety. In deciding which traffic calming devices will work best for a particular street, a number of considerations must be weighed:

- Devices can have both benefits and disadvantages. For example, a device that effectively slows traffic may also have some impact on emergency vehicle response time. Some tradeoffs may have to be made.
- Some devices may be generally appropriate for local streets, but cannot be used on particular streets because of traffic or physical conditions.
- Specific neighborhood characteristics must be taken into account. Residents may want to consider how traffic devices might affect visual aesthetics, parking needs, or other issues important to the neighborhood.

Traffic calming involves Context Sensitive Design practices, which means that roadway planners and engineers have flexible standards that can accommodate community values and balanced objectives. New Urbanism incorporates traffic calming features into the design of new developments and urban redevelopment. It can make urban streets safer and quieter. It can increase residential property values and local economic activity.

Travel Impacts

Traffic calming reduces vehicle traffic speeds and sometimes volumes. Table 4-2 was developed by Fehr and Peers Transportation Consultants and is available, along with many additional resources, at www.trafficcalming.org. The table summarizes the traffic speed impacts of various traffic calming devices.

Table 4-2. Speed Impacts of Traffic Calming Measures

Measure	Sample Size	Avg. Speed Afterward (mph)	Avg. Speed Change	Avg. % Change
12' Humps	179	27.4	-7.6	-22
14' Humps	15	25.6	-7.7	-23
22' Tables	58	30.1	-6.6	-18
Longer Tables	10	31.6	-3.2	-9
Raised Intersections	3	34.3	-0.3	-1
Circles	45	30.2	-3.9	-11
Narrowings	7	32.3	-2.6	-4
One-Lane Slow Points	5	28.6	-4.8	-14
Half Closures	16	26.3	-6.0	-19
Diagonal Diverters	7	27.9	-1.4	-0.5

Source: Fehr and Peers Transportation Consultants 2008.

Safety Benefits

Traffic calming can reduce crash risk, particularly for pedestrians and cyclists. Lower vehicle speeds reduce the likelihood of crashes and the degree of injury that results (Leaf and Preusser 1998). Fatality risk increases with vehicle speed to the fourth power; a 1 percent reduction in the speed of a vehicle involved in a collision provides a 2 percent reduction in the risk of injuries and a 4 percent reduction in the risk of fatalities (Stuster and Coffman 1998). The severity of pedestrian injuries from vehicle crashes increase with the square of speed (ITE 1997). The probability of a pedestrian being killed in a crash is 3.5 percent if the vehicle is traveling at 15 mph, 37 percent at 31 mph, and 83 percent at 44 mph (Limpert 1994).

Field studies show significant safety benefits from traffic calming, as indicated in Table 4-3. A detailed survey (meta-analysis) of 33 studies by Elvik (2001) found that area-wide traffic calming programs reduce injury accidents by about 15 percent, with the largest reduction is on residential streets (25 percent), and somewhat smaller reductions on main roads (10 percent).

Table 4-3. Safety Impacts of Traffic Calming Measures, US Experience

Measure	Number of Observations	Average Number of Collisions		% Change in Collisions
		Before	After	
12' Humps	49	2.7	2.4	-11%
14' Humps	5	4.4	2.6	-41%
22' Tables	8	6.7	3.7	-45%
Circles	130	2.2	0.6	-73%
All Measures	192	2.6	1.3	-50%

Source: Fehr and Peers Transportation Consultants 2008.

Costs

Costs include program expenses and reduced motor vehicle traffic speeds. The table below provides generic cost estimates for typical traffic calming measures. The cost studies were completed in 1996 and 2002 by the City of Seattle Engineering Department (1996) and Zegeer et al. (2002), respectively. For the purposes of comparison among traffic calming options, the costs have been updated to 2010 dollars; a 3.5 percent escalation rate was used.

Table 4-4. Typical Costs of Traffic Calming Measures

Measure	Typical Units	Original Study Costs	2010 Estimates
Asphalt walkway	Per linear foot for 5-foot-wide walkway	$35	$54.74
Curb ramps	Each ramp	$1,500	$2,345.93
Bike lanes	Per mile to modify existing roadway (no new construction)	$30,000	$46,918.68
Chokers	One landscaped choker on asphalt street	$7,000	$10,947.69
Curb bulbs	Each bulb	$15,000	$23,459.34

Measure	Typical Units	Original Study Costs	2010 Estimates
Traffic circles	One landscaped circle on asphalt street	$4,000	$6,255.82
Chicanes	One landscaped chicane on asphalt streets	$8,000	$12,511.65
Marked crosswalk	One painted crosswalks, $3,000 for patterned concrete	$250	$390.99
Marked crosswalk (Patterned concrete)	One crosswalk for patterned concrete	$3,000	$4,691.87
Pedestrian refuge island	Depending on materials and conditions	$7,500	$11,729.67
Center medians	Per 100 feet	$17,500	$27,369.23
Traffic signals	One new signal	$45,000	$70,378.02
Raised intersection	One intersection	$70,000	$109,476.92
Traffic signs	One sign	$87	$136.06
Speed humps	One hump	$2,000	$3,127.91

Emergency Vehicles

Traffic calming critics raise the following concerns (Seconds Count 2000). Chief among these is the potential delay for emergency vehicles. As yet, this has been the only substantive criticism of proposed calming measures in Bay City.

- Delay to emergency vehicles.
- Civil rights violations (if traffic restrictions limit access to some neighborhoods).
- Increased air pollution (from speed humps).
- Discomfort to people with disabilities (from speed humps).
- Problems for cyclists.
- Liability and lawsuits.

Neighborhood Conflict

In field tests, Atkins and Coleman (1997) found that speed humps and traffic circles cause virtually no delay to small emergency vehicles, but add several seconds delay per device for large fire trucks. The per capita risk of death from residential fires is far lower than from pedestrian crashes, which implies that traffic calming can provide net safety benefits, although exact impacts vary depending on circumstances. Burden (2000a) describes how to incorporate emergency response concerns when planning traffic calming projects. Traffic calming devices such as curb extensions can benefit emergency response by removing the possibility of vehicles parking near a corner, which assures unrestricted entry at all times, and facilitates access to adjacent fire hydrants.

Recommended Improvements

Traffic calming recommendations were the subject of conversation at the first town hall meeting and the third PAC meeting. The following recommendations are based on these conversations:

- Construct hump/raised walkway at 4th and A Streets near the parking lot for the park. Chicanes could be used instead of the raised walkway.
- Construct chicanes at 5th Street and Hayes Oyster Drive, further refining the intersection design that was recently completed.

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5. PEDESTRIAN AND BIKE SYSTEM IMPROVEMENTS

5.1 CROSSINGS OF US 101

The community desires a more comfortable and user friendly crossing of US 101, as the City currently has no marked crossings of US 101. There are two proposed solutions to the need for better bicycle and pedestrian crossings of US 101, grade-separated crossings (bridges or undercrossings), and intersection designs with a focus on crosswalks. The following section discussed these two major options. Elements of both options can be combined.

Grade-Separated Crossings

Grade-separated crossings may be used to physically separate the crossing of pedestrian and bicycle traffic from other travel modes or to overcome topographic constraints. They may eliminate conflicts, but applications are limited to selected locations where the benefits clearly balance the public investment. Grade-separated crossings may be needed where existing bicycle/pedestrian crossings do not exist, where average daily traffic exceeds 25,000 vehicles, and where 85th percentile speeds exceed 45 mph. Separation crossings are also supplemental techniques for reducing accidents and addressing difficult grades or environmentally sensitive areas.

Grade-separated crossings should be considered when the physical characteristics of the location make such a structure feasible. If use of the grade separation will be less convenient than an at-grade crossing, barriers or supervision will be needed to assure a satisfactory level of use.

Safety is a major concern with both overcrossings and undercrossings. In both cases, trail users may be temporarily out of sight from public view and may have poor visibility themselves. Design and operation measures are available which can address trail user concerns. Overcrossings pose potential concerns about visual impact and functional appeal, as well as space requirements necessary to meet ADA requirements.

Grade-Separated crossings vary greatly in cost, purpose, and context. Given the relatively low prominence of the built environment in Bay City, a pedestrian bridge would be quite prominent and would partly define Bay City to motorists on US 101. The bridge, therefore, should be designed in an aesthetically pleasing manner, reflecting the goals and heritage of the Tillamook Bay area and Bay City specifically. The design of the bridge would need to be the subject of a new project with robust community involvement. The ideas provided below merely provide a starting place for the conversation, and hopefully will inspire community members to support the project.

