

Revised Draft Report to



City of
Lake Oswego
For the



Transportation Management Plan for Downtown Neighborhoods

May 2006

Prepared by

DKS Associates
TRANSPORTATION SOLUTIONS

In association with:

Otak
MIG



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1. Executive Summary

Project Background

The Lake Oswego Transportation Management Plan for Downtown Neighborhoods was initiated as a citizen driven project to identify and analyze existing and potential future transportation impacts to the neighborhoods which surround downtown Lake Oswego. The study area focuses on the First Addition, Evergreen, Lakewood, Old Town and Foothills neighborhoods. Citizens in these neighborhoods have expressed concern that development in downtown Lake Oswego may impact the livability of their residential streets. This plan examines the traffic, walking, and parking conditions in the study area with the goal of managing both existing and future conditions.

Project Process

Central to the development and success of this plan was a public involvement process that included multiple opportunities for citizens to provide input and review of findings. This process included the formation of a Citizen Advisory Team (CAT) and a technical Working Team (WT), development of a project website, stakeholder interviews, public events, study area surveys, on-going contact with neighborhood leaders, and elementary school exercises. Five meetings with the CAT and WT, three public events, and stakeholder interviews were held to provide review of work products and guidance on the plan development. The project spanned approximately 12 months, with an anticipated completion date in May 2006. The key process steps include:

- **Gathering Information:** Citizen issue identification and data collection
- **Stakeholder Contact:** Stakeholder interviews to identify issues
- **Goals:** Development of plan principles, goals and desired outcomes
- **Analysis:** Technical analysis to verify existing and future issues
- **Developing and Prioritizing Alternatives:** Develop alternatives to address verified issues and identify the high priority projects
- **Plan Development:** Iterative review process to develop a Transportation Management Plan (TMP)



Project Goals

Early in the planning process and in coordination with the CAT and WT, project principles, goals, and desired outcomes were developed to guide the plan development. The plan principles included managing traffic and driver behavior, encouraging walking and biking, managing parking, and improving storm drainage. The desired outcomes of the plan included the development of action plans to address existing issues and address future needs.

Plan goals were developed to guide plan development and address the issues identified within the neighborhoods. The five plan goals include:

- *Accessibility:* Develop facilities that are accessible for all persons – young, elderly and those with mobility limitations, for emergency service providers, for basic service providers (e.g. garbage trucks and school buses) and for all individuals.
- *Safety:* Improve safety for all modes of travel (pedestrians, motor vehicles, bicycles), including safe routes to school.
- *Character:* Maintain and enhance the aesthetic qualities of the neighborhoods surrounding downtown, appropriate for Lake Oswego.
- *Information:* Collect data to create an accurate picture of current dynamics and develop an educated forecast for the future.
- *Community Involvement:* Involve neighbors, to the greatest extent possible, in data collection and strategy decisions.

Analysis Findings

Working with citizens and City staff, a broad range of concerns were identified, including cut-through traffic, vehicle speeding, lack of compliance with stop-signs, lack of safe pedestrian facilities (including safe routes to school), and parking overflow from the downtown in the surrounding neighborhoods. An extensive technical analysis (including collecting traffic counts, forecasting future traffic, and surveying parking conditions) was completed to research these issues. Based on that analysis, the following key findings were made:

Traffic Calming Issues

- Motor vehicle speeding and cut-through issues exist today on some streets within the study area (North Shore, C Avenue west of 10th, Westward Ho, 4th Street, and Bayberry west of 10th). However, there is potential for traffic levels to increase significantly on several local streets in the future due to arterial congestion (C, D, and E Avenues between State and County Club, North Shore, Durham).
- Many of the streets in neighborhoods near downtown have had stable



volume and speeds over the last 10 years. Notable exceptions include North Shore and C Avenue west of 10th.

- Growth in downtown Lake Oswego would have less of an impact upon traffic in the surrounding neighborhoods than growth outside of the study area (sub-regional).
- Traffic calming treatments could manage and reduce (but not eliminate) growth of cut-through traffic.
- The key to managing traffic growth in the downtown area will be monitoring conditions on study area streets and targeting actions to address changes in conditions.

Walking Issues

- Pedestrian facilities are generally provided in the downtown commercial core area.
- There is a lack of separate walking space that would serve as a safe route to school for Forest Hills Elementary.
- Several pathway connections, including some already identified in neighborhood plans, would enhance connections between downtown and the surrounding residential areas and would provide key links between pedestrian generators (including safe routes to schools). These routes include 10th Street, Evergreen Road, and E Avenue.

Parking Issues

- As a whole, there is adequate parking supply in downtown Lake Oswego to serve existing demand. However, there are a few focused areas that experience high levels of parking occupancy (such as areas near the Post Office, Transit Center, and Library).
- City Code minimum off-street parking requirements will increase the parking supply less than the anticipated future increase in parking demand. On-street occupancy levels will increase during peak times and more high parking occupancy issue areas will be realized. However, the overall study area parking supply will still be adequate. Parking time restrictions should be comprehensively reviewed.
- Provision of parking site by site (as per existing code) may not produce the pedestrian friendly environment desired for downtown. Alternatives (such as consolidated, centralized parking and in-lieu fees) should be considered.



Plan Outcomes

In October 2005, an open house was held to present issue analysis findings to citizens and to engage them in the identification of alternative solutions. The citizens were asked to select preferred tools to address the study area issues and to develop improvement alternatives using these tools for their neighborhoods. The preferred tools selected by citizens include:

- Traffic circles, curb extensions, neighborhood gateway treatments, intersection alignment corrections, and diverters. Speed humps were not generally desired, but were selected for a few projects.
- Consistent stop sign placement strategies.
- Continuous pathways that are not curbed and include separation between the pathway and the roadway.
- Consolidated parking in-lieu of individual development parking.

Recommended alternatives were developed and then prioritized into short-term and long-term action plans. Short-term projects are those which address a confirmed and existing need. Long-term projects typically address anticipated but not confirmed conditions or otherwise require data collection or policy changes to implement. Although there are no current funding sources identified to implement the recommended action plans, cost estimates were prepared to provide a framework for funding discussion. The short-term improvements should be considered in City capital funding programs.

Although growth from downtown development was forecasted to have limited impact on the surrounding neighborhoods, continued sub-regional growth will create potential future needs that will need to be monitored as downtown growth occurs. To implement these plans and monitor future growth, implementation strategies were recommended to establish new city policies, assess project funding, and manage capital project implementation. These strategies include:

- *Monitor Downtown Growth* – Adopt code requirements for local street analysis in traffic impact studies required for major new developments or establish a City implemented monitoring program. Utilize the existing City traffic calming policy to establish performance measures.
- *Establish Parking Policy* – Work with downtown businesses to determine if future off-street parking should be provided by each new development or a centralized public parking facility. Conduct a comprehensive review of on-street parking time limits in the downtown area.
- *Utilize Existing City Programs for Implementation of Short-Term Recommendations* – Several existing City programs (NTMP, CIP, and Neighborhood Pathway Program) include a process and potential funding sources to implement recommendations of the action plans. These are



citywide programs with competitive/limited funding sources. This study forwards several possible projects for consideration.

- *Pursue Alternative Funding Source* – There are several options that could be pursued to fund recommendations of the action plans, including development mitigation requirements (utilizing the recommendations of this plan), Local Improvement Districts (LID), Capital Improvement Programs, Urban Renewal Funds, Safe Routes to School Grants (SR2S), and parking development fees (in-lieu of providing on-site parking). Each of these should be pursued as necessary.
- *Project Phasing* - Project phasing should be used to focus investment and provide the opportunity for project review prior to wide-spread investment
- *Before/After Studies* - A key to successfully implementing a long-term action plan in the study area will be monitoring the benefits and public satisfaction of each project. Feedback from the studies can be used to improve or revise subsequent projects.
- *High-Priority Projects* – Neighbors and City staff have identified four action plan recommendations that should be the first project pursued for implementation (First Additional Stop Sign Strategy, Ellis Temporary Intersection Improvements, A Avenue Crossing Enhancements, and E Avenue Pathway).

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Downtown Area-Wide Transportation Management Plan

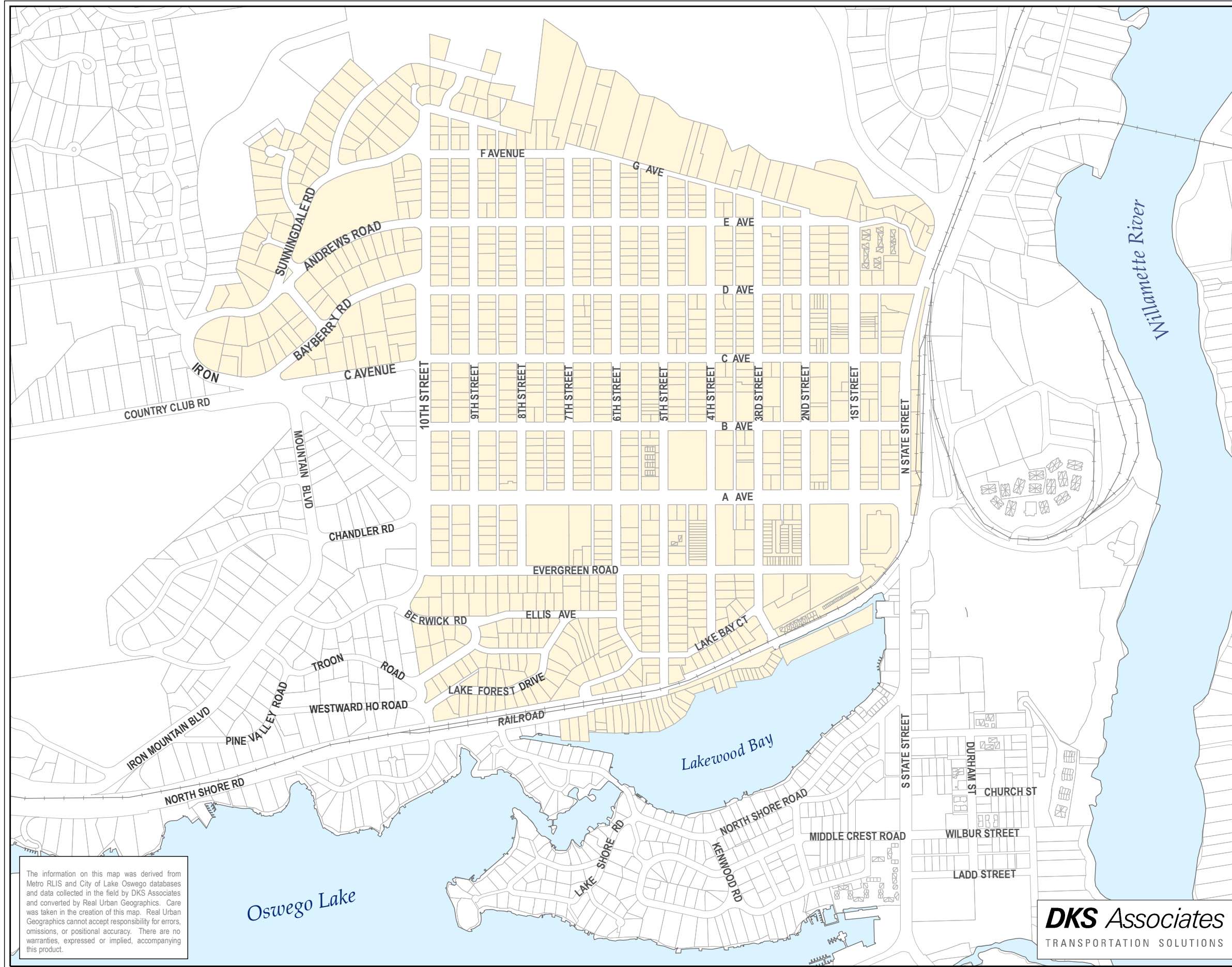


FIGURE 2 - 1

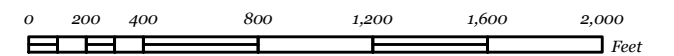
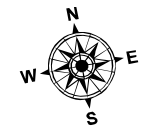
Study Area

Legend

-  STUDY AREA
-  TAXLOTS
-  RAILROAD



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Advisory Teams

A Citizen Advisory Team (CAT) was formed and charged with guiding the project by acting as representatives of their constituencies and assuring the participation of all interested parties. Members of the team included representatives from neighborhood associations, Forest Hills and Our Lady of the Lake schools, the Adult Community Center, the Transportation Advisory Board, the Lake Oswego Neighborhood Action Coalition (LONAC), the library board, the Downtown Business District Association, and the Chamber of Commerce. This group met several times over the course of the project to provide input on each aspect of the plan development.

In addition to the CAT, a Working Team (WT) was created with City staff to provide review of the plan development, share insights about the study area, and guide the plan development to reach outcomes that can be implemented. Members of this group included staff from engineering, planning, redevelopment, and the City Manager's office.

Public Events

Public forum events were held as part of the project to allow neighbors to provide input about study area issues, desired outcomes, and to review the draft plan.

The first public event, held in May 2005, included a presentation by Dan Burden, who is a nationally recognized authority of livable communities¹. Mr. Burden's presentation to neighbors in the study area provided a traffic calming and neighborhood design education that provided a foundation for understanding neighborhood issues and methods for improving livability. The second public event, held in October 2006, included a presentation of study area analysis findings and a working session with citizens to develop improvement alternatives. A third public event was held March 2006 to review the plan.



Dan Burden Presentation – May 2005

Project Website

To support citizen involvement in the project (in addition to the CAT meetings and public events), a project website was created on the City's webpage to provide opportunity for neighbors to review project material and provide comments. The website included information such as meeting notices, meeting minutes, project information, and contact information. In addition, the website included project data, such as collected traffic data, photos, mapping, and links to related websites.

¹ Further information about Dan Burden can be found at www.walkable.org



Informational Articles

Throughout the course of the project, several articles were published that provided neighbors project information and listed participation opportunities. These articles include:

- Hello LO, May 2005 – Neighborhood Forum Announcement
- Hello LO, October 2005 – Project Overview and Neighborhood Forum Announcement
- Lake Oswego Review, November 24, 2005 – Project Overview

Stakeholder Interviews

Key stakeholders including downtown business owners, City staff, and service providers with interest in the downtown area transportation system were involved through one-on-one stakeholder interviews. The interviews included questions about study area issues, stakeholder needs, and design standards for transportation improvements. Key groups interviewed include the Bicycle Transportation Alliance, Rossman Sanitary Services, Gramor Development, Lake Oswego Fire Department, and Lake Oswego Review.

Study Area Surveys

In addition to gathering citizen input at public meetings, surveys were utilized to allow neighbors to evaluate the traffic conditions, safety, and character of their streets. These surveys were distributed at the first public event in May 2005 and were subsequently distributed to neighbors during neighborhood meetings. A similar survey was used in fall 2005 as part of the national Walk to School week to survey parents about the routes their children use to walk to school. In total, 42 surveys responses were collected. These surveys found that, in general, local streets were considered to be comfortable for citizens. In a few locations, issues such as cut-through traffic and speed were highlighted. The findings of these surveys were compiled as part of the issue identification effort in the study area.

Elementary School Exercise

During spring 2005, a student exercise was conducted with 4th grade classes at Forest Hills Elementary School (located in the northwest corner of the study area). The objective of the exercise was to have students share their perspective on the character and safety of the route they use to get to school (walking, biking, or as an auto passenger). The results of the exercise were posted at the first public event, held in May 2005, providing input into issue identification in the study area.



Route to School Exercise – Spring 2005



Background Research

The development of this plan began with the review of the historical involvement between the neighborhood surrounding downtown and city staff. This involvement culminated in the development of several plans and documents, including:

- First Addition Neighborhood Plan
- Evergreen Neighborhood Plan
- Old Town Neighborhood Plan
- City of Lake Oswego Neighborhood Traffic Management Plan
- City of Lake Oswego Transportation System Plan
- City of Lake Oswego Capital Improvement Plan
- City of Lake Oswego City Code
- City of Lake Oswego Community Development Code
- Forest Hills Elementary Traffic Study
- City of Lake Oswego East End Redevelopment Plan
- City of Lake Oswego Trails and Pathways Master Plan

Information from these plans were combined with transportation data collected by the City of Lake Oswego (e.g. traffic volumes, traffic speeds, street widths, sidewalk locations) to develop an understanding of the historical and current conditions in the study area.