Figure 5-1. Bicycle and Pedestrian Bridge

5.2 AT-GRADE CROSSINGS TREATMENTS

Legal Definition of a Crosswalk

A crosswalk exists despite the presence or absence of pavement markings. The 2000 Manual on Uniform Traffic Control Devices (MUTCD) (FHWA 2008) defines a crosswalk as:

a. "That part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs, or in the absence of curbs, from the edges of the traversable roadway; and in the absence of a sidewalk on one side of the roadway, the part of a roadway included within the extension of the lateral lines of the existing sidewalk at right angles to the centerline.

b. Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines or other markings on the surface."

Thus, a crosswalk exists at all intersections, regardless of markings, unless the crossing is specifically prohibited. Crosswalks only exist in mid-block locations when defined by pavement markings.

An engineering study is required before establishing marked crosswalks on state highways, at locations other than signalized approaches at intersections, stop signs, or at roundabouts. Marked crosswalks should only be considered at uncontrolled approaches when an engineering study demonstrates their need. These include criteria and considerations for the determination of when a pedestrian crossing should be marked with a parallel crosswalk and when it is appropriate to consider using continental (ladder) style crosswalks.

Crosswalks at Signalized Intersections

On state highways, marked crosswalks are required at all signalized approaches of an intersection, unless a traffic engineering investigation shows that a crosswalk should not be allowed. Pedestrian push buttons shall be accessible, preferably from an all-weather level landing. Crosswalks should be marked at channelized turn lanes controlled by a traffic signal or stop sign where there are crosswalks marked across the other controlled approaches. At other locations where the turn lane is controlled by a yield sign or uncontrolled, marking of pedestrian crosswalks may be considered.

Pedestrian signal heads shall be installed unless the crosswalk is closed by official action. Barriers and signs shall be posted for all officially closed crosswalks. All crosswalk closures at signalized intersections on state highways require the approval of the State Traffic Engineer based on a traffic engineering investigation. The primary reason for closing a crosswalk is safety, however geometric and operational factors may also be considered. Installation or removal of any sign prohibiting pedestrian traffic or closing a crosswalk requires the approval of the State Traffic Engineer.

Crosswalk Pavement Markings

There are several attributes of good crosswalks. These can be realized through a variety of the following tools and designs.

- Clarity – It is obvious where to cross and easy to understand possible conflict points with traffic.

- Visibility – The location and illumination of the crosswalk allows pedestrians to see and be seen by approaching traffic while crossing.
- Appropriate intervals – There is a reasonable match between the frequency of good crossing opportunities along a street and the potential demand for crossing.
- Short wait – The pedestrian does not have to wait unreasonably long for an opportunity to cross.
- Adequate crossing time – The time available for crossing accommodates users of all abilities.
- Limited exposure – Conflict points with traffic are few and the distance to cross is short or is divided into shorter segments with refuges.
- Continuous path – The crosswalk is a direct continuation of the pedestrian's travel path.
- Clear crossing – The crosswalk is free of barriers, obstacles, and hazards.

Marked crosswalks indicate to pedestrians the appropriate route across traffic, facilitate crossing by the visually impaired, and remind turning drivers of potential conflicts with pedestrians.

Crosswalk pavement markings should generally be located to align with the through-pedestrian zone of the sidewalk corridor.

The decision on whether to install standard or ladder crosswalk markings depends upon a variety of factors such as the number of pedestrians crossing, traffic speeds/volumes, number of lanes to cross, presence of nearby schools or senior centers, and history of collisions. In general, standard transverse markings are considered appropriate at controlled intersections, minor uncontrolled intersections, and other crossing locations with low traffic volumes/speeds, short crossing distance, and good visibility. High visibility ladder markings are generally applied at uncontrolled or mid-block locations, especially on major streets with high pedestrian volumes, heavy traffic volumes and speeds, and more than one lane each direction. See Table 5-1 for specific guidelines on the use of pavement markings.

Table 5-1. Crosswalk Markings

Style	Sample
Standard – Two solid white lines, 12 to 24 inches wide, spaced at least 6 feet apart. Also called "transverse."	

Style	Sample
Ladder – Adds cross bar "rungs" to the standard crosswalk marking described above. Width of ladder lines should be 1 foot, with minimum spacing of ladder lines between 1 and 5 feet.	

Criteria for Marking Crosswalks at Mid-Block Locations

Generally, mid-block crosswalks are discouraged for the same reasons as uncontrolled approaches. Mid-block crosswalks often do not generate good compliance from motorists. Mid-block crosswalks should only be considered when an engineering study demonstrates their need and the location meets specific criteria outlined in the ODOT Traffic Manual.

Street Crossing Amenities

The Oregon Highway Design Manual (OHDM) also provides information about crossing treatments that improve the visibility and safety of and for pedestrians crossing the roadway. Providing raised medians and illumination, and improving sight distance are several treatments recommended by the OHDM. Every effort should be made to remove or relocate objects that could obscure the view of and by pedestrians. Efforts should also be made to ensure that objects that could be a distraction to drivers are not located close to a crossing point. These include neon and other illuminated signs that are located on private property.

A raised median must be a minimum of 4 feet wide, but preferably 8 feet or more. They must be large enough to provide refuge for several pedestrians waiting at once and, ideally, several bicyclists. For wheelchair accessibility, it is preferable to provide at-grade cuts rather than ramps. Poles must be mounted away from curb cuts and out of the pedestrian path.

Oregon Supplement to the MUTCD

Pedestrian Activated Signal

A pedestrian activated signal may be warranted where a significant number of people are expected to cross a roadway at a particular location. Anticipated use must be high enough for motorists to get used to stopping frequently for a red light (a light that is rarely activated may be ignored when in use). Additionally, sight-distance must be adequate to ensure that motorists will see the light in time to stop. Warning signs should be installed on the approaching roadway.

New Traffic Signals[2,3]

On state highways, the Oregon Transportation Commission has authority to place, maintain, and operate traffic control devices. By this rule, the Oregon Transportation Commission delegates to the State Traffic Engineer the authority to approve the installation of traffic control devices on state highways.

On major projects, when a project team considers signalization, TPAU is contacted to do a preliminary analysis of the projected warrants for a traffic signal. TPAU should forward a copy of the warrants and any analysis to the Traffic Management Section (TMS) as well as the project team. This will provide notice to TMS and provide an early opportunity to identify relevant issues. When the project team decides to recommend a signal on a project, a request should be sent through the Region Traffic Manager, requesting the approval of the State Traffic Engineer.

MUTCD – Signal Warrant Criteria for Pedestrians

Warrant 4, Pedestrian Volume

Support:

The pedestrian volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

Standard:

The need for a traffic control signal at an intersection or mid-block crossing shall be considered if an engineering study finds that both of the following criteria are met:

A. The pedestrian volume crossing the major street at an intersection or mid-block location during an average day is 100 or more for each of any 4 hours or 190 or more during any 1 hour;

B. There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular travel.

In-Roadways Warning Lights Systems

Since the study intersections will not satisfy signal warrants, the project team considered the having pedestrians able to use in-roadway warning light flasher systems or in-roadway lights (IRLs). There has been extensive recent study of uncontrolled marked crosswalks. Flashing lights, often incorporated into these projects are known by many terms, most commonly referred to as an "in-pavement flasher system" (IPF). These devices are installed directly in the street pavement adjacent to the outside of the crosswalk markings. They are normally dark, but they are actuated to provide a flashing yellow light while the pedestrian crossing is in use. Unfortunately, at this time, ODOT does not permit these in its facilities.

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[2] Oregon Administrative Rules (2004), 734-020-0410, Traffic Signal Approval Process

[3] ODOT Traffic Manual (2001), Chapter 6, Section 6.14, Delegated Authority

IPF systems address concerns that motorists may "tune out" conventional flashing beacons that are operated continuously. Motorists appear to be more apt to notice a device that is currently flashing if it normally does not flash. Further, motorists may be more likely react to the warning condition if the flashing operation is more closely associated with the condition, not the site.

There are two means of activating IPFs: passive detection and push button. Each method has its advantages and disadvantages, but most agencies that have installed passive detection systems would not recommend its use in future installations unless improvements to the detection system are made. Push button detection is done using equipment similar to traffic signal pedestrian push buttons. It is generally more reliable, less expensive, and simpler to maintain than passive detection and is strongly preferred by maintenance personnel. However, the lights will begin to flash as soon as the button is pushed, regardless of the level of traffic at the time. Aggressive motorists may be unwilling to yield to pedestrians at first, even though the lights are flashing. Motorists driving within coordinated signal systems may also be more unwilling to yield while driving within platoons created by upstream traffic signals. As a result, it is common for the pre-set flash timer to time out before pedestrians can fully cross the street.