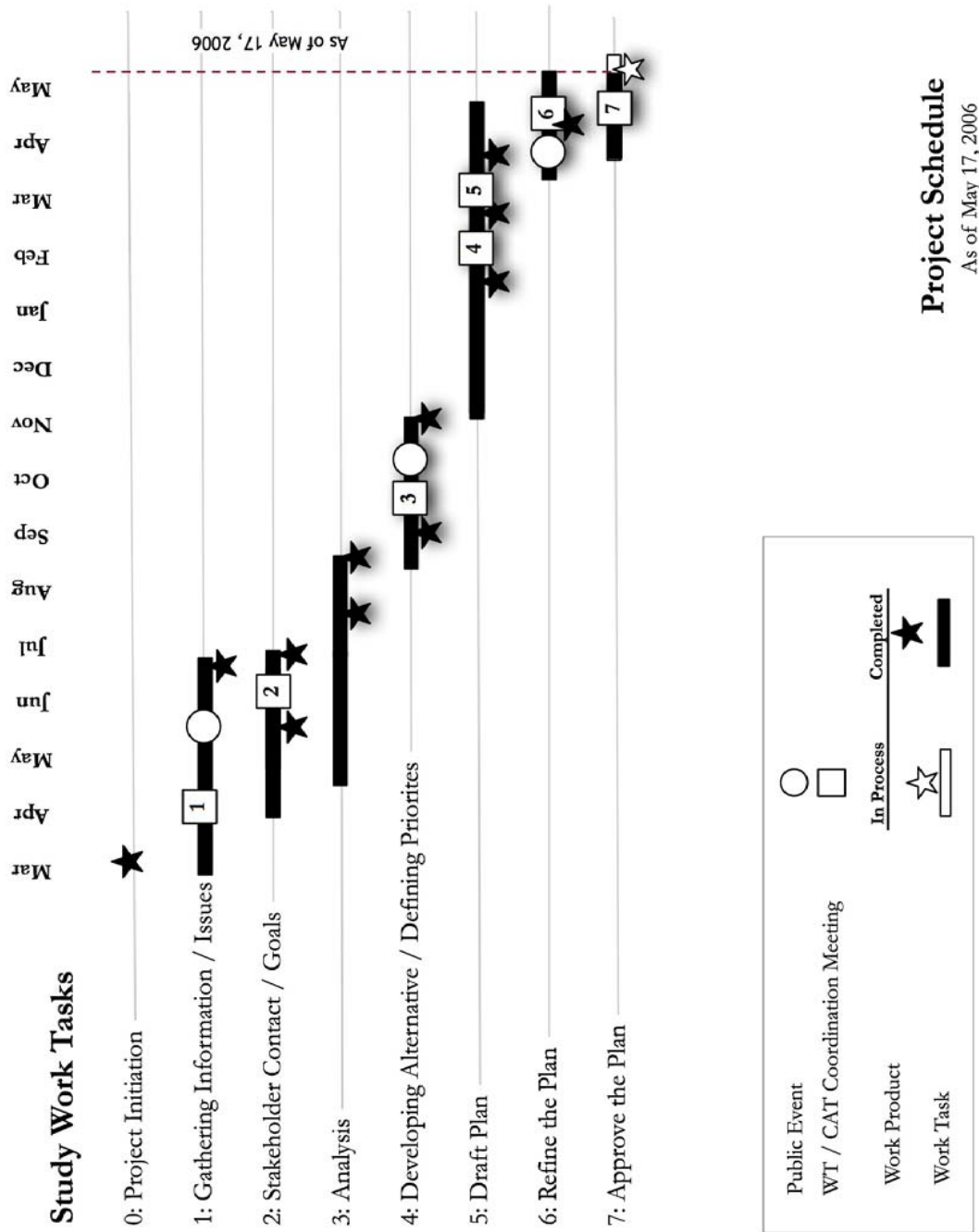
Project Process and Schedule

Figure 2-2 shows the project schedule and provides an overview of the plan development process. Included in this process are periodic meetings with the CAT and WT, three public events, and stakeholder interviews to provide review of work products and guidance on the plan development. The project schedule covers approximately 12 months, with an anticipated completion date in May 2006. The key process steps include:

- **Gathering Information:** Citizen issue identification and data collection
- **Stakeholder Contact:** Stakeholder interviews to identify issues
- **Goals:** Development of plan principles, goals and desired outcomes
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Figure 2-2: Project Schedule and Process





Project Principles, Goals, and Outcomes

Project Principles

Staff worked with the CAT to identify the four main principles for the plan. They were:

- Manage cut through vehicle traffic, speeding and the running of stop signs.
- Encourage walking and biking.
- Minimize parking intrusion from the business district into neighborhoods.
- Improve storm drainage of paved areas.

Project Goals

In coordination with the CAT and WT, a series of goals were developed to guide plan development and address the traffic, walking, and parking issues identified within the neighborhoods. The five plan goals include:

- *Accessibility:* Develop facilities that are accessible for all persons – young, elderly and those with mobility limitations, for emergency service providers, for basic service providers (e.g. garbage trucks and school buses) and for all individuals.



- *Safety:* Improve safety for all modes of travel (pedestrians, motor vehicles, bicycles), including safe routes to school.

- *Character:* Maintain and enhance the aesthetic qualities of the neighborhoods surrounding downtown, appropriate for Lake Oswego.





- *Information:* Collect data to create an accurate picture of current dynamics and develop an educated forecast for the future.
- *Community Involvement:* Involve neighbors, to the greatest extent possible, in data collection and strategy decisions.

Project Outcomes

The CAT and WT also identified the desired outcomes for this plan. They include:

- Develop a list of short term and long term actions to address existing needs.
- Prepare policies to address future needs with triggers that implement anticipated strategies.



3. Gathering Information

Issue Identification

Through the public involvement process described in Chapter 2 and coordination with City staff, a detailed list of transportation issues in the study area was compiled to guide the technical analysis and alternative development aspect of the plan. Table 3-1 lists the major issues identified in three categories: traffic, walking, and parking. A detailed list of the issues can be found in the public involvement report provided as Appendix A.



Neighborhood Walking Tour with Dan Burden and City Staff – Spring 2005

Table 3-1: Neighborhood Transportation Issues

| Topic | Issue |
|----------------|---|
| Traffic | <ul style="list-style-type: none"> ▪ Cut-through traffic¹ on C Avenue, D Avenue, 1st Street, 4th Street, 10th Street, North Shore Road, Westward Ho, Pine Valley, and Durham Street ▪ High traffic speeds on 10th Street, C Avenue, D Avenue, E Avenue, Ellis Avenue, Westward Ho, and 4th Street and 6th Street south of A Avenue ▪ Stop sign compliance in the Evergreen neighborhood (driver behavior) at Ellis/Berwick and Ellis/Lake Forest ▪ Inconsistent stop signs in the First Addition neighborhood ▪ Congestion at State/A and Country Club/Iron Mountain ▪ Concern with future road extensions across State Street to the east impacting residential streets ▪ Traffic flow around Forest Hills Elementary School ▪ Concern with speed hump's impact on street character |

¹ Cut-through traffic was defined as trips traveling through a neighborhood that do not originate or terminate within the neighborhood. This could include trips from other parts of Lake Oswego or regional traffic coming through downtown Lake Oswego. For example, a trip from the Evergreen neighborhood to the Adult Community Center that travels on 4th Street would not be considered a cut-through trip in FAN. However, a trip starting in Portland and destined to Kruse Way that avoids A Avenue by traveling on D Avenue between State Street and County Club Road is a cut-through trip on D Avenue.



| Topic | Issue |
|-----------------------|---|
| <p>Walking</p> | <ul style="list-style-type: none"> ▪ Lack of safe routes to schools ▪ Dangerous pedestrian crossings of major streets ▪ Lack of safe routes to the Library and Adult Community Center ▪ Country-lane character of streets is important to the neighborhoods ▪ Lack of through corridor connections to downtown ▪ Pedestrians compete with autos for space on narrow streets ▪ Storm drainage issues with paved areas ▪ Lack of accessibility to sidewalks and fountains |
| <p>Parking</p> | <ul style="list-style-type: none"> ▪ Overflow of commercial area parking into surrounding neighborhood areas (including employee parking behavior) ▪ Transit center parking occupying on-street parking used for business and overflowing into the neighborhood ▪ Special event parking overflow from Millennium Park (e.g. Farmers Market) into surrounding neighborhood areas ▪ Overflow of parking at the Post Office and the Library |



4. Analysis

Introduction

The extensive public involvement process described in Chapter 2 resulted in a list of citizen-identified transportation concerns (Chapter 3 and Appendix A). The next step in the process was the execution of a detailed transportation analysis of the study area. The purpose of that analysis was to:

1. Highlight any additional issues not previously identified,
2. Produce measurements of the concerns identified by neighbors and stakeholders providing qualification and validation of issues, and
3. Estimate future transportation conditions that could be anticipated given growth in the downtown area.

Technical data was collected and computer models were developed to assist with this analysis.

Existing Conditions

This section summarizes the existing conditions that were evaluated in the downtown neighborhood study area, including motor vehicle speed, volume, crashes and traffic control, pedestrian/bicycle facilities and volumes and parking. Data was gathered from historical city files, field observations, Metro GIS data, Lake Oswego Police Department data, ODOT data, and citizen parking surveys. More detailed analysis can be found in the technical appendix.

Motor Vehicles

This section summarizes motor vehicle data that was collected to supplement historical information provided by the City of Lake Oswego. In addition, crash history and compliance with stop sign regulations were examined.



Vehicle Speeds

Motor vehicle speeds were observed over a 24-hour period throughout the study area. Figure 4-1 shows motor vehicle 85th percentile speeds¹ collected during spring and fall 2005. The figure also presents historical data collected by the City between 1997 and 2000. The majority of streets in the study area have maintained motor vehicle speeds below the 28 mph level².

Speed surveys were also examined to identify locations where speeding above 30 mph may be an issue. In general, most streets have 85th percentile vehicle speeds below 28 mph, which likely is the result of desirable neighborhood street characteristics (e.g., narrow roadways and landscaping). Speeding at this level is considered significant because of the relationship between motor vehicle speeds and pedestrian fatality. Below 30 mph, more than 80 percent of pedestrians survive. Above 30 mph, survival rates decline to 70 percent at 35 mph and 60 percent at 40 mph.³ Two locations (C west of 10th and Westward Ho east of Pine Valley) were found to have speeding levels above 30 mph. C Avenue west of 10th Street experiences the highest level of speeding, with approximately 20 percent of vehicles exceeding 30 mph.

Based on this analysis, the following locations were found to exceed the 85th percentile speed and/or 30 mph level speed evaluation criteria:

- C Avenue west of 10th Street (85th Percentile = 32 mph and 20% exceeding 30 mph)
- Westward Ho east of Pine Valley (85th Percentile = 28 mph and 2% exceeding 30 mph)

¹ 85th percentile speeds are determined by using roadway-tube counters that track vehicles speeds over a 24-hour period. The 85th percentile speed is the speed that 85% of the vehicles travel at or below. This value is a common statistic in evaluating roadway speed.

² 28 mph is a threshold set by City code in the Neighborhood Traffic Management Program (LOC 32.14)

³ Insurance Institute Highway Safety, Status Report 35 (5), May 13, 2000.

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Downtown Area-Wide
Transportation
Management Plan



FIGURE 4 - 1

Vehicle Speeds

Legend

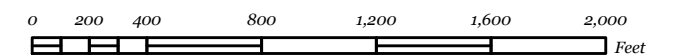
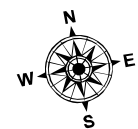
Posted Speeds

- 20 MPH
- 25 MPH
- 30 MPH
- 35 MPH
- 40 MPH

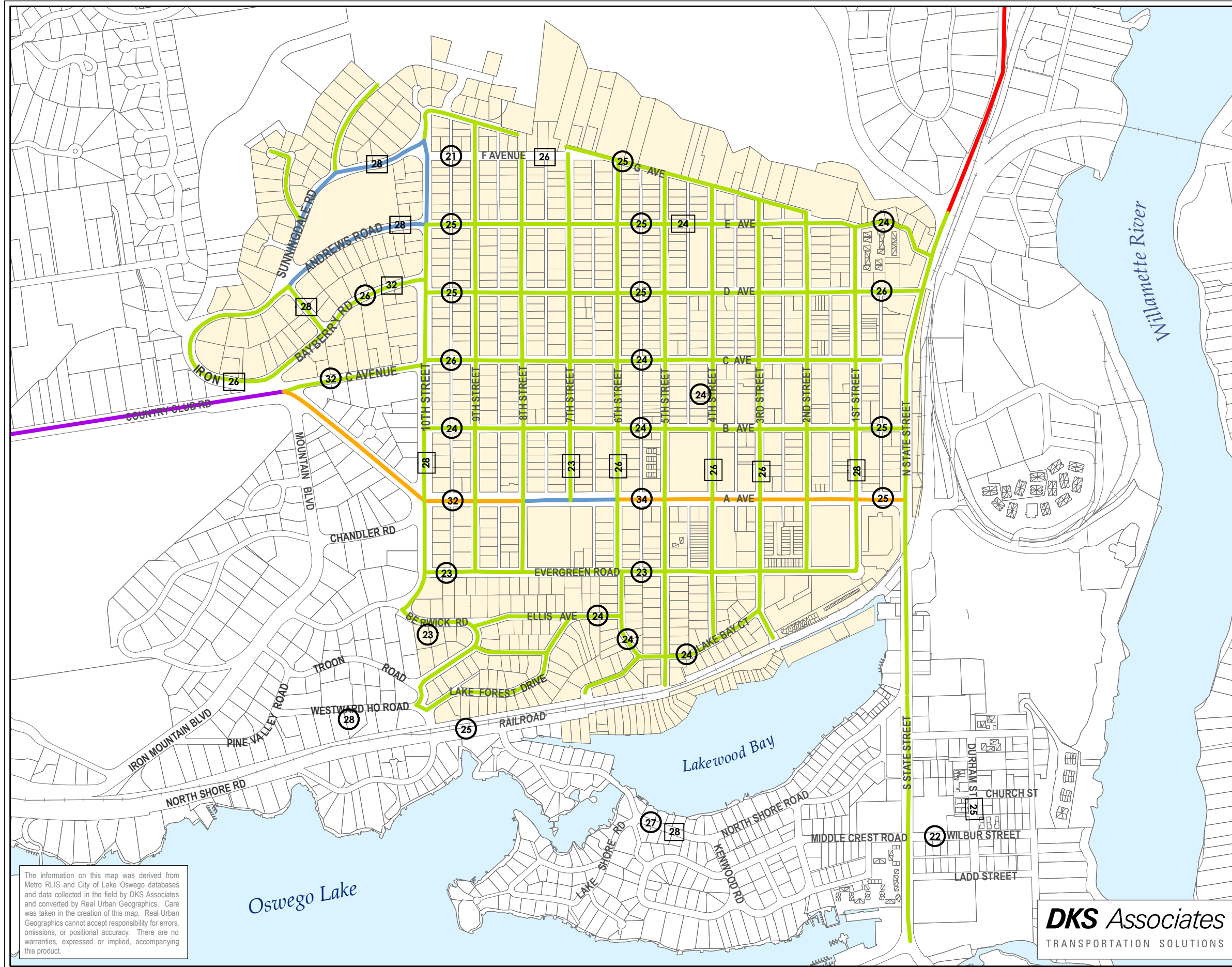
Observed Speeds, 85th Percentile*

- 25 CURRENT 2005 OBSERVATIONS
 - 25 HISTORICAL DATA (collected between 1997 and 2000)
- *maximum speed at which 85 of 100 vehicles travel

- STUDY AREA
- TAXLOTS
- RAILROAD



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Vehicle Volumes

Motor vehicle volumes were collected during spring 2005 and are shown on Figure 4-2. Historical volumes and roadway functional class are also shown on the figure. Daily volumes throughout the study area neighborhoods appear to have remained fairly consistent over the past 5 to 10 years, with a few exceptions. Both C Avenue west of 10th Street and North Shore Road increased by approximately 25%. These locations also exceed the desirable weekday traffic levels for a local street⁴. Based on this data, the following locations exceed the evaluation criteria for traffic volume:

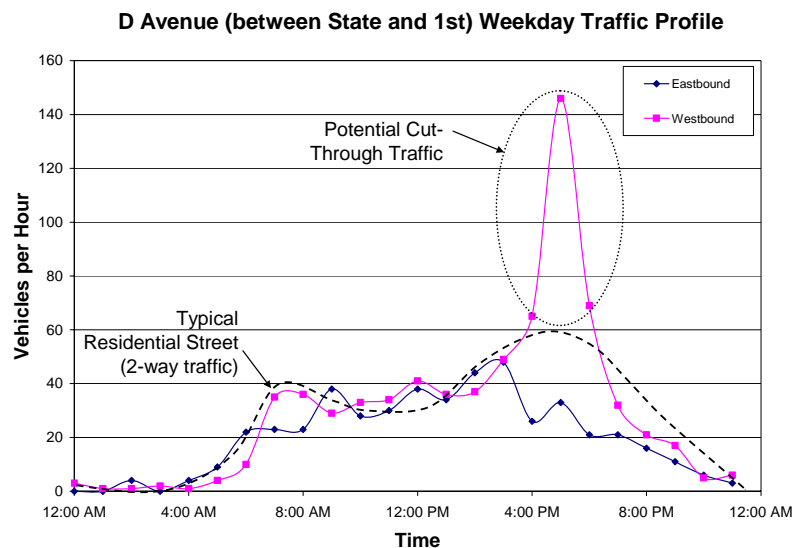
- C Avenue west of 10th Street (1,470 vehicles per day)
- North Shore Road near Kenwood (1,850 vehicles per day)
- 4th Street north of B Avenue (2,150 vehicles per day)
- Bayberry west of 10th Street (1,260 vehicles per day)

Within the study area, traffic volume changes on arterial streets provides another picture of historic patterns. Since 1994, daily traffic on State Street at A Avenue has increased from 34,000 to 37,000 in 2004 (9% growth in 10 years).

Cut-Through Traffic

Volume Measurements

Cut-through traffic was also evaluated in the downtown neighborhoods based on several factors, including traffic volume profiles, existing traffic patterns, and travel times. The level of traffic volume on C Avenue west of 10th Street and North Shore Road reflect streets impacted by cut-through traffic since they have volume levels reaching 1,500 vehicles day without providing service to major trip generators (other roadways in the study were found to have daily traffic volume levels more commensurate to the surrounding land uses). Several other roadways in the study area were identified by citizens as locations of cut-through traffic, particularly during the PM peak period in the First Addition neighborhood. The 24-hour vehicle counts were examined to identify roadways with traffic surges (usually in one direction) during the peak hour (see the volume profile graphic above). For example,



⁴ The City of Lake Oswego Comprehensive Plan recommends that the volume of traffic on local neighborhood streets remain below 1,200 ADT (average daily traffic)



the unique profile of excess traffic in the peak hour identified cut-through activity on some streets (D Avenue shown above). When compiled, the data shows that in First Addition, PM peak hour cut-through traffic is experienced on B Avenue, C Avenue, D Avenue, E Avenue, and Bayberry Road, particularly near 1st Street and 10th Street. Surges in the center of First Addition (near 5th Street) are experienced on E Avenue, D Avenue, and C Avenue (listed in order of significance). Therefore, E Avenue and D Avenue appear to be the most significant cut-through routes. While the total daily volumes on most of these roadways do not currently exceed standard evaluation criteria, the cut-through traffic in the PM peak hour suggests the potential for traffic volume issues in the future as arterial congestion increases.

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Downtown Area-Wide Transportation Management Plan



FIGURE 4 - 2

Roadway Functional Class and Traffic Volumes

Legend

Average Daily Traffic Volume (ADT)

- 585 CURRENT 2005 OBSERVATIONS
- 585 HISTORICAL DATA (collected between 1997 and 2000)

Functional Classification

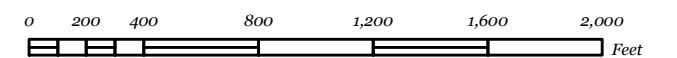
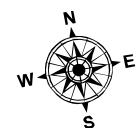
- MAJOR ARTERIAL
- MINOR ARTERIAL
- MAJOR COLLECTOR
- NEIGHBORHOOD COLLECTOR

STUDY AREA

TAXLOTS

RAILROAD

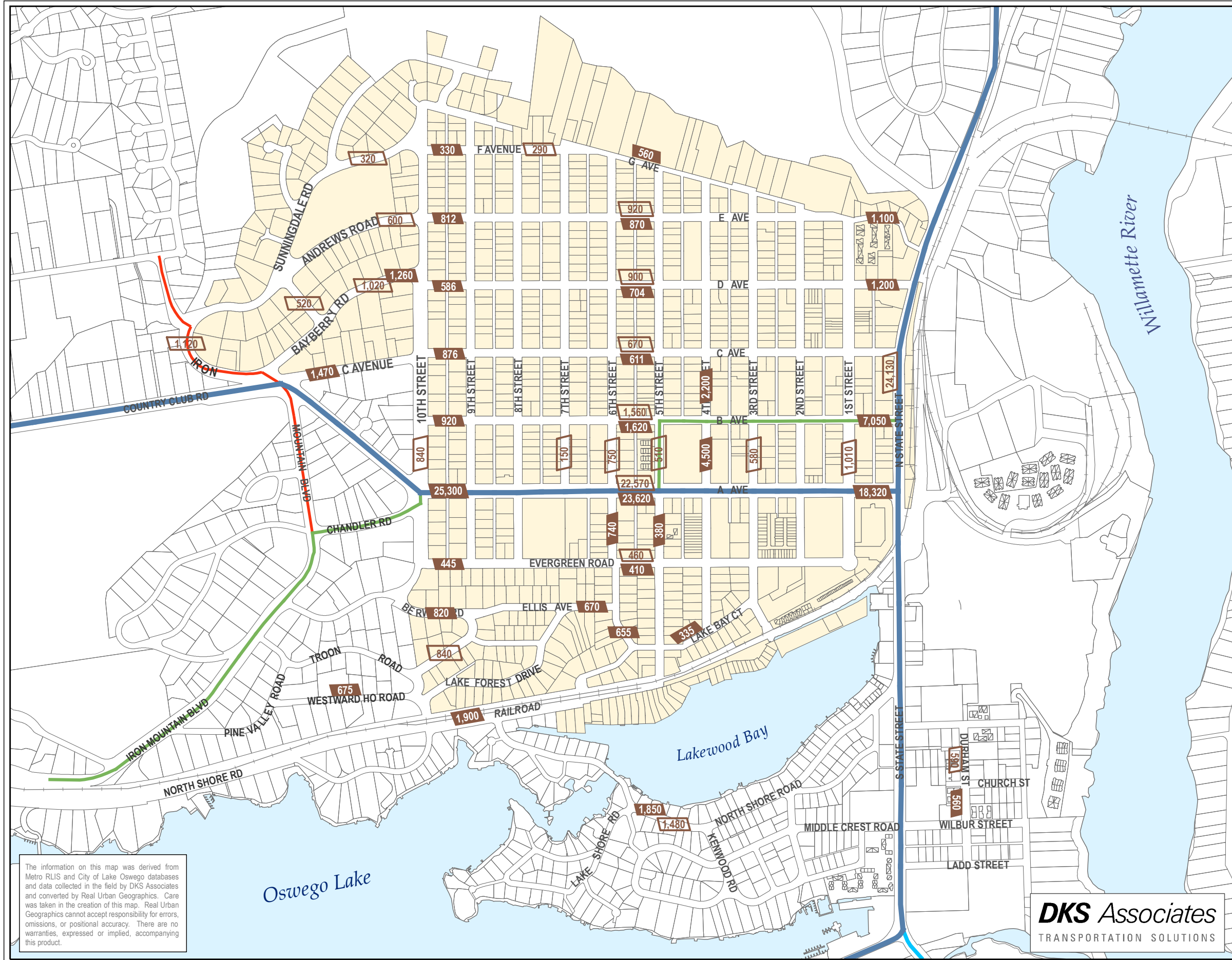
Note: Neighborhood Collectors typically carry 1,000 to 3,000 vehicles per day. Local Residential Streets typically carry 1,200 or fewer vehicles per day.



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Flow Patterns

To better understand the flow of the peak hour cut-through traffic in First Addition, peak hour intersection turn movement data along D Avenue and B Avenue (between 1st Street and 5th Street) was examined to identify flow patterns. The westbound traffic flow along both D Avenue and B Avenue during the PM peak hour exhibits a strong southwestern flow pattern, which would correspond to traffic between State Street and A Avenue that diverts diagonally through local streets. This flow pattern provides guidance for potential locations of gateway treatments between First Addition and State Street (between 1st Street and 2nd Street).



Southwest Traffic Flow Pattern

The traffic flow pattern identified on D Avenue and B Avenue also points to the importance of B Avenue as a relief route for A Avenue. However, if measures were implemented to stop or delay vehicles on B Avenue between 1st Street and 4th Street (e.g. all-way stops), there could be traffic diversion to other roadways through First Addition (e.g., C, D, and E Avenues).

Test Runs

To understand why vehicles would cut-through on local streets in the First Addition, Evergreen and Lakewood neighborhoods, test runs were conducted between State Street and Six Corners (Iron Mountain/Country Club) to measure travel times. During non-peak hours, travel time from 6 Corners to State Street north of A Avenue is approximately 3 minutes via either A Avenue or through First Addition local streets. As peak hour congestion slows speeds on A Avenue, the local streets through First Addition can be a faster option even without speeding by driving 25 mph.



PM peak hour traffic in FAN

From Six Corners to State Street south of A Avenue (near Village Shopping Center at North Shore Road), non-peak travel times is approximately 4 minutes via either A Avenue or North Shore/Berwick/10th. As congestion slows A Avenue traffic during peak times, traveling through the Lakewood and Evergreen neighborhoods via North Shore and connecting routes



(e.g. Berwick and 10th) is a faster and more reliable option (travel times can vary from 3 to 7 minutes via A and State, but remain reliably about 4 minutes via North Shore). As arterial traffic volumes increase in the future and congestion on A Avenue worsens, saving time by traveling through local streets could become an increasingly attractive option for drivers.

Based on this analysis using volume measurements, flow patterns, and test runs, the following locations were verified to experience cut-through traffic:

- North Shore Road near Kenwood (both directions, daily)
- C Avenue and Bayberry Road west of 10th Street (eastbound, PM peak hour)
- B Avenue and C Avenue east of 10th Street (eastbound, PM peak hour)
- B Avenue, D Avenue, and E Avenue west of State Street (westbound, PM peak hour)

Traffic Control

In both the First Addition and Evergreen neighborhoods, citizens noted non-compliance with stop signs and an inconsistent pattern of stop signs. Figure 4-3 shows the current location of traffic controls in the study area. Over time, stop signs have been added in the First Addition and Evergreen neighborhoods in response to citizen concerns. This has resulted in an irregular pattern of traffic control.

To analyze this issue, intersection turn movement counts were conducted in First Addition to determine where all-way stop signs were warranted (based on Manual on Uniform Traffic Control Devices traffic volume warrants). The analysis found that the intersection of 4th/B is the only intersection that meets all-way stop volume warrants with existing motor vehicle traffic levels.

Within First Addition, there were several local street intersections with crash rates significantly higher than other local streets in the study area. Several of these locations (9th/C, 7th/C, 6th/D, 6th/E) are at intersections without stop signs on any approach (traffic is yield controlled). Compared to surrounding intersections with stop signs and similar levels of motor vehicle volume, it appears that the lack of two-way stop sign control (all-way stops are not warranted at these locations) may be a factor in crash rates.



Stop Sign Control

In the Evergreen neighborhood, the intersections of Ellis/Berwick and Ellis/Lake Forest Drive were observed during a weekday afternoon to determine the portion of drivers that come to a complete stop. At Ellis/Berwick, 30 to 50% of vehicles observed came to a complete stop. At Ellis/Lake Forest Drive, only 35% of vehicles observed came to a complete stop. This behavior may be aggravated by the wide intersection geometry and non-rectangular geometry at these locations.

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Downtown Area-Wide Transportation Management Plan



FIGURE 4 - 3

Traffic Management and Emergency Routes

Legend

Emergency Response

Primary Emergency Response Routes

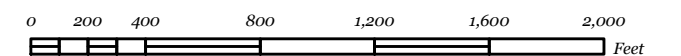
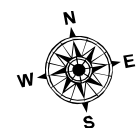
Traffic Measures and Controls

- Diverter
- Traffic from this direction is allowed
- Traffic Circle
- 46" Local Speed Hump
- Stop Sign
- Traffic Signal
- Channelization

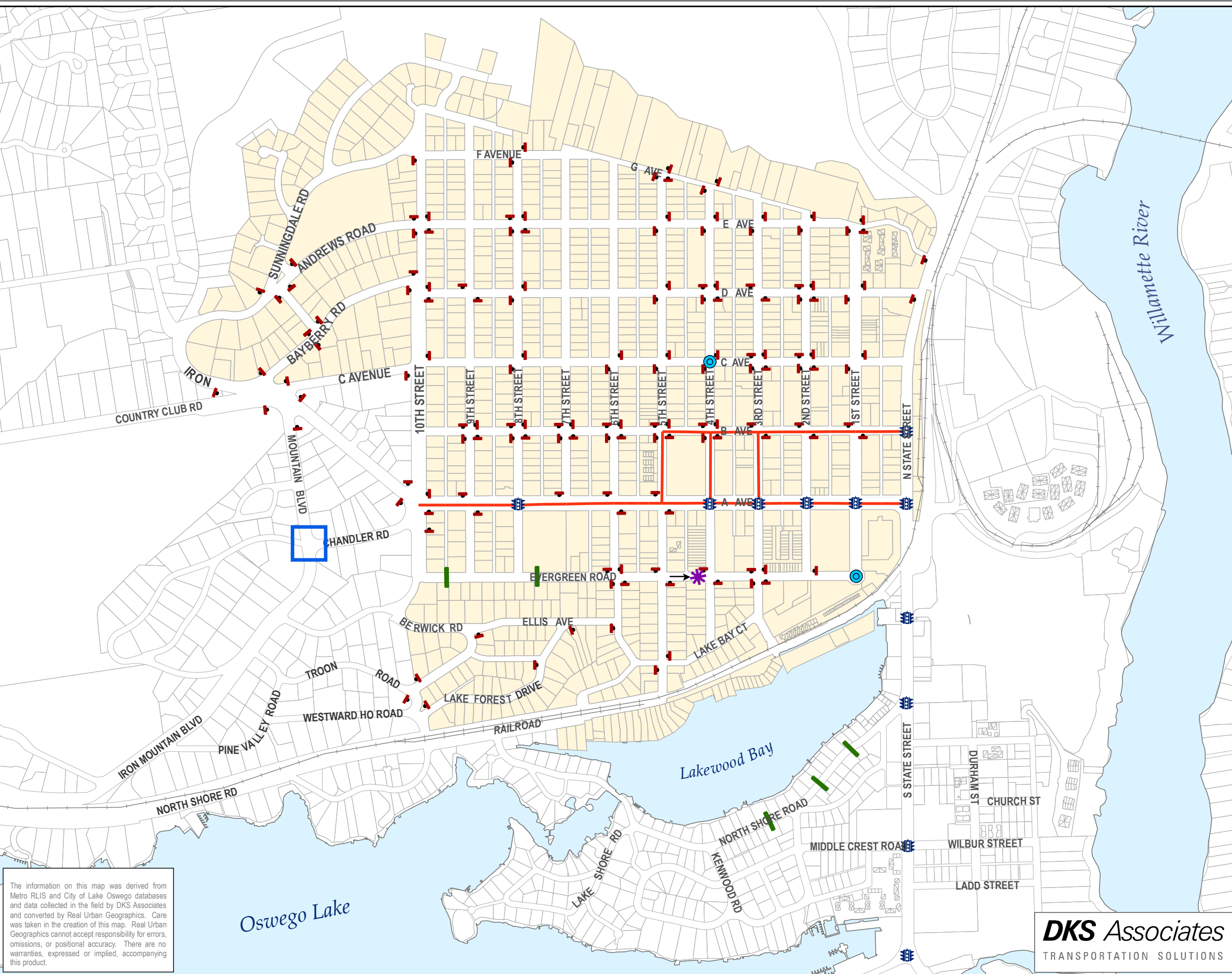
STUDY AREA

TAXLOTS

RAILROAD



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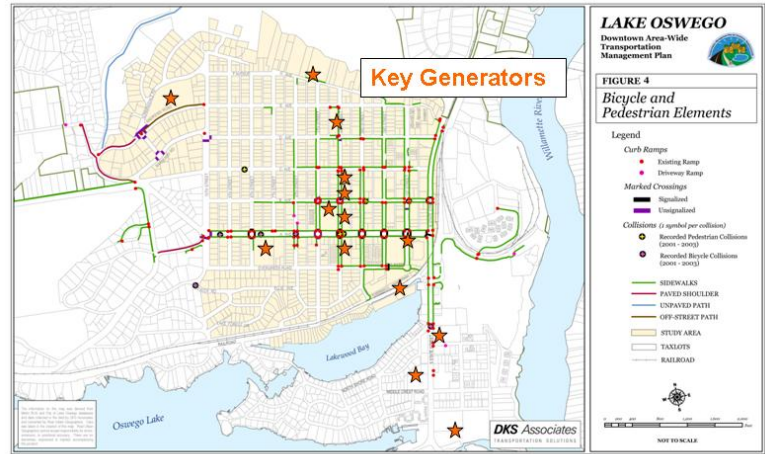
Pedestrian Facilities

Existing pedestrian facilities in the study area streets were inventoried and are shown in Figure 4-4. In general, sidewalks are provided consistently within the downtown commercial core area. West of 5th Street, pedestrian facilities are generally not provided. Curb ramps at intersections with sidewalks are generally provided within the study area; however, there are a few locations (2nd/B and 3rd/Evergreen) that do not provide curb ramps.