The traffic control devices (TCDs) are very critical for the safe and efficient transportation of people and goods. The MUTCD, by setting minimum standards and providing guidance, ensures uniformity of traffic control devices across the nation (FHWA 2008). The use of uniform TCDs (messages, location, size, shapes, and colors) helps reduce crashes and congestion, and improves the efficiency of the surface transportation system. Uniformity also helps reduce the cost of TCDs through standardization. MUTCD, Chapter 4L, In-Roadway Lights, provides guidance for Bay City's proposed application of IRLs at the planned crossings of US 101.

The MUTCD describes IRLs as special types of highway traffic signals installed in the roadway surface to warn road users that they are approaching a condition on or adjacent to the roadway that might not be readily apparent and might require the road users to slow down and/or come to a stop. The MUTCD standards include the following:

- In-Roadway Lights shall not exceed a height of 19 mm (0.75 in) above the roadway surface.
- In-Roadway Warning Lights at crosswalks shall be installed only at marked crosswalks with applicable warning signs. They shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic control signals.
- In-Roadway Warning Lights at crosswalks shall be installed along both sides of the crosswalk and shall span its entire length.
- In-Roadway Warning Lights at crosswalks shall initiate operation based on pedestrian actuation and shall cease operation at a predetermined time after the pedestrian actuation or, with passive detection, after the pedestrian clears the crosswalk.
- In-Roadway Warning Lights at crosswalks shall display a flashing yellow signal indication when actuated. The flash rate for In-Roadway Warning Lights at crosswalks shall be at least 50, but not more than 60, flash periods per minute. The flash rate shall not be between 5 and 30 flashes per second to avoid frequencies that might cause seizures.

- In-Roadway Warning Lights shall be installed in the area between the outside edge of the crosswalk line and 3 m (10 ft) from the outside edge of the crosswalk. In-Roadway Warning Lights shall face away from the crosswalk if unidirectional, or shall face away from and across the crosswalk if bidirectional.

The City of Fountain Valley, California, retained Katz, Okitsu & Associates (Miller and Dore 2003) to review the state-of-the-art for use of IPFs. The study included a survey of existing users to obtain their experiences and opinions. Thirty-five public agencies were identified as using IPF systems when the study was conducted in the year 2000. This represented about 100 installations, mostly in California and Washington. However, the number of agencies that have installed these systems and the number of locations have continued to increase since the study was completed. The following findings are from the Miller and Dore study.

> "[Studies] have found that IPFs improve motorist response to pedestrians within crosswalks. Braking distance prior to crosswalks increases following installation, and the percentage of motorists who yield to pedestrians also increases at typical installations. There were no attempts to measure or quantify safety benefits of the systems prior to the Fountain Valley study, because the number of locations and years of experience was not yet significant to allow a comparison.
>
> Other striping and marking techniques may be equally effective at reducing pedestrian accidents at marked crosswalks, including advanced limit lines and actuated overhead flashers. However these passive treatments may not be as effective in producing greater motorist compliance with pedestrian right-of-way. The increase in motorist response is probably the key element in actuated flash systems that may distinguish them from passive treatments.

5.3 OTHER IMPROVEMENTS FOR PEDESTRIANS AND CYCLISTS

Off-Street Facility Evaluation and Maintenance

Proper maintenance of bicycle and pedestrian facilities is a critical element of providing a safe and user-friendly system. Table 5-2 summarizes a recommended maintenance schedule for the City's bicycle and pedestrian system. These guidelines address maintenance of the system's off-street portions.

Table 5-2. Sample Trail/Pathway Maintenance Guidelines

Maintenance Task	Frequency
Inspections	Seasonal – at both beginning and end of summer
Signage replacement	As needed when signs are missing or damaged
Site furnishings; replace damaged components	As needed
Pavement markings replacement	1-3 years or as markings became faded or illegible
Pavement blowing/and pavement sweeping	As needed; before high use season and after major storm events. Greater frequency in fall may be required due to accumulation of leafy debris
Pavement sealing; pothole repair; pavement smoothing	5-15 years
Lighting repair	Annually
Ensure bicycle detection at traffic signals	In response to citizen complaint or at the installation and replacement of actuated signals

Maintenance Task	Frequency
Introduced tree and shrub plantings, trimming	1-3 years
Shrub/tree irrigation for introduced planting areas	Weekly during summer months until plants are established
Shoulder plant trimming (weeds, trees, branches)	Twice a year; middle of growing season
Major damage response (fallen trees, washouts, flooding)	Schedule based on priorities
Culvert inspection	Before rainy season; after major storms
Maintaining culvert inlets	Inspect before onset of wet season
Trash disposal	Twice monthly
Litter pick-up	Twice monthly
Graffiti removal	Weekly; as needed

On-Street Facility Evaluation and Maintenance

For an on-street bikeway networks and sidewalks, key management and maintenance issues will include signage installation and maintenance, street sweeping and pavement maintenance. Each of these management and maintenance activities should be completed in a consistent manner and on a regular basis. Many of the issues and strategies discussed below can be applied to off-street facilities as well.

Sweeping

Bicyclists often avoid shoulders and bike lanes filled with sanding materials, gravel, broken glass, and other debris; they will ride in the roadway to avoid these hazards, causing conflicts with motorists. Debris from the roadway should not be swept onto sidewalks (pedestrians need a clean walking surface), nor should debris be swept from the sidewalk onto the roadway. A regularly scheduled inspection and maintenance program helps ensure that roadway debris is regularly picked up or swept. Activities of an effective maintenance program include the following:

- Establishment of a seasonal sweeping schedule that prioritizes roadways with major bicycle facilities and routes (the future Collectors and Arterials).
- Sweeping walkways and bikeways whenever there is an accumulation of debris on the facility.
- In curbed sections, sweepers should pick up debris; on open shoulders, debris can be swept onto gravel shoulders.
- Providing extra sweeping in the fall in areas where leaves accumulate in bike lanes.

Roadway Smoothness

Bicycles are much more sensitive to subtle changes in roadway surface than motor vehicles. Various pavement materials are used to pave roadways and some are smoother than others. Compaction is also an important issue after trenches and other construction holes are filled. Uneven settlement after trenching can affect the roadway space nearest the curb where bicycles travel. Sometimes compaction is not achieved to a satisfactory level, and an uneven pavement surface can result due to settling over the course of days or weeks. Public Works should consider the following:

- On all bike routes and lanes identified in the Refinement Plan, the smallest possible chip should be used for chipsealing the bike lanes and shoulders.
- On new construction, the finished surface of bikeways should not vary more than 0.25 inch from the lower edge of an 8-foot-long straight edge when laid on the surface in any direction.
- The surface of a roadway open to bicycle travel should be smooth and free of potholes, and the pavement edge should be uniform.
- Pavement shall be maintained so ridge buildup does not occur at the gutter-to-pavement transition or adjacent to railway crossings.
- Public Works officials should inspect the pavement two to four months after trenching construction activities are completed to ensure that excessive settlement did not occur.

Shared Lane Markings ("Sharrows")

Some communities use high-visibility pavement markings to delineate specifically where bicyclists should operate within the travel lane. These markings, known as shared lane markings or "sharrows," are often used on streets where dedicated bicycle lanes are desirable but are not possible due to physical or other constraints. Sharrows are placed strategically in the travel lane to alert motorists of bicycle traffic, while also encouraging cyclists to ride at an appropriate distance from the "door zone" of adjacent parked cars. Placed in a linear pattern along a corridor, typically every 100-200 feet, sharrows also encourage cyclists to ride in a straight line so their movements are predictable to motorists. Sharrows made of thermoplastic tend to last longer than traditional paint.

Figure 5-2. Sharrows

Sharrow marking is intended to do the following:

- Reduce the chance of bicyclists impacting open doors of parked vehicles on a shared roadway with on-street parallel parking.
- Alert road users within a narrow traveled way of the lateral location where bicyclists ride.
- Be used only on roadways without striped bicycle lanes or shoulders.

Green Bike Lanes

Colored bike lanes are used in some cities to guide cyclists through major vehicle/bicycle conflict points. These conflict areas are locations where motorists and cyclists must cross each other's path (e.g., where a motorist must cross an adjacent bicycle lane to make a right-hand turn). Cyclists are especially vulnerable at locations where the volume of "conflicting" vehicle traffic is high, and where the vehicle/bicycle "conflict area" is long (e.g., at an intersection with a wide turning radius promoting vehicle turning movements at higher speeds).

While green bike lanes are not an official standard in Oregon at this time, they continue to be successfully used in other cities. Bay City and ODOT should evaluate the feasibility of applying these treatments at major vehicle/bicycle conflict points.

6. FUTURE TRANSPORTATION SYSTEM

Each of the proposed improvement projects contributes to the Future Transportation System Plan for Bay City shown in Figure 4-1. Alternative approaches to the City's transportation needs were discussed at the first town hall meeting. At the meeting, certain alternatives were identified to be the locally preferred alternatives. In other cases, the projects were prioritized so that less expensive projects could be in the short-term goals of the plan while the final designs for such locations would be constructed later in the 20-year planning period. A good example of this is the intersection of US 101 and Hayes Oyster Drive. The City wants a new redesign to be in the plan as well as a proposed bike and pedestrian bridge. At PAC meeting #3, which followed the town hall meeting, further refinement occurred and the locations of proposed traffic calming measures were revised.

The City faces significant funding challenges, having a history of minimal revenue generation. Through the Refinement Planning process, new funding mechanisms will be introduced, supported, and potentially adopted. Table 6-1 and Table 6-2 show the improvement projects that are both in the 20-year financially constrained plan, and those projects that are considered to be advantageous but not feasible within the plan period. The categorization and prioritization of these projects was completed at the town hall and PAC meeting in February 2009.

Table 6-1. Improvement Projects in 20-Year Plan

Project	Time Period	Estimated Cost	Estimated Private Share	Estimated Public Share	Notes
Redesign of Warren and US 101	Medium	$350,000	$105,000	$245,000	Crosswalk, Lighting, Gateway Design
Redesign of Hayes Oyster and US 101	Short	$325,000	$97,500	$227,500	Crosswalk, Lighting, Gateway Design
Downtown Streetscape	Short	$2,500,000	$750,000	$1,750,000	
Redesign of 5th and Portland	Medium	$9,000	$2,700	$6,300	crosswalk, better alignment
Traffic Calming on 4th	Short	$8,000	$2,400	$5,600	Chicanes
Traffic Calming at 5th and Hayes Oyster	Medium	$3,000	$900	$2,100	Chicanes, Crosswalks
Pathway along rail road	Medium	$900,000	$270,000	$630,000	
Pedestrian Bridge at Hayes Oyster Drive	Long	$3,500,000	$1,050,000	$2,450,000	
Fifth Street Intersection with US Highway 101	Medium	Not yet available	Not yet available	Not yet available	Improved design
TOTALS		**$7,595,000**	**$2,278,500**	**$5,316,500**	

Table 6-2. Improvement Projects Not in 20-Year Plan

Project	Notes
Pedestrian Bridge at Warren	Post 20-year
Pathways along Patterson and Jacoby Creeks	Considered as recreation projects, not in transportation refinement plan financially constrained plan
Upgrade of Urban Collectors (Tillamook, McCoy, Warren, and 5th)	Post 20-year

Assuming that the proposed system development charges and other new financing mechanisms are implemented, the City may be able to secure as much as 30 percent of the needed funds for project completion. The projected residential growth in the city is approximately one-third of the future demand on facilities. Downtown commercial development is projected to increase and more than double its current commercial activity level. However, there is not significant industrial growth forecast for the city. Therefore, it could be assumed that non-residential development will also constitute around 30 percent of the total demand by 2030.

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Final Bay City Technical Memorandum #3 Final Recommended Code and Policy Amendments

Prepared for

City of Bay City
P.O. Box 3309
Bay City, OR 97107

July 2009

CITATION

This project is partially funded by a grant from the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. This TGM grant is financed, in part, by federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), local government, and State of Oregon funds.

The contents of this document do not necessarily reflect views or policies of the State of Oregon.

Parametrix. 2009. Final Bay City Technical Memorandum #3
Final Recommended Code and Policy Amendments. Prepared by Parametrix,
Portland, Oregon. July 2009.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

ADA	Americans with Disabilities Act
CDBG	Community Development Block Grant
EDU	Equivalent Dwelling Unit
ITE	Institute of Traffic Engineers
LID	Local Improvement District
LWCF	Land and Water Conservation Fund
mph	miles per hour
ODOT	Oregon Department of Transportation
ORS	Oregon Revised Statute
OTIB	Oregon Transportation Infrastructure Bank
PAC	Project Advisory Committee
Refinement Plan	Bay City Transportation Refinement Plan
SDC	System Development Charge
SCA	Small City Allotment
Synchro	HCM-Compatible Traffic Analysis Software for Intersections
UGB	Urban Growth Boundary

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1. INTRODUCTION

This report is one of several technical memoranda that has been or is being prepared to support development of a Transportation Refinement Plan (Refinement Plan) for the City of Bay City. This report provides a summary of items from previous memoranda which constitute the body of the Refinement Plan as well as the implementation instruments in support of previously identified transportation improvements. The Policy ands Code language contained herein is recommended for adoption into the Bay City ordinances and Comprehensive Plan.

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2. COMPREHENSIVE PLAN POLICY AMENDMENTS

The following recommended amendments provide the policy basis of the recommended improvement project list, code amendments, and other actions recommended as part of the Bay City Transportation Refinement Plan:

Action: Amend Comprehensive Plan as indicated:

Existing Goals and Policies:

GOAL I: TO MAINTAIN A HIGH QUALITY OF LIFE IN KEEPING WITH THE NATURAL ENVIRONMENT

GOAL II: TO ENCOURAGE A CITY FORM WHICH IS COMPACT, EFFICIENT, AND ATTRACTIVE.

GOAL III: TO MAINTAIN THE QUIET RESIDENTIAL NATURE OF BAY CITY.

GOAL IV: TO SUPPORT THE EFFORTS OF TILLAMOOK COUNTY IN ATTRACTING INDUSTRY WHICH IS COMPATIBLE WITH THE ENVIRONMENT AND IS SUPPORTIVE OF THE NATURAL RESOURCES OF THE AREA.

GOAL V: TO PROTECT THE NATURAL RESOURCES OF THE AREA.

GOAL VI: TO PROVIDE RECREATION OPPORTUNITIES FOR TOWNSPEOPLE AND VISITORS AND PROTECT THE OPEN SPACE AND UNIQUE AREAS OF THE CITY.

This proposed amendment came from the Downtown Transportation Plan

Proposed Addition as Policy 6. **The City will consider future development of an off-street trail along Patterson Creek and Jacoby Creek as described in the Bay City Downtown Transportation Plan, Section 4, Preferred Alternatives.**

GOAL VII: TO ENCOURAGE DEVELOPMENT WHICH IS PROTECTIVE OF NATURAL TOPOGRAPHY AND VEGETATION, WHICH AVOIDS NATURAL HAZARDS, AND WHICH PROTECTS THE ENVIRONMENTAL QUALITY OF THE SURROUNDING AREA.

GOAL VIII: TO PROVIDE A WIDE VARIETY OF HOUSING OPPORTUNITIES IN BAY CITY.

Additional Policies

We propose the elimination of the following goals as cycling is addressed more broadly by policies proposed for the new Transportation Goal X.

[Bicycles:
1. The Oregon Coast Bicycle Route passes through the City on U.S. Highway 101. Development along the route or changes to the Highway should be compatible with its use by bicyclists.]

We propose moving the following bicycle policy to the new Transportation Goal X.

[2. The Street Section of the Public Facilities Plan generally does not require sidewalks as part of street improvements. However, as traffic becomes heavier along City arterials and in the commercial areas, consideration should be given to the requirement of sidewalks. Sidewalks would be built as part of new public or private street or land development.]

GOAL IX: TO DEVELOP A CITIZEN INVOLVEMENT PROGRAM THAT INSURES THE OPPORTUNITY FOR CITIZENS TO BE INVOLVED IN ALL PHASES OF THE PLANNING PROCESS.

We propose moving the following street policies to the new Transportation Goal X.

[STREET POLICIES

1. The City shall continue to endorse the County's efforts in maintaining arterial roads through the area. It is the policy of the City that as long as these roads have regional significance beyond the City limits, and therefore benefit County residents in the general area, the County Road Department should be responsible for maintaining them.

2. The City Street Standards shall apply to all proposed subdivisions of land, planned developments, and major street improvements (beyond routine maintenance) sponsored by the City, County, or adjacent property owners. In order to vary from these standards, the party proposing the street or road improvement should show to the satisfaction of the City Council why a lesser improvement is adequate based on topography or other unusual circumstances.

3. Construction of streets in new partitions subdivision, planned unit developments, and rights-of-way where no street existed previously shall be the responsibility of the adjacent property owners, except where the street is an arterial or feeder.

4. The City shall have the opportunity to approve or deny all access permits along County roads within the urban growth boundary. The objective will be to reduce the number of driveways along major streets.

5. The City should consider the use of unimproved street rights-of-way for bicycle and walking paths or trails rather than for street vacations.

6. In new developments, the City shall not accept streets into the City system until they are in conformance with City standards and all utilities are installed which would require future street excavation.