The City has an ADA program with annual funding that can address these locations.

Within the study area, there are two schools (Forest Hills Elementary and Our Lady of the Lake) that generate pedestrian traffic. Eleven other key pedestrian generators (shown in the graphic to the right) were also identified, including the Adult Community Center, the Library, the US Post Office, the transit center, City Hall, and commercial and recreational areas. Five routes were identified that most directly connect these major pedestrian generators and do not provide pedestrian facilities:

- 10th Street (Evergreen to E Avenue), connecting Evergreen, First Addition, churches, and Forest Hills Elementary School
- Evergreen (from 10th to 4th), connecting Evergreen to downtown
- 4th Street (from E to the Adult Community Center)
- E Avenue (from 5th to 10th), connecting Forest Hills Elementary School to the library
- Durham Road (from Ladd to Wilbur), connecting the Village Shopping Center to George Rogers Park



Key Pedestrian Generators

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Downtown Area-Wide Transportation Management Plan



FIGURE 4 - 4

Bicycle and Pedestrian Elements

Legend

Curb Ramps

- Existing Ramp
- Driveway Ramp

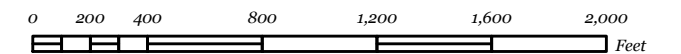
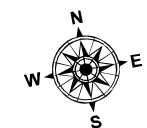
Marked Crossings

- Signalized
- Unsignalized

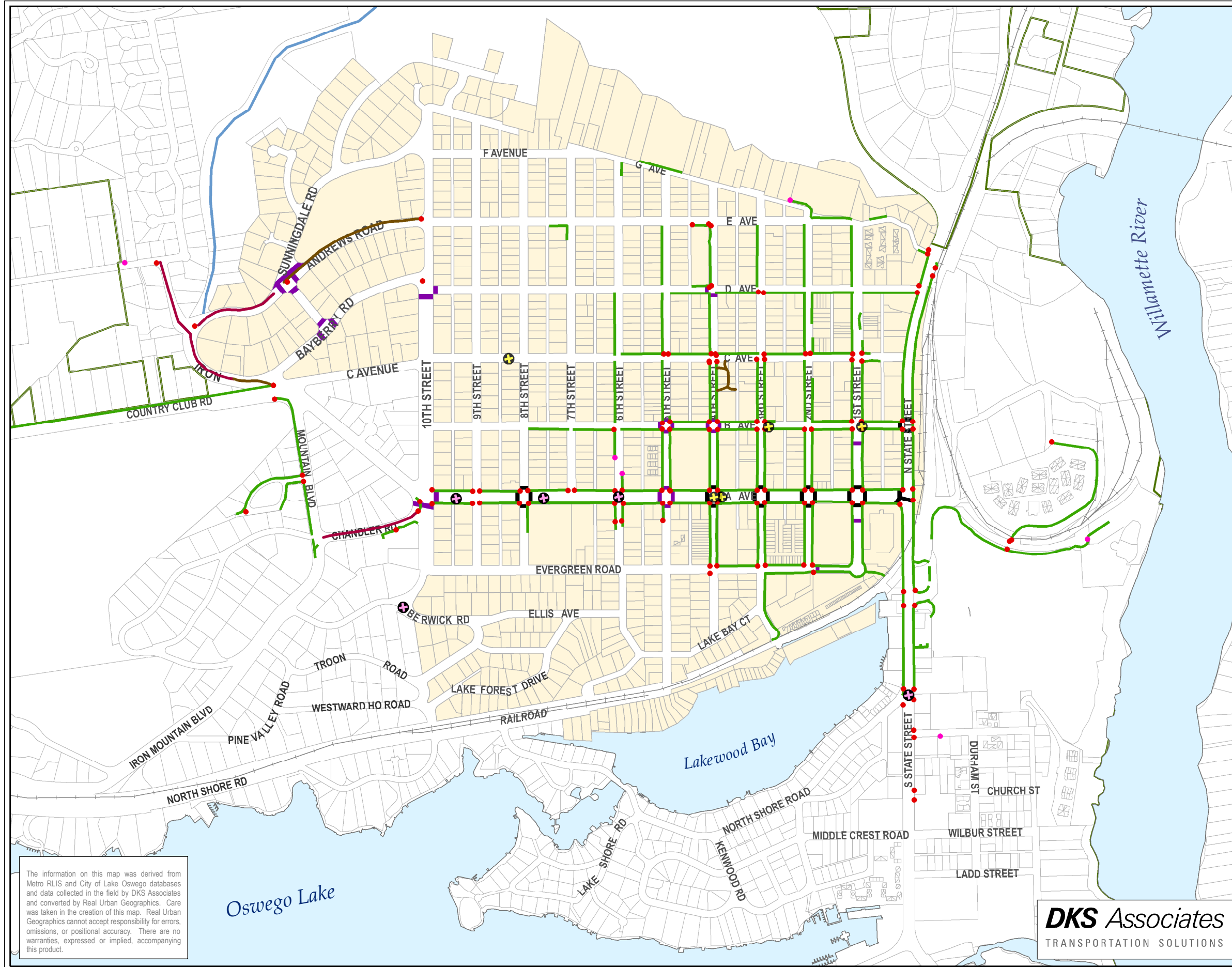
Collisions (1 symbol per collision)

- ⊕ Recorded Pedestrian Collisions (2001 - 2003)
- ⊕ Recorded Bicycle Collisions (2001 - 2003)

- SIDEWALKS
- PAVED SHOULDER
- UNPAVED PATH
- OFF-STREET PATH
- STUDY AREA
- TAXLOTS
- RAILROAD



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Pedestrian counts were conducted at several locations during spring 2005 (count data is available in the appendix). This data was used to guide identification of pedestrian needs and prioritization of pedestrian improvements developed as part of this plan. Pedestrian volumes range from less than 15 pedestrians per hour on residential streets not connected to major generators to more than 70 pedestrians per hour near Forest Hills Elementary School. Of the roadways serving Forest Hills Elementary, 10th Street and E Avenue carry the highest level of pedestrian volumes. Throughout the study area, the roadways carrying the highest levels of pedestrian traffic include:

- 10th Street north of C Avenue (up to 60 pedestrians per hour)
- E Avenue west of 5th Street (up to 70 pedestrians per hour)
- 4th Street south of B Avenue (up to 50 pedestrians per hour)

Collision data were also reviewed to identify locations that may have a history of pedestrian conflicts. Between the years 2001 and 2003, two pedestrian/motor vehicle crashes occurred on B Avenue, one at 1st and another at 3rd. During the same period, one pedestrian/motor vehicle crash was recorded on A Avenue at 4th Street.

Parking

A parking survey was conducted during the summer of 2005 to determine the number of available parking spaces in the downtown core and the weekday and weekend parking demand. Residents participated with City staff in providing numerous observations at peak times. The parking survey area covered the commercial core bounded by State Street to the east, 6th Street to the west, Lake Bay Court to the south, and D Avenue to the north.

Observations of the number of on-street and off-street (private and public) parked spaces were made. In addition, the survey group observed the parking demand (occupied spaces) during the week and on the weekend. Up to five observations were made at each location and the resulting data was averaged to compile a spatial data set representing the existing parking congestion in the survey area. Figures 4-5, 4-6, and 4-7 show the observed parking congestion during weekday mornings, weekday afternoons, and on the weekend, respectively. Table 4-1 lists the parking data compiled over the entire downtown survey area.



**On-Street Parking in
Downtown Lake Oswego**



Table 4-1: Existing Parking Occupancy (summer 2005)

| Type | Available Spaces | Weekday Morning | | Weekday Afternoon | | Weekend | |
|------------|------------------|-----------------|------------|-------------------|------------|-----------------|------------|
| | | Number Occupied | % Occupied | Number Occupied | % Occupied | Number Occupied | % Occupied |
| On-Street | 1,020 | 462 | 45% | 403 | 40% | 466 | 46% |
| Off-Street | 1,811 | 911 | 50% | 835 | 46% | 668 | 37% |
| Total | 2,831 | 1,373 | 48% | 1,239 | 44% | 1,134 | 40% |

Morning – 8:00 AM to 1:00 PM
 Afternoon – 1:30 PM to 9:00 PM
 Weekend – 11:00 AM to 4:00 PM

As a whole, there is adequate parking supply to serve existing demand. Overall, downtown occupancy of less than 50 percent indicates adequate available parking. However, there are focused areas that experience high levels of parking occupancy (e.g., surrounding downtown retail, near the Post Office, around the transit center). This is not unusual for many commercial districts in the region and nationwide. In general, a boundary of the highest levels of parking usage was found to be contained inside 4th Street, C Avenue, State Street, and the lake. This means that downtown parking generators are not generating parking demand that overflows into the surrounding neighborhood beyond these streets. Specific problem areas were found adjacent to the US Post Office and the Library, where patrons commonly utilized on-street parking within a block or two of these sites. Downtown parking activity was not found to impact residential areas outside those mentioned above.

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Management Plan



FIGURE 4 - 5

Parking Congestion Weekday A.M. Observations

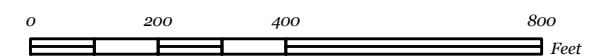
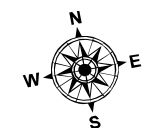
Legend

Observed Parking Congestion Value
= Occupied Spaces/Total Spaces

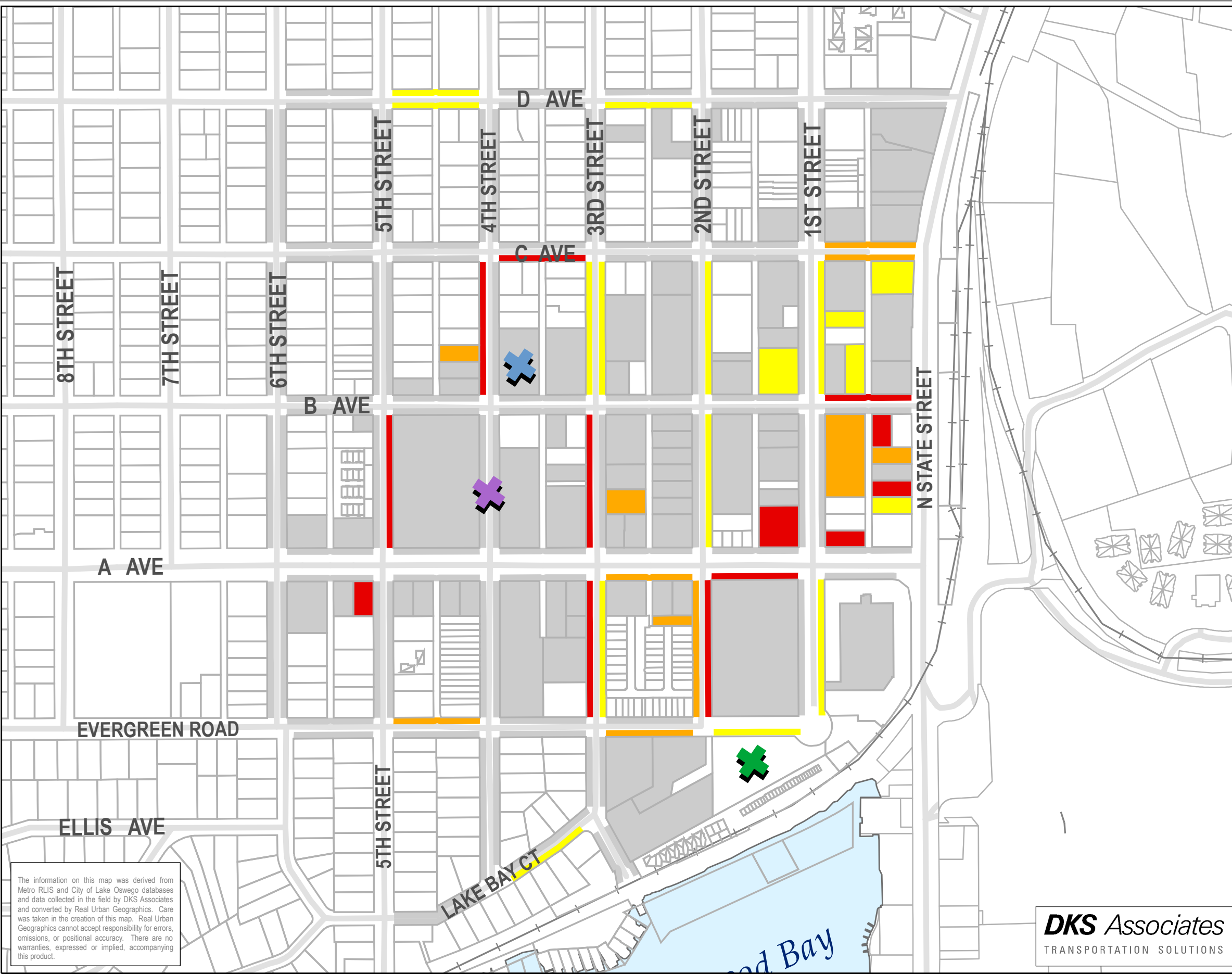
- < 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- > 0.9

- TAXLOTS
- RAILROAD

- POST OFFICE
- TRANSIT CENTER
- MILLENNIUM PARK



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FIGURE 4 - 6

Parking Congestion Weekday P.M. Observations

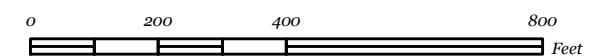
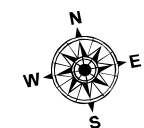
Legend