7. Efforts should be made to build streets and roads to conform to the natural contours of the land; where road cuts are necessary, they should be made so as not to cause future soil slippage or other geologic problems.

8. Wherever possible, new streets should avoid using active farm or timber lands.]

Proposed New Goal and Policies

Proposed deletions are shown in [bracketed italicized text].

Proposed additions, including policies moved from elsewhere in the Comprehensive Plan, are shown in **BOLD TEXT.** New language that is proposed within these relocated policies is both **Bold and Underlined**.

(We propose adding GOAL X on page 27 of the comp plan)

GOAL X: TO SERVE OUR CITIZENS SAFETY AND MOBILITY WITH A TRANSPORTATION SYSTEM THAT CONTRIBUTES TO ECONOMIC PRODUCTIVITY, COMMUNITY LIVABILITY, AND THE HEALTH OF THE ECOSYSTEM.

Policies:

1. **As funding resources are available, the City, working with State, County, private and other partners, shall endeavor to provide a multi-modal transportation system that is safe and efficient.**
2. **The Bay City Transportation System should be designed to improve options and facilities for pedestrians and bicyclists and should include safe pedestrian crossings of US 101.**
3. **The City street design standards are contained in the Public Works Standards.**
4. [Previously BCCP Bicycle Policies 2] The Transportation Section of the Public Works Standards does not always require sidewalks as part of street improvements; however, along City arterials, collectors and in the commercial areas, the City may require that sidewalks are built as part of new public or private streets or land development.
5. [Previously BCCP Street Policies 2] The City Street Standards shall apply to all proposed subdivisions of land, planned developments, and major street improvements, beyond routine maintenance [*sponsored by the City , County or adjacent property owners*]. In order to vary from these standards, the party proposing the street or road improvements should show to the satisfaction of the City Council why a lesser improvement is adequate based on topography or other unusual circumstances.
6. **The City shall work with public agencies and private parties to identify a secondary emergency access from the Kilchis Point area of the City.**
7. **The City shall endeavor to develop new sources of revenue or to increase the yield from existing sources in order to implement needed and agreed upon improvements to the transportation system.**
8. **The City shall work with Tillamook County and the Oregon Department of Transportation (ODOT) to ensure appropriate speed limits on US Highway 101.**
9. [Previously BCCP Street Policies 1] The City shall continue to **coordinate with Tillamook County to maintain** [*endorse the County's efforts in maintaining*] arterial **and collector** roads through the area. [*It is the policy of the City that as long as these roads have regional significance beyond the City limits, and therefore benefits the County residents in the general*
10. [Previously BCCP Street Policies 3] Construction of streets in new partitions, subdivisions, planned unit developments and rights-of-way where no street was previously developed **or where the street is substandard in development** shall be the financial responsibility of the adjacent property owners **whose property is served by the street development** [*except where the street is an arterial or feeder*].
11. [Previously BCCP Street Policies 4] The City shall have the opportunity **to provide recommendation about** [*approve or deny*] all access permits along County roads

within the City Limits or Urban Growth Boundary. [*The objective shall be to reduce the number of driveways along major streets.*]

12. [Previously BCCP Street Policies 5] The City should consider the use of unimproved street rights-of-way for bicycle **paths,** [*and*] walking trails, **and other public uses,** first, before consideration of vacations.
13. [Previously BCCP Street Policies 6] In new developments, the City shall not accept streets into the City system until they are in conformance with City standards and all utilities are installed which would require future street excavation.
14. [Previously BCCP Street Policies 7] Efforts should be made to build streets and roads to confirm to the natural contours of the land; where road cuts are necessary, they should be made so as not to cause future soil slippage or other geologic problems.
15. [Previously BCCP Street Policies 8] Wherever possible, new streets should avoid using active farm or timber lands.
16. **The City should endeavor to implement traffic calming programs where there are speed and safety issues.**
17. [Previously BCCP Bicycle Policy 1] The Oregon Coast Bicycle Route passes through Bay City on US Highway 101. Development along the route or changes to the Highway should be compatible with its use by bicyclists.

3. RECOMMENDED CODE CHANGES

3.1 PARKING REQUIREMENTS

The following amendments will help to stimulate economic development, minimize excess parking, minimize impervious surfaces and stormwater run-off, better accommodate cyclists, and provide a more pleasing urban form.

Action: Amend Ordinance Number 374, Section 3.5(a) as shown to require less parking for five uses and provide bicycle parking requirements:

Refer to the table listing uses and number of spaces required as (a) and revise as shown below:

(a) Minimum parking requirements

Retail. One (1) space per 650 square feet…(previously 1/500)

Retail with large floor area requirements. One (1) space per 1,000 square feet…(previously 1/800)

Office. One (1) space per 600 square feet…(previously 1/800)

Eating/Drinking Establishment. One (1) space per 300 square feet…(previously 1/200)

Churches/Meeting Halls and Lodges. One (1) space per 550 square feet…(previously 1/400)

Action: Amend Ordinance Number 374, to add Section 3.5 (b) to include the following:

(b) Downtown parking requirements

All parking areas serving businesses within the northern/ downtown High Intensity Zone need only provide 70% of the parking minimum requirements.

Action: Amend Ordinance Number 374, to add Section 3.5 (c) to include the following:

(c) Shared parking

In the High Intensity Zone, the City may reduce the required number of parking stalls up to 50% when conditions have been met for the use of shared parking as outlined herein. Required parking facilities for two or more uses, structures, or parcels of land may be satisfied by the same parking facilities used jointly, to the extent that the owners or operators show that the need for parking facilities does not materially overlay (e.g., uses primarily of a daytime versus nighttime nature), that the shared parking facility is within 800 feet of the potential uses, and provided that the right of joint use is evidenced by a recorded deed, lease, contract, or similar written instrument establishing the joint use.

Action: Amend Ordinance Number 374, to add Section 3.5 (d) to include the following:

(d) Parking maximums

The following off-street automobile parking minimums are hereby established… Parking Maximums are set at 130 percent of the minimums.

Action: Amend Ordinance Number 374, to add Section 3.5 (e) to include the following:

(e) Parking variances

Applications for parking variances may be requested from the City Planning Commission.

Action: Amend Ordinance Number 374, to add Section 3.5 (f) Fee in Lieu

(f) Fee in Lieu of parking requirements

An applicant in the North High Intensity Zone may apply to the City to pay a fee in lieu of providing up to 50% of the required parking. The City may grant the request based on the number of spaces the City has available.

The City Council shall establish a rental fee for each fee-in-lieu parking space based on the cost of the land, the construction of the parking space, and the annual cost of maintaining the space consistent with city standards.

Amend Ordinance Number 374, to add Section 3.62 to include design requirements for bicycle parking:

3.1.2 BICYCLE PARKING

j. Bicycle parking facilities shall be provided in accordance with the standards set forth in the Public Works Standards. Bicycle parking shall be provided at the following rates.

   a. Multifamily dwelling with four or more units. One (1) per unit.

   b. Commercial and Industrial and other non-residential uses). One bicycle parking space for every five (5) auto spaces.

Then in the Public Works Standards add:

b. Bicycle parking facilities should either be a lockable enclosure in which the bicycle is stored, or a secure stationary rack which permit the locking of the bicycle frame and one (1) wheel to the rack and support the bicycle in a stable position without damage to wheels, frame, or components.

c. Bicycle parking spaces should be at least six (6) feet long and two and one half (2.5) feet wide, and overhead clearance for covered spaces should be at least seven (7) feet.

d. Bicycle racks or lockers should be securely anchored to the surface or structure.

e. Bicycle racks should have a minimum height of thirty-three (33) inches and/or the area necessary for bicycle parking shall be delineated by visible markers.

f. Where bicycle parking areas are not clearly visible to approaching cyclists, signs at least twelve (12) inches square should direct them to the facility. The sign should give the name, phone number, and location of the person in charge of the facility, where applicable.

g. Lighting of not less than one- (1) foot-candle illumination at ground level should be provided in all bicycle parking areas.

h. Access to facilities should be convenient; where access is by sidewalk or walkway, curb ramps should be provided where appropriate and ADA compliant. Parking facilities intended for employees should be located near the employee

entrance, and those for customers or visitors near the main public entrances. Convenience should be balanced against the need for security if the employee entrance is not in a well-traveled area.

i. Bicycle parking should be clustered in lots not to exceed sixteen (16) spaces each.

j. Provide bike racks within fifty (50) feet of the entrance. Where a security guard is present, provide racks behind or within view of a security guard. The location should be outside the normal flow of pedestrian traffic.

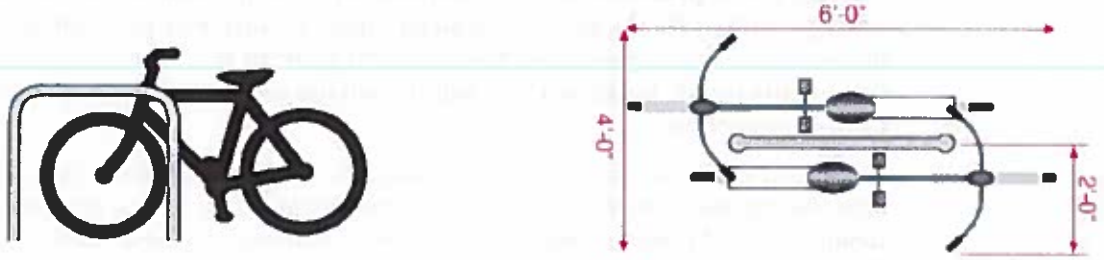

Figure 3-1. Bicycle Rack Placement Guidelines

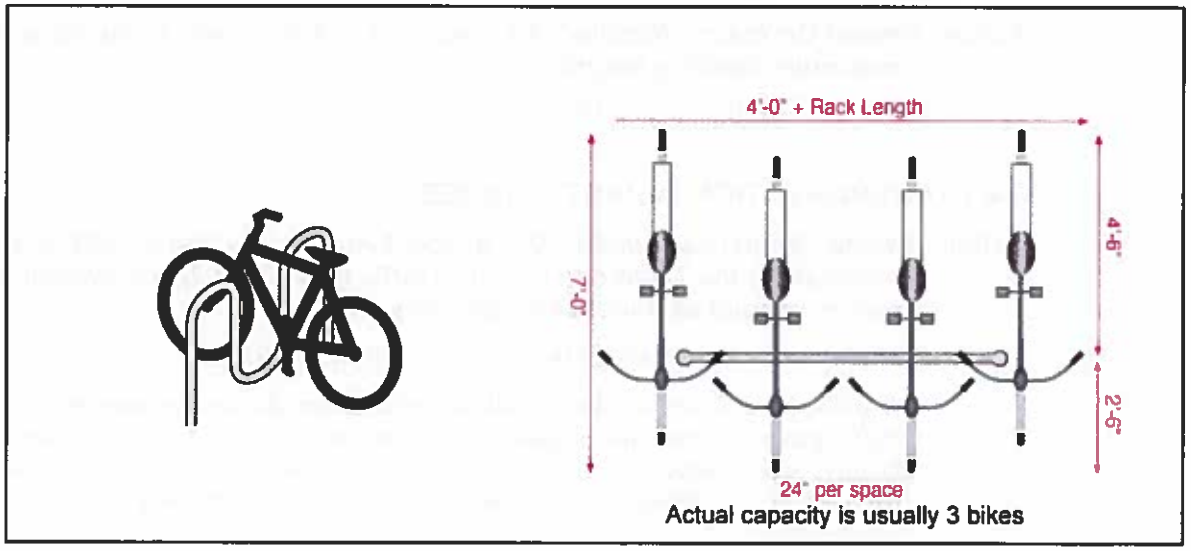

Figure 3-2. Ribbon, Spiral, or Freestanding Racks

3.2 SHADOW PLATTING

The following amendment requires future development to be considered in site design.

Action: Add to Ordinance Number 374, Section 3.102 (g) Density Considerations; number Sec. 3.102

1. Land within designated wetlands shall not be used as part of density calculations
2. **When lots are created through a partition or subdivision, or site development of existing lots is proposed, a minimum density of 80 percent of the maximum dwelling units permitted by the zone is required unless tentative or preliminary plans demonstrate that the development does not prevent the future opportunity to reasonably divide oversized lots and to provide for street, drainage facility, and utility connections.**

Subdivided is four or more lots, this should also apply to partitions (two or more parcels). Also, this provision should apply to development of land that has the potential for partition or subdivision and therefore should be contained in a more general section of the ordinance Section 3, Supplemental provisions.

3.3 BUILDING HEIGHTS

Action: Amend Ordinance Number 374, Section 1.413 as shown to increase the allowed maximum building height:

Maximum of THIRTY-SIX (36) feet…

3.4 TRANSPORTATION IMPACT STUDIES

Action: Amend Ordinance Number 374, Article 5 Adding Section 5.1055 as shown below. Alternately, the Tillamook County Traffic Impact Analyses system has been recommended as a model for Bay City.

SECTION 5.1055 TRANSPORTATION IMPACT STUDIES

A transportation impact study shall be required for all development applications in which traffic generated from the proposed development is projected to exceed the capacity of the facility and/or have a significant impact upon any affected transportation corridor or intersection, as determined by the City based on estimated trip generation by the development.

a. A transportation impact study shall include, at a minimum, an analysis of: trip generation, modal split, distribution, assignment for the proposed development; and an analysis of the projected impact of the proposed development upon the current operating level of any affected transportation corridor or intersection of regional significance.

b. A transportation impact study shall be prepared by and/or under the supervision of a registered professional traffic engineer in the state of Oregon.

c. A transportation impact study shall be based on traffic counts obtained within twelve (12) months of the date of the development application. The traffic counts shall reflect representative traffic conditions within transportation corridors and at intersections of regional significance.

d. A transportation impact study shall not be required to analyze impacts on affected transportation corridors or intersections of local significance located more than the following distances from the proposed development (as measured by straight-line distance):

   1) Less than five hundred (500) new peak hour trips at development site: analyze links and intersections within one half (.5) miles;

   2) Five hundred and one (501) or more new peak hour trips at development site: analyze links and intersections within one (1) mile.

e. The City reserves the right to require an applicant to provide additional data and/or analysis as part of a particular transportation impact study, where the City determines that additional information or analysis is required to implement the standards and requirements contained in this section.

f. No traffic impact study shall be required, pursuant to the provisions of this section, where the proposed development will includes fewer than 25 residential dwelling units, or 25,000 square feet of non-residential space.

g. Upon the written request of an applicant, the City Council may waive the requirement for a transportation impact study, or limit the scope of analysis and required elements of a traffic impact study where the City Council determines the potential transportation impacts and the required mitigation for the affected transportation corridor.

h. The Traffic Impact Study will be used to determine impacts, and propose mitigations. The City will negotiate with the applicant to determine the most appropriate mitigations, which shall then be provided by the applicant or an equivalent payment must be made so that the City can initiate the required transportation system improvement project. These improvements must be proportionate and directly related to the impacts of the proposed development.

i. Nothing in this Section supersedes any requirements for traffic analysis or mitigation of traffic impacts by the State of Oregon, Tillamook County, or other affected jurisdictions.

3.5 STREET STANDARDS

Action: To the Public Works Standards add language as shown below:

Streets shall be developed in accordance with the cross sections found within the Public Works Standards:

In order to vary from the Public Works Standards, the party proposing the street or road improvement shall show to the satisfaction of the City Council that the lesser improvement is adequate based on topography or other unusual circumstances.

Please refer to cross sections for graphic depictions of the proposed design standards. These will also be included in the Public Works Standards

Design criteria for all roadways shall be based on design speed and guidelines in AASHTO: Policy on Geometric Design of Highways and Streets. The Urban Collectors (Downtown) shall be improved to the cross-sections found in the Bay City Downtown Transportation Plan.

Table 3-1. Street Widths and Standards

Street Classification	Minimum ROW Width	Maximum ROW Width	Curb to Curb	Notes
Arterial with Turn Lane	64 ft.	68 ft.	50 ft.	
Arterial with Median	66 ft.	70 ft.	56 ft.	
Urban Collector	41 ft.		30 ft.	
Urban Collector (with Pathway)	36 ft.		20 ft.	with 10 ft pathway not in Curb to Curb measurement
Urban Collector (Downtown 4th+)	60 ft.		44 ft.	
Urban Collector (Downtown 5th+)	62 ft.		46 ft.	
Local Street	34 ft.		26 ft.	
Local Street (narrow)	20 ft.		20 ft.	

3.6 STREET TREES

The following amendment requires street trees in both public and private designs.

Action: To Ordinance Number 374 Article 5 Section 5.105 (f) Improvement Requirements, add 16) as shown below:

15) One tree, as specified in the Public Works Standards, for every 30 feet of street frontage along public and private roadways.

Then in Public Works Standards:

Street trees should be added so that there is one tree for every 30 feet of frontage, and consistent with the Cross Sections for the respective functional classification.

For trees along all streets (outside of downtown), acceptable species include:

1. *Amelianchier grandiflora* – Serviceberry
2. *Fraxinus latifolia* – Oregon Ash
3. *Cornus nuttalli* – Pacific Dogwood

For street trees in the downtown area, acceptable species include:

1. *Acer rubrum* 'Bowhall' – Bowhall Maple
2. *Fagus sylvatica* 'Fastigiata' – Fastigiate Beech
3. *Prunus serrulata* 'Amanogawa' – "Amanogawa" Cherry

Alternate, trees species may be allowed with written approval from the City.