Observed Parking Congestion Value
= Occupied Spaces/Total Spaces

- < 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- > 0.9

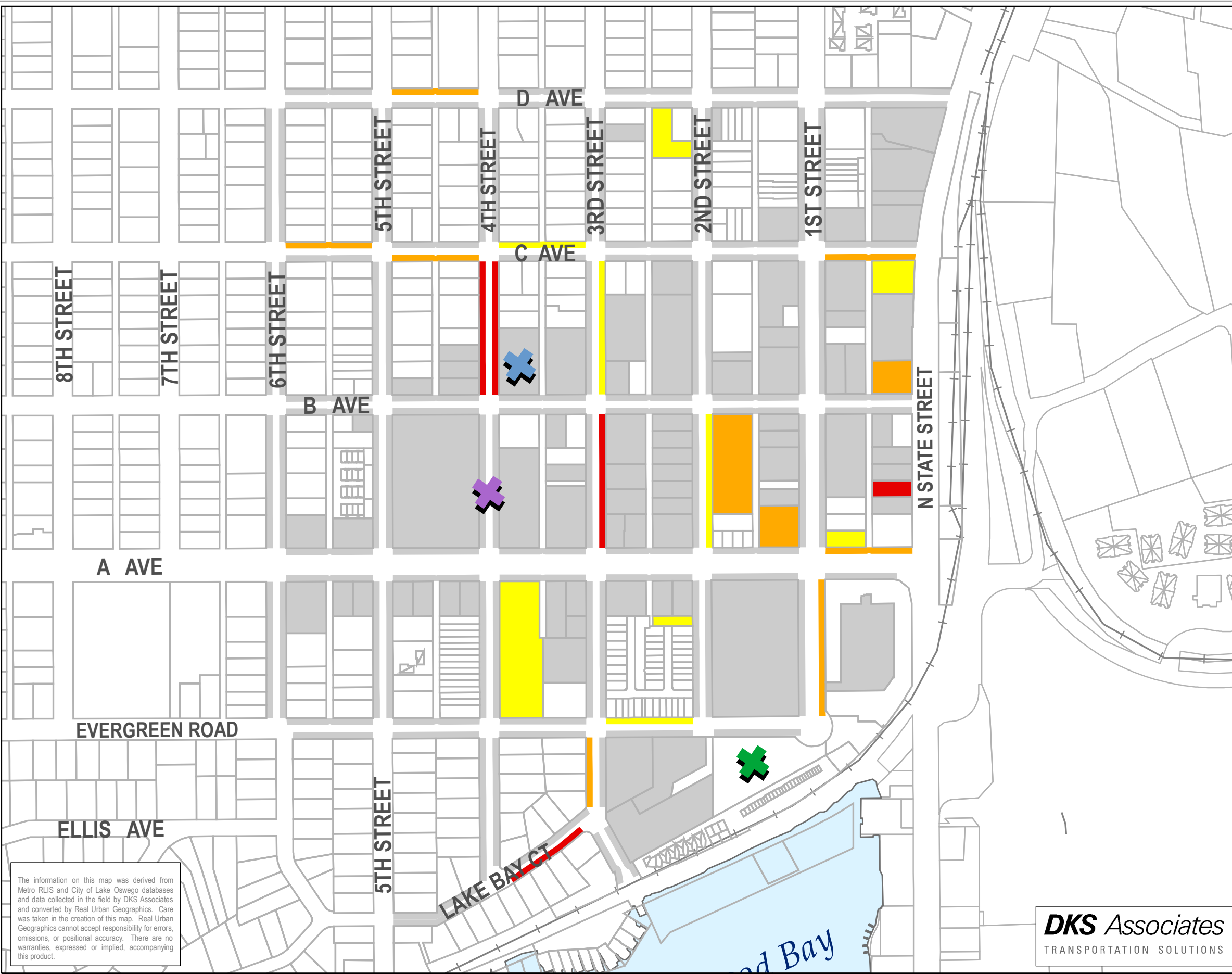
- TAXLOTS
- RAILROAD

- POST OFFICE
- TRANSIT CENTER
- MILLENNIUM PARK



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FIGURE 4 - 7

Parking Congestion Weekend Observations

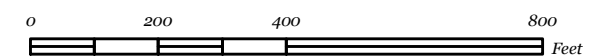
Legend

Observed Parking Congestion Value
= Occupied Spaces/Total Spaces

- < 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- > 0.9

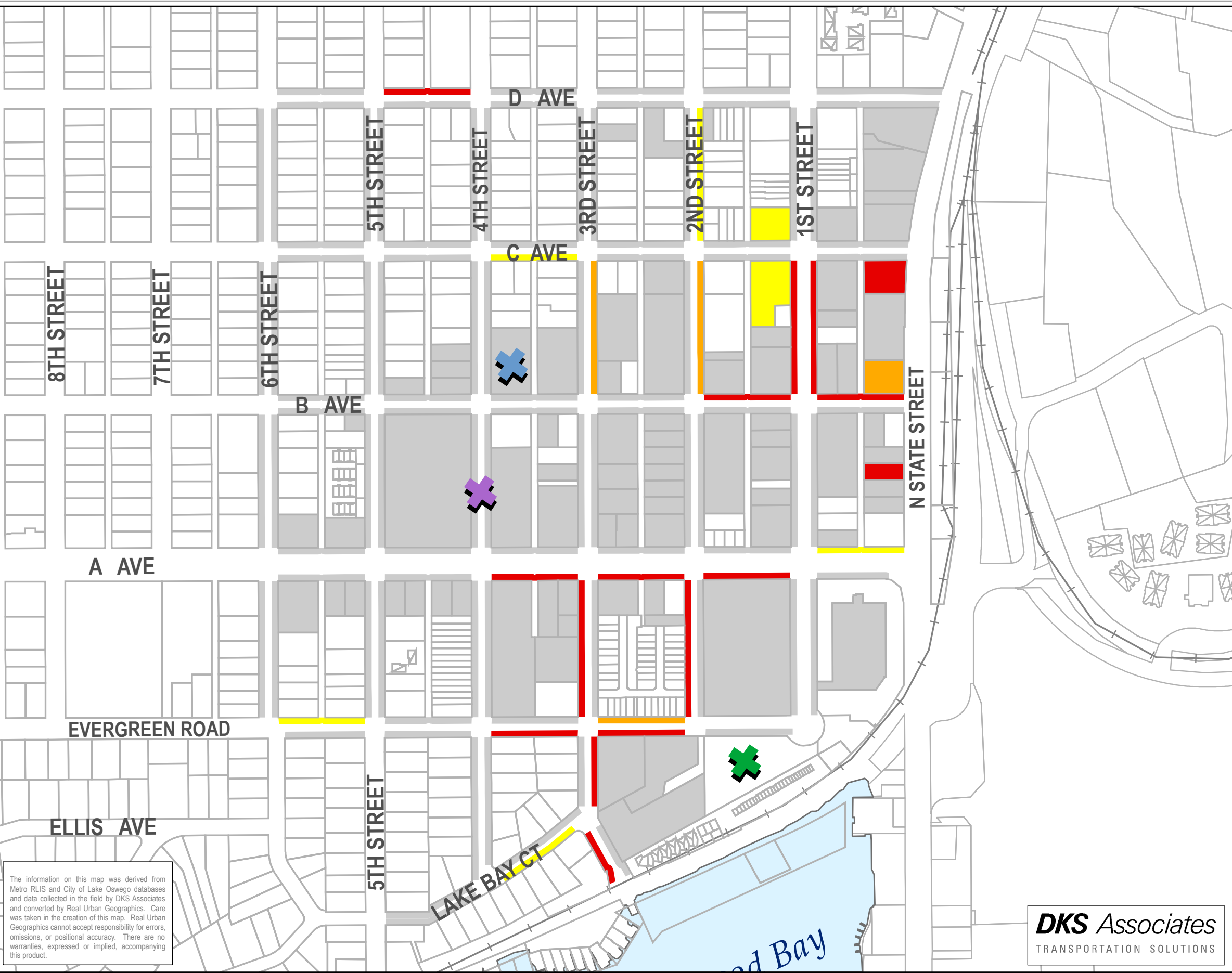
- TAXLOTS
- RAILROAD

- POST OFFICE
- TRANSIT CENTER
- MILLENNIUM PARK



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Future Conditions

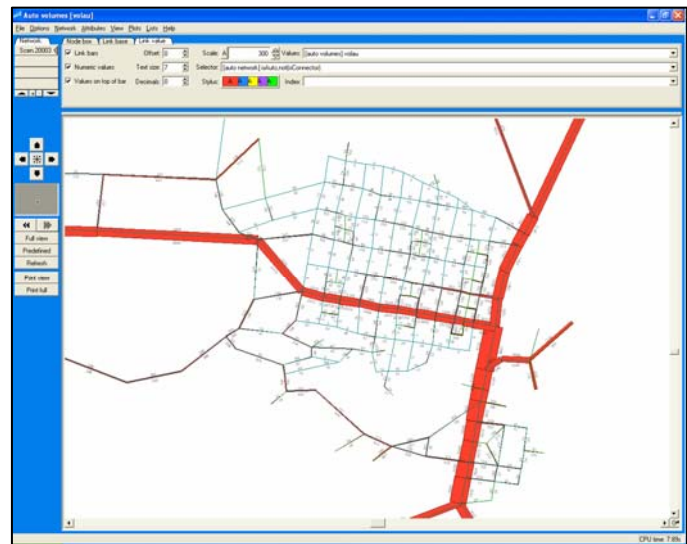
This section summarizes the future conditions that were evaluated in the downtown study area to determine the impacts of future growth in the downtown district on the surrounding neighborhoods. Future conditions were estimated for motor vehicle volumes and parking demand based on projected land use over the next 20 years. Detailed analysis can be found in the technical appendix (including land use tables).

Traffic Demand

A determination of future motor vehicle traffic volumes in downtown Lake Oswego requires the ability to accurately forecast travel demand resulting from estimates of future population and employment growth in the study area and the region. For this project, the Metro regional 2025 model used for the 2004 regional transportation plan (RTP) update was refined (detailed) and used to develop future forecasts for downtown Lake Oswego.

Table 4-2 lists the forecasted increase in demand on several roadways within the study area. As listed, the arterial roadways carrying local and regional traffic, are forecasted to grow by 40% over the next 20 years. Some of the local roadways are forecasted to grow at slower rates (e.g., growth on 4th Street north of B is 7% over 20 years), indicating fairly stable growth trends consistent with local development patterns. However, several local roadways are forecasted to grow significantly more than the arterial roadways (60% to 80% compared to 40%), which indicates a potential for increased cut-through on neighborhood streets to avoid arterials (e.g., North Shore, D Avenue, and E Avenue). This cut-through traffic increase is a result of an arterial system that cannot be improved (widened) to provide adequate through capacity in downtown Lake Oswego due to physical constraints.

It is important to note that the forecasted traffic demand does not always correspond to the realized growth in traffic volumes on roadways. For example, the peak congestion periods may spread to a larger part of the day. The forecasted demand provides insight into travel patterns and the potential for growth, while the actual volume increase in a congested network can vary.



Future Travel Demand Model Screen-Shot



Table 4-2: Lake Oswego Study Area Future Potential Daily Traffic Demand Summary

| Roadway | Existing Volume | Forecasted 2025 Volume | Increase | % Increase |
|-------------------------------------|------------------|------------------------|------------|------------|
| North Shore | 1,850 | 3,000 | 1,150 | 62% |
| East-West FAN streets (C, D, and E) | 300 to 900 | 500 to 1,600 | 200 to 700 | 75% |
| 4 th Street north of B | 2,100 | 2,250 | 150 | 7% |
| C Street west of 10 th | 1,470 | 2,500 | 1,000 | 70% |
| Durham | 600 | 1,100 | 500 | 83%* |
| Evergreen west of 5th | 450 | 600 | 150 | 33% |
| B Avenue east of 4 th | 7,000 | 12,000 | 5,000 | 71% |
| A Avenue | 19,000 to 25,000 | 28,000 to 34,000 | 9,000 | 40% |
| State Street north of A | 24,130 | 34,000 | 10,000 | 41% |

Note: Volumes data is for weekday daily volume

*The increase on Durham Road is attributed to redevelopment in the surrounding commercial area, not regional cut-through traffic.

The future traffic volume forecasts listed in Table 4-2 indicate that cut-through traffic on some local streets in the study area will increase over the next 20 years. To quantify this information, the forecast model was used to analyze the portion of the traffic on several study area streets that originated or terminated within the study area. The remaining portion of the forecasted volume (without a trip-end in the study area) was categorized as cut-through traffic. The results of the analysis indicate that cut-through traffic originating outside of the study area would increase in downtown Lake Oswego over the next 20 years. Of the growth occurring on local streets within the study area, less than one-third is estimated to be caused by growth within downtown Lake Oswego. The remaining traffic growth is due to growth in the rest of Lake Oswego and the surrounding areas. Downtown growth does not cause traffic levels on neighborhood streets to exceed 1,200 ADWT⁵. Unfortunately, much of the growth due to other sub-regional causes is outside the control of the City of Lake Oswego. Local streets that may be impacted by non-local cut-through traffic and could exceed local street standards include:

- North Shore Road (3,000 vehicles estimated per day)
- C Avenue (1,600 to 2,500 vehicles estimated per day)
- D Avenue (500 to 1,600 vehicles estimated per day)
- E Avenue (500 to 1,600 vehicles estimated per day)
- Durham Street (1,100 vehicles estimated per day)

⁵ ADWT = Average Daily Weekday Traffic



Given the growth in cut-through traffic, traffic calming measures to manage the traffic impact to local streets were further tested with the future (2025) forecast model. Traffic calming treatments on North Shore Road (which would lower travel speeds) were found to reduce but not eliminate cut-through traffic volumes. Traffic calming treatments on E, D, and C Avenues (which would lower travel speeds) were found to be effective in managing cut-through volume and could potentially hold future volumes near current levels, depending on the level of calming implemented. The installation of a series of all-way stops on B Avenue was found to reduce traffic on B Avenue, but because it is an important relief to A Avenue, would divert 1,500 to 2,000 vehicles per day onto other parallel roadways in First Addition (C, D, and E Avenues).

Parking Demand

To estimate the future parking demand in the study area, land use data developed for the traffic forecast model were utilized. Parking generation ratios based on the Institute of Transportation Engineers' (ITE) Parking Generation⁶ information report were applied to the increase in households, retail employees, and non-retail employees forecasted by the model. The estimated increase in parking demand varied from 520 vehicles during the weekend to 630 vehicles during weekday afternoons, which corresponds to approximately 50% growth in parking demand over the next 20 years.

This increased demand was compared to the potential supply of off-street parking required by the City Code, which was estimated based on forecasted land uses and listed in Table 4-3.

Based on the increase in households and employment, approximately 360 off-street parking spaces would be required with new development (based on minimum parking requirements).

This increase in supply is approximately 40% less than the increase in demand, suggesting that on-street parking occupancy could increase significantly over the next 20 years if current City Code is implemented, which would add to the number of parking issue locations (approximately a 50% increase in on-street parking issue areas). However, overall downtown area parking levels would still be maintained at approximately 60% occupancy during peak periods. In addition, developments may supply more than the minimum parking required, which would lessen the impact on on-street parking supply. As a worst case comparison, if new off-street parking was not supplied with new developments, the on-street parking throughout the survey area would be fully occupied during peak times, creating potential spill over into residential areas.

⁶ Parking Generation – 3rd Edition, Institute of Transportation Engineers, 2004.



Table 4-3: Future Growth in Off-Street Parking Supply (minimum code requirement)

| Land Use Type | Amount | Minimum Parking Supply Rate | Downtown Area Reduction Factor | Retail Use Reduction Factor | Fronting On-Street Parking Credit | New Parking Spaces Required |
|-----------------------|----------|-----------------------------|--------------------------------|-----------------------------|-----------------------------------|-----------------------------|
| Residential | 30 units | 1.50 | 0.75 | 1.00 | 15 | 12 |
| Retail Employment | 163 KSF | 3.33 | 0.75 | 0.90 | 168 | 215 |
| Non-Retail Employment | 68 KSF | 4.00 | 0.75 | 1.00 | 71 | 133 |
| Total | | | | | | 360 |

Note:

KSF is thousand square feet

Speed and Volume Threshold Evaluation

The City of Lake Oswego has adopted a neighborhood traffic management program⁷ that includes policies on the implementation of traffic calming projects. Included in these policies are volume and speed thresholds for residential streets that are used to determine if a traffic calming project will significantly impact another local street. These thresholds include:

- Diversion from a traffic calming project shall not increase volume on another local street with an average weekday volume (ADWT) less than 400 vehicles by more than 50% or 100 vehicles, whichever is less.
- Diversion from a traffic calming project shall not increase volume on another local street with an ADWT above 400 vehicles by more than 25%.
- Diversion from a traffic calming project shall not increase the ADWT on another local street to higher than 1,200 vehicles.
- Local street speeds should not exceed 28 miles per hour (85th percentile speed⁸).

The volume thresholds of 1,200 ADWT and 85th percentile speed of 28 mph, which were used to evaluate the issues in this project's study area, are within the same range or slightly lower than other traffic calming programs in the Portland/Vancouver Metropolitan area (e.g. Vancouver and Camas), as well as national traffic calming guidelines⁹. Volume thresholds for local streets commonly range from 1,500 vehicles per day to 2,000 vehicles per day. A common speed threshold is an 85th percentile speed of 30 mph. Therefore, the City of Lake

⁷ City of Lake Oswego Code Section 32.14.032, viewed on the City's website (www.ci.oswego.or.us) on August 16, 2005.

⁸ 85th percentile speeds are determined by using roadway-tube counters that track vehicles speeds over a 24-hour period. The 85th percentile speed is the speed that 85% of the vehicles travel at or below.

⁹ *Transportation Planning Handbook – Chapter 17*, Institute of Transportation Engineers, Washington D.C., 1999.



Oswego speed and volume thresholds are at a reasonable and prudent level that should be maintained in future livability considerations.

Issue Findings Summary

The analysis presented in the previous sections measured the impact of existing and future issues at multiple locations within the study area, some that can be attributed to growth in the downtown core area and others that cannot. Table 4-4 lists a summary of those issues that were found to impact neighborhoods surrounding the downtown district.

Overall, the results of the issue analysis conclude that although growth in downtown Lake Oswego will have some impact on surrounding neighborhoods, it will likely be exceeded by growth occurring outside the downtown area or even outside Lake Oswego. Traffic volume growth will occur on residential streets, although cut-through traffic attributed to regional growth (outside of downtown Lake Oswego) is the most significant factor in problematic areas (locations exceeding 1,200 ADWT). Pedestrian facilities are generally provided in the downtown core and current neighborhood plans identify additional pathways that would enhance connections to residential areas. As growth in traffic occurs over time, the need for safe pedestrian paths will increase. City policies for off-street parking should maintain the current balance between parking supply and demand. Therefore, the following strategies should manage the impacts of growth in the downtown area:

- Monitor traffic volumes on surrounding residential streets to determine if volume or speed thresholds are exceeded. If thresholds are exceeded, work with the neighbors to construct improvement measures that mitigate development impacts.
- Provide the code required amount of off-street parking either through on-site provisions and/or centralized public parking.
- Provide pedestrian system enhancements (curb extensions, ADA ramps, etc.) on site and along site frontage as development occurs to support the existing and planned pedestrian facility network in the downtown area.

Several of these issues are addressed within neighborhood plans completed in the First Addition and Evergreen neighborhoods. However, with the available data and technical analysis provided by this project, these issues were carried forward to alternatives analysis to provide additional guidance for neighborhoods within the study area.