4. FINANCING OF PUBLIC PROJECTS

4.1 REVENUE FORECAST AND PROJECT LIST

Slightly more than **$23,000** dollars of public funding per year will have been spent from 1998 through 2008 on transportation projects in Bay City. For the purposes of estimating future public funds available for transportation projects, these historic data were used to develop a 20-year projection in 2008 dollars. In order to complete high priority projects within Bay City and to maintain the existing infrastructure, new revenues sources will be necessary. Both the establishment of a Transportation System Development Charge (SDC) and development of a road district show a potential for increased revenue income.

As the Refinement Plan will include a new list of needed transportation projects to serve growth through 2030, it will be necessary to identified revenue gaps and bridges for those gaps. Technical memorandum #2 includes a proposed project list with associated costs which has been updated with input from the PAC, the City Council, and the public. The list below is based on early technical analysis and the outcomes of the first two town hall meetings and the first four PAC meetings. Table 4-1 shows that the draft project list has a total cost of roughly $6,000,000, which may change before the adoption of the Final Transportation Refinement Plan.

Table 4-1. Draft Project Cost Estimates

Project	Draft Cost Estimate
Redesign of Warren and US 101 (aligning southern leg of Warren, adding a north bound left turn lane on US 101, and reducing northern leg of Warren to right out movements only)	$200,000
Redesign of Hayes Oyster and US 101	$2,000,000
Downtown streetscape	$2,500,000
Realign McCoy Street and US 101	200,000
Traffic calming on Williams and 16th	$9,000
Traffic calming on 4th	$8,000
Traffic calming at 5th and Hayes Oyster	$3,000
Pathway along rail road	$900,000
Pedestrian bridge at Hayes Oyster	$3,500,000[1]
Fifth Street Intersection with US Highway 101	ODOT[2]
Total[3]	**$5,820,000$**

Approximately $23,000 dollars of public funding per year will have been spent from 1998 through 2008 on transportation projects in Bay City. While available documentation indicated a few of the levels of government (City, County, or State) that provided the public funds, the

[1] Planned for long-term development, not included in constrained 20-year plan.

[2] To be completed by ODOT, in preparation for a jurisdictional transfer.

[3] Not including costs of improvements at 5th and Portland

specific programs associated with those funds were not consistently identified. Included below is a discussion of the most readily available sources of transportation funding for cities in Oregon. The City of Bay City should seek to familiarize themselves with programs they haven't used in the past to ensure they are maximizing funds available to complete priority projects. Further explanation on these sources is provided in Technical Memorandum #2.

4.2 STATE AND FEDERAL FUNDING

State and federal funding programs include:

1. Federal Surface Transportation Program/State Highway Funding
2. Special Small City Allotment (SCA)
3. Transportation Enhancement Program
4. Quick Fix
5. Scenic Byways
6. State Motor Vehicle Fund
7. Special Public Works Fund and Immediate Opportunity Fund
8. Oregon Transportation Infrastructure Bank (OTIB)
9. Oregon Immediate Opportunity Fund
10. Bicycle and Pedestrian Grant Program
11. Community Development Block Grants (CDBG)

4.3 LOCAL FUNDING

The list and paragraphs below summarize local options for funding projects in Bay City. Further explanation of these programs and funding options can be found in Technical Memorandum #2.

1. Local Property Tax Levies/Street Bonds
2. Local Improvement Districts (LID)
3. Reimbursement District or Zone of Benefit District
4. Road User, or Street Utility, Fees

4.3.1 Road District

Road districts may be created under Oregon Revised Statutes (ORS) 371.055 to 371.110 for the purpose of improving public roads within a city or drainage district. A road district can be superimposed over a part of a county as a means of levying a property tax for roads in addition to any overall county road levy. However, the historical experience has been that a county road district system is applied county-wide and replaces any county road levy program. Incorporated cities and certain drainage districts and islands are automatically separate road districts. Bay City would establish its own road district.

4.3.1.1 Applicability of a Road District

Road assessment districts may be formed under ORS 371.405 to 371.535 only in counties with a population between 19,000 and 25,000 at the time of formation. Subsequent growth to a population exceeding 25,000 has no effect on a properly formed district.

> ORS 371.410: Formation of road assessment district in counties with 19,000 to 25,000 population; effect of population increase. (1) A road assessment district may be formed in any county having a population of 19,000 and not more than 25,000, as shown by the decennial federal census, and shall consist of an area of more than 20,000 acres or an assessed valuation of taxable property of not less than $1 million, according to the last county assessment roll. A road assessment district may be formed to provide for the improvement, repair or reconstruction of the public roads within such area of land.

Tillamook County's population, as reported in the 2000 U.S. Census Bureau estimates, was 24,262 persons. So, the County would appear to qualify based on population. However, the Bureau's current estimate of population in the County is 25,038, so the 2010 Census is likely to show a County population higher than the 25,000 maximum to qualify for formation of a Road District. The district must have at least 20,000 acres or $1 million assessed valuation of taxable property. Tillamook County qualifies on both accounts.

Bay City could establish a road district in order to generate additional revenues for public works projects. The program should include a simple annual or bi-annual report, made available to residents, which shows the funds that were generated and the projects that were completed. The City staff and City Council could attempt to address the critical safety and capacity projects identified in this planning effort. However, the decision on the prioritization of projects should also be based on the principle of geographic equity. Each area of the City could be able to identify projects in their neighborhood that were funded by the program. This should help to minimize opposition to the new funding mechanism. Establishment of this program could also be hastened if it is coupled with the discontinuation of the street maintenance fee. While the work to establish this program should begin in 2010, the collection of new revenues could be postponed until a time of greater economic health in the State of Oregon and in Bay City.

Action: Initiate in 2010, the process to establish a road district, including a public outreach campaign.

4.4 TRANSPORTATION SYSTEM DEVELOPMENT CHARGES (SDC)

Transportation SDCs are fees paid by land developers to cover a portion of the increased system capacity needed to accommodate new development. Development charges are calculated to include the costs of impacts on services, such as increased school enrollment, parks and recreation use, or traffic congestion. A Transportation SDC is a one-time fee charged to new development that helps pay the costs of building transportation infrastructure (for example, roads or sidewalks) to support the overall transportation system. The City of Bay City does not currently utilize any Transportation SDC financing mechanisms.

The City of Bay City should adopt an improvement fee, Transportation SDC. Transportation SDC's would be collected on new development in Bay City, calculated based on equivalent dwelling units (EDU), with the number of trips generated by a new single family home equaling one (1) EDU. The Institute of Traffic Engineers (ITE) has produced a Trip Generation Manual which estimates the number of trips different types of development (for

example, restaurants, light industrial manufacturers, etc.) produce (ITE 2008). For fee assessment purposes, the number of trips a development produces is used to calculate its EDU number and Transportation SDC fee. The Transportation SDC rate for new development within Bay City would need to be calculated based on the final, adopted Improvement Project costs, and an assessment of future land use patterns and rates.

4.4.1 Step 1: Determine EDUs

Technical Memorandum #1 included a process for determining expected future growth in EDUs. Though the estimate was a legally defensible approach that meets the requirements of ORS 223.297–223.314, a more precise measurement of expected EDU growth is possible and is recommended for Bay City's Transportation SDC. An inventory of developable land within Bay City's Urban Growth Boundary (UGB) was developed in Technical Memorandum #1. This inventory was used to estimate the number of future trips expected to result from new development by 2030.

The Comprehensive Plan, adopted in 1978 and amended through 2007, generally supports a quiet residential nature for Bay City. It recommends that new development be limited. The plan also speaks to a high quality of life and natural resource protection. The population and employment projections described in Technical Memorandum #1 are shown in Table 4-2. There were 185 new residential units projected for the next 20 years, as well as three new restaurants, a bank, five retail/service businesses, and a small hotel. The data presented in Table 4-2 is based on rough estimates from the ITE Trip Generation Manual (ITE 2008); however, these only provide rough estimates. The different types of residential construction, different types of restaurants, etc. have potentially significant trip generation rates.

Table 4-2. Population and Employment Projections

Land Use Type (New Development)	Trip Generation/ Unit	Unit	Number of Units	Expected New trips (2030)	Expected New EDU's (2030)
Residential (Single-Family Detached Household)	9.57	per household	185	1770.45	185
Restaurants	89.95	per 1,000 sq ft	3	269.85	28
1 Bank/Credit Union	156.48	per 1,000 sq ft	1.5	234.72	25
5 Retail or Service Businesses	44.32	per 1,000 sq ft	9	398.88	42
Hotel	8.92	per occupied room	35	312.2	33
Total				**2986.1**	**313**

According to these initial estimates, there is expected to be a total of 2,986 trips generated by new development in Bay City. Of these, 1,770 would be residential and 1,216 would be non-residential. The expected increase by EDU is 313.