Table 4-4: Neighborhood Transportation Issues Findings Summary

| Issue | Location | | |
|-------------------------------|--|--------------------|------------------|
| | | Existing Condition | Future Condition |
| <i>Traffic Calming</i> | | | |
| Volume | North Shore | ■ | ■ |
| | 4 th Street | ■ | ■ |
| | C Avenue west of 10 th | ■ | ■ |
| | Bayberry | ■ | ■ |
| | C Avenue east of 10 th | | ■ |
| | D Avenue | | ■ |
| | E Avenue | | ■ |
| | Durham | | ■ |
| Speed | North Shore | ■ | ■ |
| | Westward Ho | ■ | ■ |
| | C Avenue west of 10 th | ■ | ■ |
| Stop Sign Compliance | Evergreen Neighborhood | ■ | ■ |
| Vehicle Crashes | First Addition Neighborhood | ■ | ■ |
| <i>Walking</i> | | | |
| Safe Routes to School | First Addition Neighborhood | ■ | ■ |
| Connections to Key Generators | Evergreen and First Addition Neighborhoods | ■ | ■ |
| Crossing Safety | A Avenue and B Avenue | ■ | ■ |
| <i>Parking</i> | | | |
| Overflow into Neighborhoods | Transit Center | ■ | ■ |
| | Millennium Park | ■ | ■ |
| | US Post Office | ■ | ■ |
| | Library | ■ | ■ |

5. Developing Alternatives

Toolbox Development

In October 2005, an open house was held to present issue analysis findings to citizens and to engage them in the identification of alternative solutions. The first task of the meeting was to select preferred tools for calming traffic and pathway construction, considering the expressed desire to maintain the character of the residential streets. The following sections discuss the tools identified by citizens as appropriate to address issues within the study area. These tools were then applied to study area roadways to create improvement alternatives based on citizen input to address the neighborhood issues. Chapters 6, 7, and 8 discuss these improvement alternatives.

Traffic Calming Tools

A wide variety of traffic calming tools are available to address speeding and cut-through issues on residential streets. The City has a traffic calming program that has been successful in implementing several traffic calming measures within the study area (e.g. Evergreen diverter, 4th/C traffic circle, North Shore speed bumps, Iron Mountain/10th channelization). The expected performance of several options is listed in Table 5-1. The most effective tools to slow traffic include speed humps, speed trailers/driver feedback signs, traffic circles, and street narrowing.



Speed Bump on Evergreen

The most effective tools to reduce cut-through volume include diverters, chokers, speed humps, and traffic circles.

Service providers were questioned during key stakeholder interviews (e.g. the garbage hauling company and the City of Lake Oswego Fire Department) about the impact of traffic calming measures on their operation. They expressed concerns with traffic circles impacting truck service routes, particularly the existing 4th Street/C Avenue traffic circle. For future traffic calming projects, they desire solutions to be designed with mobility in mind for trucks and school buses, including the following considerations:

- Traffic circles need to be large enough to navigate
- Curb extensions need to have large enough turning radii
- Speed bumps need to have a low enough profile to not significantly impact trucks

Table 5-1: Traffic Calming Device Performance

| Measures | No. of Studies | Speed Reduction (MPH) | | | Volume Change (ADT) | | | Public Satisfaction |
|-----------------------|----------------|-----------------------|------|---------|---------------------|------|---------|---------------------|
| | | Low | High | Average | Low | High | Average | |
| Speed Humps | 262 | 1.0 | 11.3 | 7.3 | 0 | 2922 | 328 | 79% |
| Speed Trailer | 63 | 1.8 | 5.5 | 4.2 | 0 | 0 | 0 | 90% |
| Diverters | 39 | - | - | 0.4 | 85 | 3000 | 1102 | 72% |
| Circles | 26 | 2.2 | 15 | 5.7 | 50 | 2000 | 280 | 72% |
| Enforcement | 16 | 0.0 | 2.0 | 2.0 | 0 | 0 | 0 | 71% |
| Traffic Watch | 85 | 0.5 | 8.5 | 3.3 | 0 | 0 | 0 | 98% |
| Chokers | 32 | 2.2 | 4.6 | 3.3 | 45 | 4100 | 597 | 79% |
| Narrow Streets | 4 | 5.0 | 7.0 | 4.5 | 0 | 0 | 0 | 83% |

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

A variety of tools were presented to citizens at the October 2005 open house. Based on the desired traffic calming outcomes and street design characteristics, the following traffic calming tools were selected as the preferred devices for the study area:

- Treatments to establish the neighborhood boundary, narrow intersections and discourage cut-through (including curb extensions, traffic circles, and landscaping)
- Traffic flow modifications with diverters or one-way streets
- Stop sign strategies
- Intersection alignment correction/channelization to remove skews (non-perpendicular angles)
- Roadway narrowing

Additional information on traffic calming tools can be found on the City of Portland’s transportation office website – www.portlandonline.com/transportation/ (under Transportation Services, Safety, Reducing Driver Error, Traffic Calming/Speed Bumps).



Pathway Tools

The October 2005 open house included a design task to create preferred design options for pathway construction in the neighborhoods. Working with the consulting design team, the following features were identified as desirable characteristics of pathways in the study area:

- Provide pathways continuously on one-side of a walking corridor to avoid crossing back and forth
- Provide a green-space separation between the motor vehicle travel way and the pathway
- Provide on-street parking adjacent to the motor vehicle travel way as a buffer (rather than street-tight pathways)
- Construct pathways of rigid material (asphalt or Portland-cement)
- Do not construct pathways with curbed separation (retain “country lane feel”)
- Minimize impacts to existing driveways



Potential Pathway Design
Source: Otak

In addition to the pathway design preferences noted above, the Citizen Advisory Team noted support of the recently constructed crushed-granite pathway at Cabana Lane/North Shore.

Parking Tools

Citizens at the October 2005 open house identified one parking improvement tool for consideration in the plan. To enhance the pedestrian environment and aesthetic character of downtown, a consolidated public parking facility (in-lieu of individual private parking) was recommended.



6. Traffic Calming Plan

Introduction

The citizens in the area surrounding downtown Lake Oswego have voiced concerns about the impacts of potential future growth in downtown on their neighborhoods. In particular, they are concerned with cut-through traffic, which many fear will increase with growth from new developments. These issues were analyzed in Chapter 4. Although cut-through was found within these neighborhoods, growth in the downtown area was not found to be the major contributing factor.

This chapter presents a traffic calming plan that focuses on issues of motor vehicle volume and speed on local streets, safety at intersections, and congestion on the roadway system. Neighbors were asked to apply selected tools to the roadways in their neighborhood (with guidance from the project team) to address specific traffic issues. These improvement alternatives were then analyzed and are presented in the following pages. The preferred alternatives create a Traffic Calming Action Plan.

Managing Vehicle Volumes and Cut-Through

Cut-through traffic and total vehicle volume were two major concerns in several of the neighborhoods surrounding downtown Lake Oswego. The following sections describe and evaluate the alternatives identified to address these issues (grouped by geographic area).

Lakewood, Evergreen, and County Club-North Shore Neighborhoods

Citizen Identified Alternatives

Cut-through traffic that exceeds local street standards was verified as an existing and future issue on North Shore Road between State Street and Berwick (in both directions). Where North Shore Road crosses the lake into the Evergreen and Country Club-North Shore neighborhoods, traffic spreads to several routes to reach County Club Road and Iron Mountain (Berwick, Westward Ho, Pine Valley), none of which exceed volume level thresholds on their own. To address this issue, two citizen alternatives were identified:

1. **Entry Treatments** at entry points onto North Shore Road may discourage cut-through traffic. These gateways locations would serve to create a “curtain” effect along the perimeter of routes feeding North Shore. Specifically, gateways consisting of curb extensions or medians to narrow intersections (with landscaped emphasis) were identified at:
 - i. Iron Mountain Road/Chandler Road
 - ii. Iron Mountain Road/Berwick Road



- iii. Iron Mountain Road/Troon Road
- iv. Iron Mountain Road/Pine Valley Road
- v. Berwick Road/Ellis Avenue
- vi. Berwick Road/Lake Forest Drive
- vii. North Shore Road/State Street

2. **Traffic Circle** installations along North Shore and Berwick were also identified as cut-through treatments. Participants identified the following locations as two intersections that would be desirable locations for traffic circles:

- i. 10th Street/Berwick Road

Alternative Evaluation

Both of these alternatives have been effective in reducing traffic volumes by adding incremental delay to vehicle trips. Improvements on North Shore Road would be a likely first step because this roadway appears to meet City traffic calming program eligibility. Treatments to the west (Iron Mountain, Berwick) are not eligible for traffic calming program funding under existing conditions (although they could be eligible in the future). In addition, treatments to the west would require a substantial capital investment across multiple routes to create an effective “curtain” treatment at the entry points into the neighborhood. To implement a “curtain” at the western edge of the neighborhood, treatments would be most effective along Iron Mountain Road (at Chandler, Berwick, Troon, and Pine Valley) to discourage drivers from cutting-through before they are within the neighborhood (as opposed to treatments on Berwick at Lake Forest and Lake Shore where drivers would already be traveling within the neighborhood and would be less likely to alter route choice based on entry treatments). With both the entry treatment and traffic circle alternatives, design considerations should be given to service vehicles (e.g. school buses and garbage trucks) to maintain mobility.

Recommendation

Based on this evaluation, the following projects are recommended:

- Short Term: Construct an entry treatment on North Shore at State Street to narrow the intersection.
- Long Term: Construct a traffic circle at Berwick/10th and construct curb extensions to narrow the intersections of Iron Mountain/Chandler, Iron Mountain/Berwick, Iron Mountain/Troon, and Iron Mountain/Pine Valley.

These may need to be monitored and tested to see if they produce the desired impact (before/after study).



First Addition Neighborhood

Citizen Identified Alternatives

Cut-through traffic and higher than average overall volume were verified as issues on C Avenue west of 10th Street, Bayberry west of 10th Street, and 4th Street north of B Avenue. In the future, cut-through traffic growth and potential road extensions could trigger volume thresholds on C Avenue, D Avenue, and E Avenue between State Street and 10th Street.

When neighbors were asked to identify preferred treatments and locations, the following list was created:

1. **Entry Treatments** at entry points into First Addition. Specific locations included:
 - i. C Avenue near the County Club intersection
 - ii. Bayberry near the County Club intersection
 - iii. E Avenue between 1st and 2nd
 - iv. D Avenue between 1st and 2nd
 - v. 4th Street between C and D (in addition to the existing traffic circle).
2. **Traffic Circle** installations as cut-through treatments for both east-west and north-south traffic patterns. Specific locations included:
 - i. 10th Street/C Avenue
 - ii. 4th Street/D Avenue
 - iii. 5th Street/B Avenue
3. **All-Way Stops** installations to increase vehicle delay and reduce cut-through traffic. Specific locations included:
 - i. 1st Street/D Avenue
 - ii. 4th Street/D Avenue
 - iii. 5th Street/C Avenue
 - iv. 10th Street/C Avenue
4. **Diverters** that block east-west traffic and reroutes traffic towards A Avenue and B Avenue were chosen to address potential impacts if D Avenue was extended across State Street. Diverters would be located on:
 - i. D Avenue between 1st and 2nd
 - ii. C Avenue between 1st and 2nd



5. **One-Way Traffic Flow** was identified for 4th Street between D and E. This flow would be northbound only, which is currently implemented on general election days to facilitate ballot drop-off at the library.

Alternative Evaluation

Entry treatments, traffic circles, diverters, and one-way traffic flow are appropriate tools for managing traffic volumes. All-way stops are not warranted at the suggested locations and would not be recommended because the installation of un-warranted all-way stop installations can create potential conflicts between vehicles or between vehicles and pedestrians due to a lack of driver stopping compliance. Conversion to one-way traffic flow on 4th Street would be effective at reducing volumes on 4th to local street standards; however, this improvement would likely exceed traffic calming standards by diverting more than 400 trips onto 5th or 3rd Street each weekday.

For existing issues, providing treatments at the perimeter of the study area would be the most effective way to discourage cut-through traffic (e.g. entry treatments west of 10th). Traffic circles in the center of the neighborhood would not be as effective because vehicles would already be well within the neighborhood before they encountered the device. However, a traffic circle at 5th Street/B Avenue could provide an effective entry treatment between the commercial downtown area and the residential area in First Addition (a traffic circle at this location would only be feasible if the transit center were to relocate in the future). Traffic volumes on 4th Street are the result of surrounding land uses (as opposed to cut-through traffic) and would not be significantly improved with additional entry improvements. C Avenue west of 10th Street is the only roadway meets City traffic calming program eligibility and therefore, should be the highest priority location.

In the long term, entry treatments on Bayberry Road near County Club and on E Avenue and D Avenue between 1st and 2nd would further discourage cut-through traffic between State Street and Country Club. If D Avenue was extended across State Street, diverters would be an effective measure to protect the neighborhood from additional cut-through. Diverters at these locations could be designed to allow emergency vehicle access.

Recommendation

Based on this review of the citizen identified improvement alternatives, the following improvements are recommended:

- Short term: Construct an entry treatment on C Avenue at County Club Road. This could include curb extensions, neighborhood signing, and landscaping enhancements.
- Long term: Construct entry treatments on D Avenue and E Avenue between 1st and 2nd consisting of curb extensions, neighborhood signing, and landscaping enhancements. Construct entry treatments on Bayberry near County Club, which could include realignment of the intersection with Country Club, neighborhood signing, and landscaping enhancements. Construct a traffic circle at 5th Street/B

Avenue if the transit center is relocated. If D Avenue is extended across State Street, construct diverters on D Avenue and E Avenue at 1st Street to restrict east-west flow.

These may need to be monitored and tested to see if they produce the desired impact (before/after study).

Old Town Neighborhood

Citizen Identified Alternatives

Overall motor vehicle volume was verified as potential future issue on Durham Street between Leonard and Ladd. Durham runs along the backside of retail development on State Street, providing an alternate access to the traffic signal at State/Wilbur. As congestion increases on State Street in the future, the amount of traffic using Durham could increase to local street thresholds. To address this issue, the following citizen alternative was identified:

1. **Traffic Circle** construction at Durham/Wilbur.
2. **Access Restriction** at the Village Shopping Center.

Alternative Evaluation

A traffic circle at Durham/Wilbur would not add a significant amount of delay to vehicles traveling south on Durham that turn right at Wilbur to reach State Street; therefore, it would not significantly improve motor volume issues on Durham. A more effective measure would be installing a diverter on Durham near Church, which would eliminate the north-south traffic flow. This diverter could be designed to maintain emergency vehicle access. However, a diverter would have significant impact to neighborhood circulation and is not the primary alternative for the neighborhood. The preferred option (based on neighborhood feedback) would be to place access restrictions on redevelopment of the Village Shopping Center, so that access would be restricted to northbound movements only at the site connection to Durham.



**Diverter in Berkely, CA Allowing
Emergency Vehicle Access**

Recommendation

Based on this review of the identified improvement alternative, the following improvement is recommended:

- Long term: If the Village Shopping Center redevelops in the future, implement access restricts to southbound traffic onto Durham.



Managing Speeding

Motor vehicle speeds exceeding desirable local street levels were found on roadways in the First Addition and Evergreen neighborhoods. The following sections describe and evaluate the alternatives created to address these issues (grouped by geographic area).

Speeding Enforcement

Citizen Identified Alternatives

Citizens identified the need for increased police enforcement of speed limits on local streets in the study area.

Alternative Evaluation

Police enforcement can be a cost-effective tool to manage driver behavior over a large area. To most effectively utilize limited City police resources, speed enforcement should be increased at locations where motor vehicle speeds above local street standard levels were identified.

Recommendation

Based on this review of the improvement alternatives and review of the speed surveys conducted for this project, the following locations have been forwarded to City of Lake Oswego Police for increased enforcement:

- C Avenue west of 10th Street (Weekdays, 7:00-9:00 AM and 4:00-6:00 PM)
- Westward Ho (Weekdays, 5:00-7:00 PM)
- North Shore (Weekdays, 12:00-2:00 PM)

First Addition Neighborhood

Citizen Identified Alternatives

West of 10th Street, C Avenue was found to exceed speeding thresholds for local streets. To address this issue, the following citizen alternatives were created:

2. **Roadway narrowing** between Country Club and 10th Street.
3. **Speed Bump** installation.

Alternative Evaluation

Roadway narrowing and speed bumps are effective tools for managing speeds on a residential street. Roadway narrowing would require a substantial capital project that would include landscaping and drainage adjustments along the entire length of the roadway. Speed bumps could be effective and offer a lower cost alternative. In addition, a driver speed feedback sign could be an effective and lower-cost measure to manage vehicle speeds. However, neighbors in the First Addition and Evergreen neighborhoods voiced a lack of



support for this tool as a primary solution. C Avenue, in this location, would likely meet City traffic calming program eligibility.

Recommendation

Based on this review of the improvement alternatives, the following short-term improvement is recommended:

- Short term: Install speed bumps on C Avenue between Country Club and 10th Street.