4.4.2 Step 2: Determine Cost of Infrastructure

4.4.2.1 Improvement Fee Cost Basis

Bay City's possible improvement fee would be based on a list of transportation projects needed to provide capacity for future development through 2030. As the Refinement Plan will include a new list of needed transportation projects to serve growth through 2030, it will be necessary to calculate an improvement fee cost basis to reflect these new costs. This memorandum includes a proposed project list with associated costs which will be updated with input from the PAC, the City Council, and the public. As projected growth will be approximately 30 percent of the total travel demand in 2030, 30 percent has been used in these early calculations. Table 4-3 shows that the draft project list has a total cost of roughly $6,000,000 which may change before the adoption of the Final Transportation Refinement Plan. The private share of such is projected to be $1,543,500. This equates to roughly a $5,000 SDC per household or EDU.

Table 4-3 is for illustrative purposes only. In order to develop and adopt an SDC program, a more rigorous analysis is needed. The analysis would have to assess each project for its capacity improvement potential, the degree to which it serves growth, the likelihood of state support, etc

Table 4-3. Draft Project Cost Estimates

Project	Draft Cost Estimate	Estimated State Share	Estimated State Contribution	Estimated Trips from New Development	Estimated Contribution from New Development
Redesign of Warren and US 101	$200,000	30%	$60,000	45%	$63,000
Redesign of Hayes Oyster and US 101	$2,000,000	25%	$500,000	30%	$450,000
Downtown streetscape	$2,500,000	5%	$125,000	30%	$712,500
Realign McCoy Street and US 101	200,000	20%	$40,000	30%	$48,000
Traffic calming on Williams and 16th	$9,000	0	0	0	$0
Traffic calming on 4th	$8,000	0	0	0	$0
Traffic calming at 5th and Hayes Oyster	$3,000	0	0	0	$0
Pathway along rail road	$900,000	0	0	30%	$270,000
Pedestrian bridge at Hayes Oyster	N/A	N/A	N/A	N/A	N/A
Fifth Street Intersection with US Highway 101	N/A	N/A	N/A	N/A	N/A
Total Costs	**$5,820,000**				**$1,543,500**
				Estimated Private Share	**$1,543,500**
				EDUs	**313**
				Private Contribution per EDU	**$4931.31**

4.4.3 Step 3: Determine the Transportation SDC Fee

As stated above, once the number of future trips (capacity basis) and infrastructure costs (cost basis) are known, the maximum imposable Transportation SDC fee is obtained by dividing the cost basis by the capacity basis. Though the City may charge the maximum Transportation SDC fees possible, the City may also choose to charge a lower fee per EDU.

The total private share of the draft list of capacity improvement projects is approximately $1,500,000. With only 313 EDUs in projected growth, this private share would be divided among a relatively low number of property owners/ developments. The estimated cost of each EDU is $5,000.

This would equate to a transportation system development charge for each new single family home of approximately $5,000. For a small subdivision of 8 houses, the charge would be $40,000. For a new retail store, the fee would be approximately $22,500 for every 1,000 square feet of space. For a new hotel of twenty five rooms, the charge would be approximately $112,500. As suggested above, this level of SDC may impede development.. It is recommended that a succinct public involvement program used to help determine an appropriate level of charges, perhaps using the charges to help shape and manage growth.

Action: Seek TGM program support or other means of developing and implementing an SDC program.

5. OTHER STRATEGIES

The City would like to slow traffic down to 45 miles per hour (mph) prior to Alderbrook Road as traffic enters the city's limits.

The posted speed on US 101 within the city limits is 45 mph. Similar to other communities on the Oregon Coast, However, the signs are not located far enough south so that drivers can view the sign before entering into the urbanized area. This is partly the result of annexation patterns and the "notch" of unincorporated land along US 101 to the south of the City. As is identified in the new Comprehensive Plan Transportation Policy, the City should also work with the County and the State Department of Transportation to request speed reductions on US 101 through the City of Bay City.

5.1 ON-STREET FACILITY EVALUATION AND MAINTENANCE

For on-street bikeway networks and sidewalks, key management and maintenance issues will include signage installation and maintenance, street sweeping, and pavement maintenance. Each of these management and maintenance activities should be completed in a consistent manner and on a regular basis. Many of the issues and strategies discussed below can be applied to off-street facilities as well.

5.2 OFF-STREET FACILITY EVALUATION AND MAINTENANCE

Proper maintenance of bicycle and pedestrian facilities is a critical element of providing a safe and user-friendly system. Table 5-1 summarizes a recommended maintenance schedule for the City's bicycle and pedestrian system. These guidelines address maintenance of the system's off-street portions.

Table 5-1. Sample Trail/Pathway Maintenance Guidelines

Maintenance Task	Frequency
Inspections	Seasonal, at both beginning and end of summer
Signage replacement	As needed when signs are missing or damaged
Site furnishings, replace damaged components	As needed
Pavement markings replacement	1-3 years or as markings became faded or illegible
Pavement blowing and /or sweeping	As needed; before high-use season and after major storm events; greater frequency in Fall may be required due to accumulation of leafy debris
Pavement sealing, pothole repair, pavement smoothing	Every 5-15 years
Lighting repair	Annually
Ensure bicycle detection at traffic signals	In response to citizen complaint or at the installation and replacement of actuated signals
Introduced tree and shrub plantings, trimming	Every 1-3 years
Shrub/tree irrigation for introduced planting areas	Weekly during summer months until plants are established
Shoulder plant trimming (weeds, trees, branches)	Twice a year; middle of growing season
Major damage response (fallen trees, washouts, flooding)	Schedule based on priorities

Maintenance Task	Frequency
Culvert inspection	Before rainy season; after major storms
Maintaining culvert inlets	Inspect before onset of wet season
Trash disposal	Twice monthly
Litter pick-up	Twice monthly
Graffiti removal	Weekly, or as needed

5.3 BIKE RACKS DOWNTOWN

At least one bike rack should be installed on each block of downtown Bay City. This does not eliminate the inclusion of requests from the public which do not fall in these areas. Areas officially designated or used as bicycle routes may warrant the consideration of more racks.

5.4 GRANT OPPORTUNITIES FOR OFF-ROAD TRAILS AND RAILS-TO-TRAILS PROJECT

The Bay City Refinement Plan PAC has identified a need for the completion of three major trail projects. The first project (a pathway along the railroad) is the only one of the three to be included in the Transportation Plan. The completion of the Jacoby Creek and Patterson Creek trails have been determined to be primarily recreation and parks projects and will not be considered in the financial evaluation of the transportation system. However, the project team assembled information on potential funding sources for these projects as well as the Rails-to-Trails project. City staff should consider the following resources for trail projects:

a. National Scenic Byways Grant Program

(a) Recreational Trail Grants

(b) Land and Water Conservation Fund (LWCF)

(c) Oregon Bicycle and Pedestrian Program

(d) Oregon State Lottery

5.5 UTILIZE THE 85% RULE TO FACILITATE/DIRECT PARKING MANAGEMENT STRATEGIES

The 85% Rule is a measure of parking utilization that acts as a benchmark against which parking management decisions are based. Within the parking industry, it is assumed that when an inventory of parking shows more than 85 percent occupancy in the peak hour, the supply becomes constrained and may not provide full and convenient access to its intended user. Once a supply of parking routinely exceeds 85 percent occupancy in the peak hour, the 85% Rule would require that parking management strategies be evaluated and/or implemented to bring peak hour occupancies to a level below 85 percent to assure intended uses are conveniently accommodated.

5.6 INITIATE DISCUSSIONS WITH DOWNTOWN BUSINESSES TO DEVELOP A "CUSTOMER FIRST" PARTNERSHIP AMONG DOWNTOWN BUSINESSES

"Customer First" partnerships are in place in other cities, whereby downtown businesses develop and sign a downtown partnership agreement that pledges that their business will actively promote short-term parking priorities in the downtown and aggressively work with their employees to either park off-street or take alternative transportation modes to work. "Customer First" programs are generally initiated in response to the adoption of a parking management plan and monitored through a downtown business association. Strong efforts should be made to assure that only short-term customers/visitors are using the on-street system in the commercial zone and that cooperative and coordinated programs are in place to assure residential priorities in the residentially zoned areas. If employees are misusing the on-street system, then programs and efforts should be made to mitigate problems.

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