Country Club-North Shore Neighborhood

Evaluation

Westward Ho between Pine Valley and Berwick was found to exceed speeding thresholds for local streets. Citizens did not identify specific improvements to address speeding at this location, but they did not desire driver feedback signs. Speed bumps would be an effective tool at this location. However, this roadway does not currently meet City traffic calming program thresholds.

Recommendation

Based on this evaluation, the following long-term improvement is recommended:

- Long term: If speeding worsens, install speed bumps on Westward Ho between Pine Valley and Berwick.

Lakewood Neighborhood

Evaluation

North Shore Road near Kenwood was found to be near speeding thresholds for local streets. This location already has been improved with speed bumps near State Street. While citizens did not identify specific improvements to address speeding at this location, they did request that no more speed bumps be installed. In addition, citizens did not support the installation of driver feedback signs at this location. This location currently meets City traffic calming program thresholds under existing conditions.

Recommendation

Based on this evaluation, increased enforcement is the only recommended action.



Improving Driver Behavior

Evaluation

Drivers were found not obeying stop signs in the Evergreen neighborhood at Ellis/Berwick and Ellis/Lake Forest. At these 2-way stop controlled locations, the intersection is not perpendicular, the corner radius is large, and sight distance is ample, which leads to drivers rolling through the stop signs. To address this issue, citizens suggested narrowing and squaring the intersection with curb extensions. This could be implemented temporarily with striping (potentially using a durable wide stop line) and reflectors to test the improvement effectiveness.

Recommendation

Based on this evaluation, the following improvements are recommended:

- **Short Term:** Install striping and reflectors to re-align and narrow the intersections of Ellis/Berwick and Ellis/Lake Forest.
- **Long Term:** Construct curb extensions to permanently re-align and narrow the intersections at Ellis/Berwick and Ellis/Lake Forest, using standard curb radii to meet service vehicle needs.

Improving Intersection Safety

Citizen Identified Alternatives

Citizens in First Addition raised concerns with the irregular placement of stop signs and overgrown vegetation. This issue was verified with collision data at 6th/D, 6th/E, and 7th/C. To address this issue, the following citizen alternatives were created:

1. **Systematic Stop Sign** installation that would create an alternating 2-way grid system of stop signs.
2. **All-Way Stop** installations at 6th/D, 6th/E, and 7th/C, which do not have any stop signs today.
3. **Trim Vegetation** at overgrown corners that limit driver sight distance.

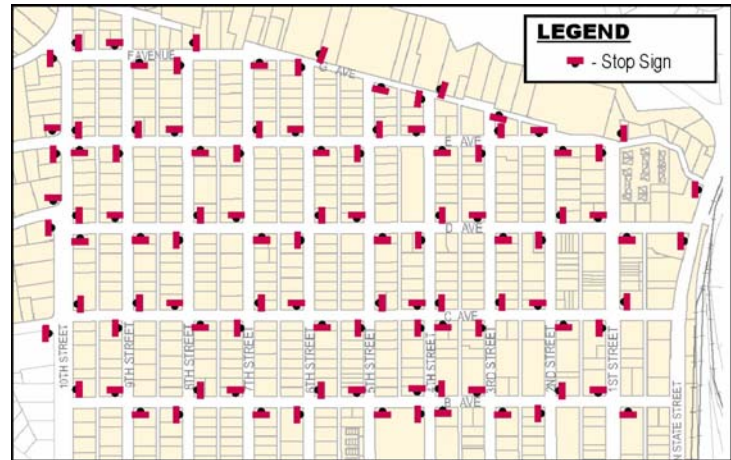
Alternative Evaluation

Systematic 2-way stops and vegetation trimming are valid improvement measures to address safety at these local street intersections. Alternating two-way stop intersections have been utilized in many cities to address this issue and provide uniformity. However, trimming and maintaining vegetation is the responsibility of property owners and should be addressed through coordination with owners or the neighborhood association.



All-way stops would not be warranted at these locations due to the low motor vehicle volumes. All-way stops are not warranted at the suggested locations and would not be recommended because the installation of un-warranted all-way stop installations can create potential conflicts between vehicles or between vehicles and pedestrians due to a lack of driver stopping compliance.

The alternating stop sign strategy would improve safety by standardizing the traffic control pattern and eliminating unwarranted all-way stops. The initial implementation of this alternative could include an area bounded by B Avenue, 10th Street, 5th Street, and F Avenue, where collision data indicates the need for potential mitigation. If this change is successful, the scheme could be applied to a larger area within the neighborhood.



Proposed Stop Sign Strategy

Recommendation

Based on this analysis, the following improvements are recommended:

- **Short Term:** Implement alternating two-way stops between B, F, 5th, and 10th. Coordinate with property owners to trim vegetation, as necessary, at intersections with sight distance restrictions during the stop sign installation.
- **Long Term:** If desirable based upon evaluation of the short term strategy, expand the alternating two-way stop sign pattern eastward (to 1st Street).



Managing Arterial Congestion

Evaluation

Congestion on arterial roadways in downtown Lake Oswego was verified as a source of cut-through traffic on neighborhood streets. Citizens are concerned that the study area arterials cannot serve the forecasted growth in regional traffic. In addition, citizens are interested in improved traffic controls at the intersections of A/10th and County Club/Iron Mountain to manage traffic flows. However, improvements for the arterial system to serve additional peak hour traffic are complex and require additional research and consideration. There are multiple issues involved with this corridor that require examination, including:

- a. Changes to any section of the roadway would impact operations at other intersections. A comprehensive examination is required to accurately anticipate the impacts of roadway improvements.
- b. Anticipated population and employment growth in Lake Oswego and nearby communities (e.g. West Linn, Tualatin, and Portland) will increase travel demand on this corridor over time. Improvements made today may become obsolete within a short period. Consideration should be given to the long term impacts of who the users of the additional capacity may be.
- c. Congestion on the corridor is a direct cause of cut-through traffic on 10th, Berwick, and North Shore Boulevard. These neighborhood streets and the arterial roadway system must be considered as a system when analyzing roadway improvement or management options.
- d. Street widening to provide additional capacity to serve growing sub-regional traffic would require acquisition of additional right-of-way, impacting private property owners or reducing space available for pedestrians, bicyclists, or parking.
- e. Regional and local transportation demand management strategies (e.g. carpool incentives, park and rides, transit service) could be utilized to reduce single-occupant vehicle (SOV) trips.

The complexity of this corridor necessitates additional study beyond the scope of the current plan. A focused study is suggested to address these issues. The City's 2004-2009 Capital Improvement Plan includes a study of the Country Club/C/Iron Mountain intersection to determine a preferred alternative (currently unfunded)¹.

¹ City of Lake Oswego Capital Improvement Plan 2004-2009, adopted March 15, 2005.



Recommended Traffic Calming Action Plan

Based on the results of the alternatives analysis and the recommended project priorities, short term and long term action plans were created and are listed in Tables 6-1 and 6-2. Actions recommended for the short-term address issues that were verified under existing conditions. Long-term recommended actions address potential future issues. Figure 6-1 shows the locations of these potential projects. Project cost estimates are listed in Chapter 9.

The implementation of the traffic calming projects will generally focus on community participation in the City of Lake Oswego Neighborhood Traffic Management Program (NTMP). The process for this program includes review by City staff, a Transportation Advisory Board (TAB) hearing, and project prioritization for funding (the City provides 50% of the funding for approved projects, citizens provide the other 50%). The graphic below shows a typical process that can be expected for a traffic calming project.

Traffic Calming Project Process

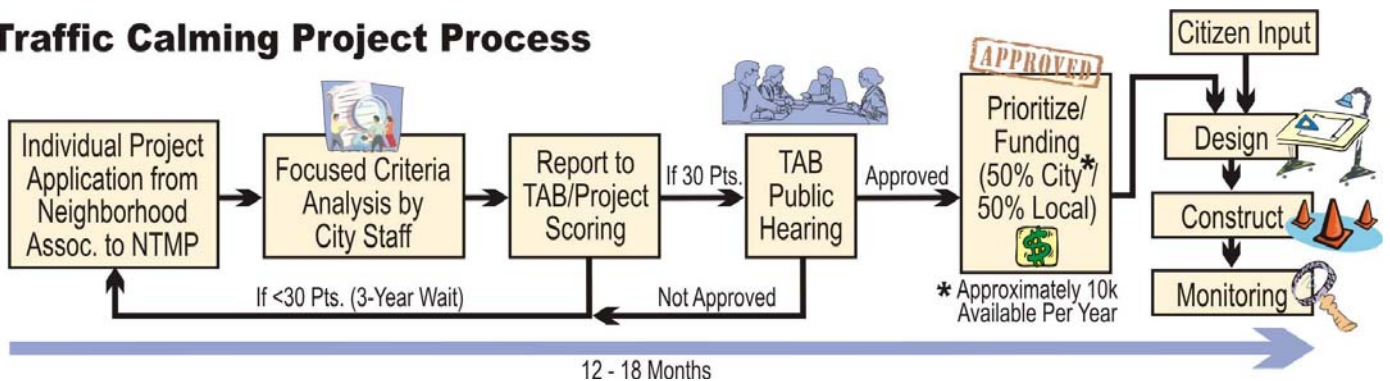




Table 6-1: Short-Term Action Plan Recommendations

| No. | Project | Description | Potential Funding Source |
|-------|---|---|--------------------------|
| TC-01 | North Shore/State Entry Treatment | Construct an entry treatment on North Shore at State Street. This could include curb extensions, neighborhood signing, and landscaping enhancements. | NTMP |
| TC-02 | C Avenue Entry Treatment | Construct an entry treatment on C Avenue at County Club Road. This could include curb extensions, neighborhood signing, and landscaping enhancements. | NTMP |
| TC-03 | C Avenue Speed Reduction | Install speed bumps on C Avenue between Country Club and 10th Street. | NTMP |
| TC-04 | Ellis Temporary Intersection Improvements | Install striping and reflectors to re-align and narrow the intersections of Ellis/Berwick and Ellis/Lake Forest. | Roadway Maintenance |
| TC-05 | First Addition Stop Sign Strategy | Implement alternating two-way stops between B, F, 5th, and 10th. Trim vegetation at intersections with sight distance restrictions | Roadway Maintenance |
| TC-06 | Vegetation Trimming | Have FAN/Evergreen develop an action plan and deliver to the City for review and implementation that will trim vegetation, as necessary, at intersections with sight distance restrictions during the stop sign installation. | Roadway Maintenance |

Table 6-2: Long-Term Action Plan Recommendations

| No. | Project | Description | Potential Funding Source |
|-------|--|--|--------------------------|
| TC-07 | Berwick/10 th Traffic Circle | Construct a traffic circle at Berwick/10th | NTMP |
| TC-08 | Iron Mountain Entry Treatments | Construct curb extensions to narrow the intersections of Iron Mountain/Chandler, Iron Mountain/Berwick, Iron Mountain/Troon, and Iron Mountain/Pine Valley | NTMP |
| TC-09 | D and E Avenue Entry Treatments | Construct entry treatments on D Avenue and E Avenue between 1st and 2nd consisting of curb extensions, neighborhood signing, and landscaping enhancements | NTMP |
| TC-10 | Bayberry Entry Treatment | Construct entry treatments on Bayberry near County Club, which could include realignment of the intersection with Country Club, neighborhood signing, and landscaping enhancements | NTMP |
| TC-11 | C and D Avenue Diverters | If D Avenue is extended across State Street, construct diverters on D Avenue and E Avenue at 1st Street to restrict east-west flow. | Development Mitigation |
| TC-12 | Durham Access | If redevelopment occurs at the Village Shopping Center, restrict southbound access to Durham. | Development Mitigation |
| TC-13 | Westward Ho Speed Reduction | Install speed bumps on Westward Ho between Pine Valley and Berwick | NTMP |
| TC-14 | Ellis Permanent Intersection Improvements | Construct curb extensions to permanently re-align and narrow the intersection of Ellis/Berwick and Ellis/Lake Forest | Roadway Maintenance |
| TC-15 | Expanded First Addition Stop Sign Strategy | Expand the alternating two-way stops to the east (to 1st Street). | Roadway Maintenance |
| TC-16 | 5 th /B Traffic Circle | Construct a traffic circle at 5 th /B if the transit center is relocated. | NTMP/Urban Renewal |

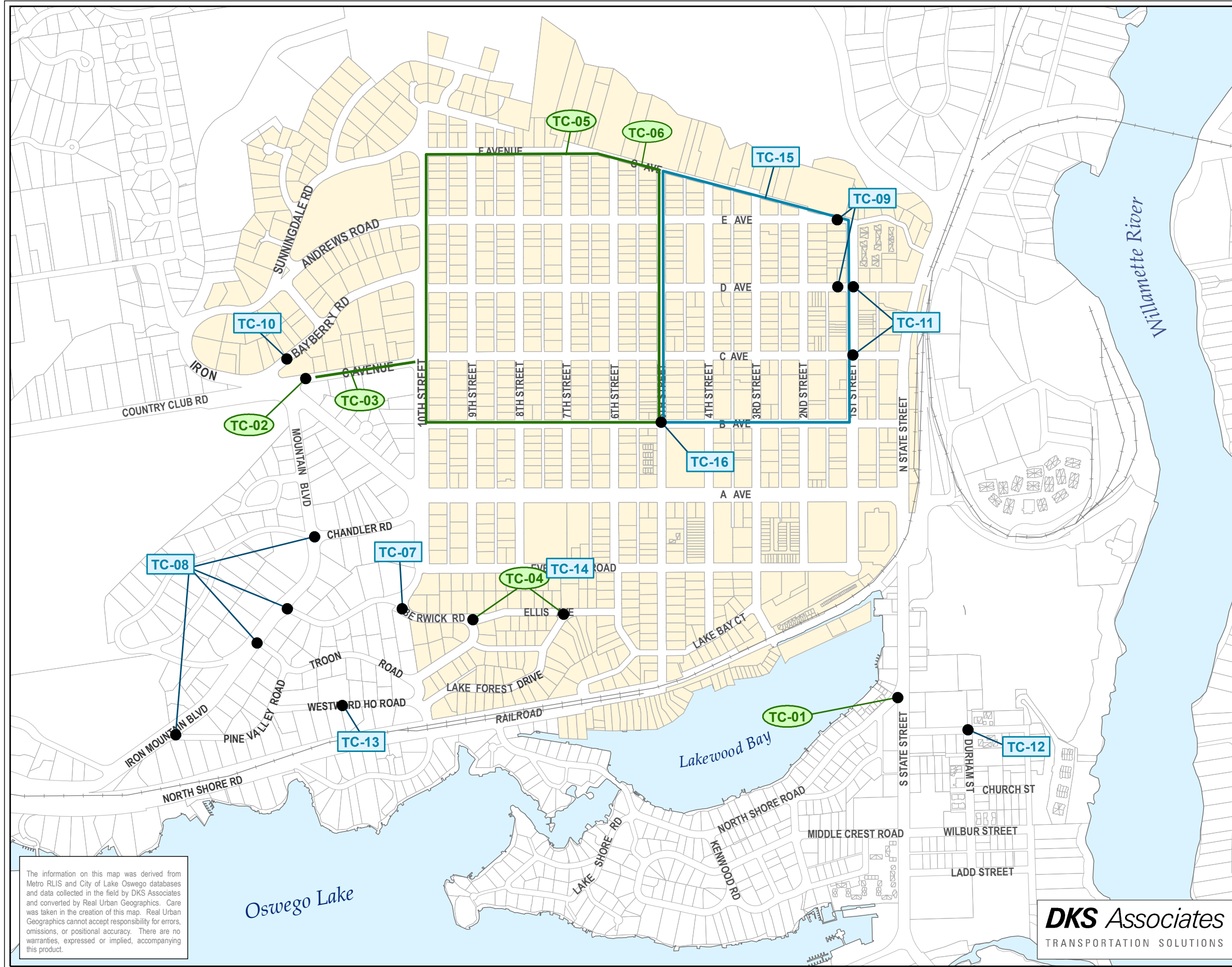
LAKE OSWEGO

Downtown Area-Wide
Transportation
Management Plan



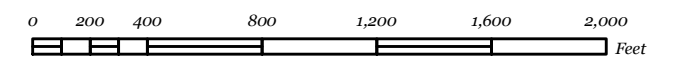
FIGURE 6 - 1

Traffic Calming Action Plan



Legend

- STUDY AREA
- TAXLOTS
- RAILROAD
- TC-00 SHORT-TERM PROJECT
- TC-00 LONG-TERM PROJECT



NOT TO SCALE

DKS Associates
TRANSPORTATION SOLUTIONS

The information on this map was derived from Metro RLIS and City of Lake Oswego databases and data collected in the field by DKS Associates and converted by Real Urban Geographics. Care was taken in the creation of this map. Real Urban Geographics cannot accept responsibility for errors, omissions, or positional accuracy. There are no warranties, expressed or implied, accompanying this product.



7. Walking Plan

Introduction

Historically, the neighborhood streets surrounding downtown Lake Oswego have operated without separated pedestrian pathways. However, as traffic volume increases and an aging driver population grows, the need for a through network of safe pedestrian facilities that connects key pedestrian generators becomes more critical for safety. The walking plan for downtown neighborhoods focuses on issues of accessibility for all people, safety for pedestrians and bicyclists (including safe routes to school), and maintaining the country-lane character of the neighborhood streets.

Chapter 5 presents a pathway design option for providing this connected network. This chapter presents alternatives analysis for locating walking plan projects, developed from community input. As the ability to implement pathway projects depends on neighborhood support, the prioritization of the projects not already identified in adopted City plans will be developed through additional citizen involvement (for this draft, these projects were assumed to be long-term alternatives). The following sections present the alternatives considered for the walking plan, including a discussion of Safe Routes to School policy. The recommended alternatives create a Walking Action Plan.

Safe Routes to School (SR2S)

The safe routes to school program (SR2S) has gained national momentum as a method to improve community livability. The National Highway Traffic Safety Administration (NHTSA) has published community guidelines on how to create a safe route to school program¹. Because safe routes to school were a priority for neighbors in the study area, the following steps were incorporated in the development of this plan to be consistent with NHTSA guidelines:

- Survey neighbors on the safety of the streets they use to walk to school
- Map the streets that connect to the school
- Inventory pedestrian facilities, motor vehicle volume, and motor vehicle speeds on the routes connecting to the school
- Consider traffic calming measures on streets in the neighborhood
- Consider pedestrian crossing enhancements where conflicts between pedestrian and other modes may occur

¹ Safe Routes to School – Safe Streets, viewed at the NHTSA website (<http://www.nhtsa.dot.gov/people/injury/pedbimot/bike/Safe-Routes-2002/safe.html>) on December 4, 2005.



The federal reauthorization funding bill (SAFETEA-LU) passed in 2005 provides funding specifically for SR2S projects. The Oregon Department of Transportation's SR2S program includes approximately \$1 million in funding per year through 2010 (for projects statewide)². Safe route to school programs combine both capital improvements to fill gaps and build safe pathways as well as education and outreach programs aimed at system users.

Pathway Projects

Pathways were identified for several locations within the study area to address the highest pedestrian activity levels. The following sections describe and evaluate the alternatives created by citizens to address these issues (grouped by geographic areas).

First Addition Neighborhood

Citizen Identified Alternatives

Neighbors in First Addition identified the following project goals:

- Improving pedestrian and bike safety for children
- Providing pedestrian corridors through neighborhoods
- Linking neighborhoods to downtown and activity centers
- Providing accessibility for all residents.

To meet these goals, the following pathway options were identified by project participants:

1. **Pathway** on 10th Street from A to E
2. **Pathway** on B Avenue from 8th to 10th
3. **Pathway** on 4th Street and G Avenue to the Adult Community Center.
4. **Pathway** on E Avenue from 4th to 10th
5. **Pathway** improvements on Andrews Road from 10th to Forest Hills School
6. **Bicycle Safety Markings** on C Avenue from Country Club to 1st Street

Evaluation

Each of the pathway project alternatives identified would improve pedestrian accessibility in First Addition. The projects that would provide the most benefit to the pedestrian facility system include 10th, 4th/G, Andrews, and E because they would serve the highest pedestrian volume corridors in the neighborhood. In addition, the 10th, Andrews, and E projects would improve safe routes to school.

² Oregon Department of Transportation – Safe Routes to School website (http://egov.oregon.gov/ODOT/HWY/BIKEPED/safe_route_to_school.shtml), viewed on February 26, 2006.

A pathway is currently under design on 10th Street from Evergreen to E (which could include some crossing enhancements at 10th/E). This project could be a prototype for the type of pathway desired in the neighborhood, potentially including green-street³ features. The 4th/G project is identified in the City's Transportation System Plan (TSP) and therefore, is eligible for the City's Pathway Program. The other projects would require an update to the TSP before they would be eligible for the City's Pathway Program.

The B Avenue project is two blocks long and would complete an east-west route through First Addition. There is an opportunity to coordinate with the 10th Street pathway design and construction project since they intersect.

The suggested bicycle safety markings on C Avenue could include symbols similar to what the City of Portland uses for bicycle boulevards (shown to the right). These symbols would be placed within the existing paved area on C Avenue. C Avenue is a lower motor vehicle volume street that could be an alternative bicycle route from Six Corners to State Street (compared to A Avenue). This project is not identified in the City's TSP, although it would be the only designated bicycle route through the First Addition neighborhood. Citizen support varied significantly for this project and therefore, it is a lower priority for the neighborhood.



Bike Safety Markings in Portland
Source: BikePortland.org

E Avenue Work-Session

The Working Team and the Citizen Advisory Committee (CAT) agreed that the decision to recommend a pathway in the FAN neighborhood required the involvement of people who live or own property on the affected street. For that reason, a meeting was called to invite comment from all property owners and residents on E Avenue (which is listed as a recommended improvement location in the City's Trails and Pathways Master Plan).

A letter was sent from City staff to each owner and/or resident with a frontage on E Avenue approximately two weeks before a meeting was held to receive their feedback. The meeting was held on February 2, 2006. Thirty three people were in attendance along with a staff facilitator and a member of the consultant team. Eleven of those identified themselves as property owners on E Avenue. The attendance record is included in the Appendix. Special efforts were made to assure that everyone at the meeting would be allowed to speak, regardless of their position on the issue of a pathway. It was explained that the purpose of

³ A green-street is a street designed with tree canopies and vegetated drainage areas to intercept and manage storm-water run-off.



the meeting was to determine if a recommendation should be made about this pathway in the Transportation Management Plan for Downtown Neighborhoods. Staff shared that there was no identified funding to make this a project at this time.

Seven people from E Avenue spoke in support of the pathway, one person spoke in opposition and another person stated that they were unsure. Four additional letters of support were received by City staff from other neighbors on E Avenue, two were received in opposition and one was not clear enough to make a determination. Since the majority of people from E Avenue who chose to participate in the process expressed support for the pathway (about 70%), it is included as a recommendation this plan.

It should also be noted that comments were also received at the meeting from neighbors who lived on nearby streets between D and G Avenues. Fourteen expressed their support for a pathway in this location and none expressed opposition. With those neighbors included, overall support expressed for this location from the people who chose to share their opinion in this forum increases to over 80%.

Expectations and hopes for the design of the pathway were expressed. There was interest from those in attendance to consider drainage as an important aspect of the project. A successful example from Seattle where natural drainage systems were developed to absorb storm water through creative landscaping was discussed. The meandering path and drainage systems used in that project were identified as an appropriate model for this future pathway on E Avenue.



Sample Green-Street in Seattle, WA
Source: Seattle Public Utilities, Street Edge Alternative

Recommendation

Based on this evaluation, the following projects are recommended:

- Short Term: Construct pathways on 10th Street from A to E, 4th Street/G Avenue from E to the Adult Community Center, B Avenue from 10th to 8th, and E Avenue from 4th to 10th.
- Long Term: Improve the sidewalk on Andrews Road from 10th to Forest Hills School. Stripe bicycle safety markings on C from Country Club to 1st.



Evergreen Neighborhood

Citizen Identified Alternatives

Neighbors in Evergreen identified the following goals:

- Improving pedestrian and bike safety for children
- Providing pedestrian corridors through neighborhoods
- Linking neighborhoods to downtown and activity centers
- Providing accessibility for all residents young and old

To meet these goals, the following pathway options were identified by project participants:

1. **Pathway** on 10th Street from A to Berwick
2. **Pathway** on Evergreen from 4th to 10th
3. **Pathway** on Berwick from Ellis to Berwick Ct.
4. **Pedestrian Area** Lake Bay Ct. from 6th to 3rd

Evaluation

Each of the pathway project alternatives would improve pedestrian accessibility in the Evergreen neighborhood. The projects that would provide the most benefit to the pedestrian facility system include 10th and Evergreen, as they would provide a pathway framework connection through the neighborhood.

The Evergreen and Lake Bay Court projects would connect the neighborhood to downtown, Millennium Park, and the recently completed Headlee Walkway project. Neighbors have expressed concern with a separate pathway on Lake Bay Court, preferring to have a shared roadway with a striped pathway zone. Due to the width of Lake Bay Court, striping a pedestrian zone on the existing roadway would impact on-street parking on one-side of the roadway. Today, Lake Bay Court is 32-foot wide with 18 feet for travel lanes and 7 feet available for parking on both sides ($18 + 7 + 7 = 32$). With a pathway, one of the 7-foot parking areas would be striped for pedestrian traffic. The loss of parking on one-side of the street was not supported by neighbors.

The geometry at the intersection of Berwick/Ellis creates potential conflicts between pedestrians and motor vehicles due to a lack of sight distance around the curves. A pathway on the outside of the curve on Berwick Road would reduce conflicts between vehicles and pedestrians. The City has recently approved a neighborhood enhancement grant to construct this project, making it a high priority.

A pathway on Cabana Lane would provide a connection from the downtown core to the Lakewood neighborhood. This connection, in combination with the Headlee Walkway, would begin to form a formal loop pathway around Lakewood Bay.



A pathway is currently under design on 10th Street from Evergreen to E. This project could be a prototype for the type of pathway desired in the neighborhood, potentially including green-street⁴ features.

Recommendation

Based on this evaluation, the following projects are recommended:

- Short Term: Construct pathways on 10th Street from A to Evergreen and on Berwick from Ellis to Berwick Court..
- Long Term: Construct pathways on Evergreen from 4th to 10th, Cabana Lane from North Shore to Lake Bay Court.

Lakewood Neighborhood

Evaluation

North Shore Road does not include pedestrian facilities. The motor vehicle volumes and speeds on this roadway exceed local street standards, which could increase the conflict potential between vehicles and pedestrians. In addition, although this roadway provides a connection around the lake, several neighbors expressed concern and did not support a pathway improvement project. The close proximity of structures and the narrow right of way limit the physical space to provide a continuous path. Therefore, there are no recommended actions within the Lakewood neighborhood.

Old Town Neighborhood

Citizen Identified Alternatives

Neighbors in Old Town pathway and crossing improvement options to enhance pedestrian safety and improve pedestrian connectivity:

1. **Pathway** on Durham from Wilbur to Ladd
2. **Curb Extensions** on Leonard at State

Evaluation

Neighbors have reported that traffic from customers visiting the Village Shopping Center utilizes Durham Road to avoid traffic on State Street. There are incomplete sidewalks on Durham from Wilbur to Ladd (120-foot gap on the east side of Durham), which puts pedestrians in conflict with motor vehicles. A pathway on this roadway would link George Rogers Park to nearby shopping. A pedestrian facility on Durham would connect to the planned Ladd Street green-street project that will provide enhanced pedestrian facilities and traffic calming features on Ladd Street from State to George Rogers Park. Improving

⁴ A green-street is a street designed with tree canopies and vegetated drainage areas to intercept and manage storm-water run-off.



Durham will become a higher priority as motor vehicle traffic growth occurs in the future and volumes approach local street thresholds (1,200 ADWT). This improvement is identified in the Old Town Neighborhood Plan (Durham is listed as the neighborhood's walking street). To support the main street design of Durham, this pathway should be constructed with landscaped separation from the roadway.

Neighbors have reported that pedestrian safety is a concern on the east leg crossing at Leonard/State Street. This location could be improved with curb extensions on Leonard as part of future redevelopment at the Village Shopping Center.

Recommendation

Based on this evaluation, the following project is recommended:

- Long Term: Construct a pathway or a sidewalk on the east side of Durham to complete the connection from Wilbur to Ladd. Construct curb extensions on Leonard at State as part of redevelopment of the shopping center.

Pedestrian Crossing Projects

Neighbors identified a need for safe crossings for pedestrians. Crossings of A Avenue west of 4th, B Avenue between 1st and 4th, 10th Street at E, and Evergreen Road at 3rd were specifically mentioned.

Citizen Identified Alternatives

The following options were identified by project participants:

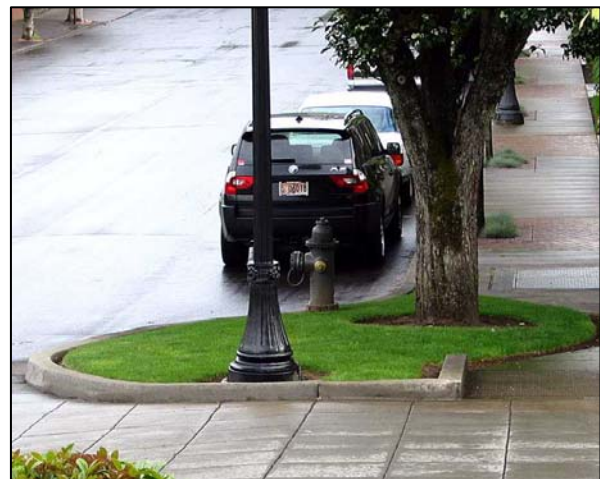
1. **All-Way Stops** on B at 1st, 2nd, and 3rd
2. **Signalization** of A at 5th
3. **Curb Extensions** on B at 1st, 2nd and 3rd.
4. **Crossing Enhancements** on A at 5th.
5. **Crossing Enhancements** on 10th at E
6. **Crosswalk Striping** on Evergreen at 3rd.
7. **Jaywalking Enforcement** on A Avenue.

Evaluation

The suggested all-way stops and signalization are not warranted based on criteria for specific traffic volumes, pedestrians, and crashes at the suggested locations. In addition, all-way stop installations on B Avenue would potentially divert cut-through traffic onto other east-west roadways in First Addition (e.g. D and E), creating secondary impacts.

Curb extensions on B Avenue would shadow the on-street parking (extending into the street the same distance as the on-street parking area), similar to the existing curb extensions on these roadways shown in the figure to the right.

Pedestrian safety is an issue at these locations and curb extensions would improve pedestrian visibility, reduce crossing distance, and slow traffic by providing a traffic calming effect. They may have minor impact to on-street parking. In addition, providing crosswalk striping on B Avenue with the provision of curb extensions may improve driver yielding behavior. Curb extensions are currently being constructed at B/1st as part of development mitigation.



Curb Extension Shadowing On-Street Parking

Crossing enhancements on A Avenue at 5th street could consist of unsignalized crossing enhancements that could significantly enhance crossing safety. Today, ladder style striping



is used to mark the A/5th crossings on both the east and west legs. However, there are several improvements that can be made to significantly improve this treatment. First, a median on the east leg could be constructed that would provide a refuge area as pedestrians cross and wait for gaps in both the eastbound and westbound traffic stream. With this median in place, westbound left turns onto 5th Street would be prohibited for motor vehicle safety on A Avenue (requiring additional signing), diverting vehicles to the alley between 4th Street and 5th Street or to 6th Street. Second, a curb extension would be could be constructed on the south side of A Avenue (east leg) to shorten the pedestrian crossing distance. Third, advance stop bar striping and yield to pedestrian signing could be installed in both the eastbound and westbound direction on A Avenue. Fourth, pedestrian level lighting could be installed that would improve pedestrian visibility in the crossing area. Fifth, the recently constructed curb extension on the north side of A Avenue (east leg) could be modified by moving the street trees further from the traveled way (possibly using tree wells) to improve pedestrian sight distance on the north side of the crossing area. Finally, the ladder style striping on the west leg would be removed to encourage pedestrians to use the east leg crossing.

Pedestrian safety is also a concern at A/4th, where collisions have occurred in the past. During the course of this study, the City of Lake Oswego implemented advance pedestrian phasing for the crossing of A Avenue. When crossing A Avenue, pedestrians are given the walk signal 4 seconds before the vehicles on 4th are given a green light (all motor vehicle signal indications are red). This advanced walk sign is intended to allow pedestrians to enter the intersection prior to vehicles, improving their visibility. After two more years of operation, this location should be evaluated to determine if the desired result (no collisions) as occurred.

An enhanced pedestrian crossing at 10th/E could include a raised intersection, lighting, and flashers to improve pedestrian visibility. This intersection serves the largest number of pedestrians observed in the study area and is the gateway to Forest Hills School. As this location is controlled by a traffic crossing guard during peak school hours and pedestrian collisions were not recorded, capital investment to improve the roadway is not a high priority.

The intersection of Evergreen/3rd is all-way stop controlled for motor vehicles. Striping a pedestrian crossing could improve driver yielding behavior, although it would not change the operation of the intersection and there were no safety issues verified at this location.

Jaywalking on A Avenue was noted as a safety and congestion concern between State Street and 4th Street, where pedestrians cross at signals without a crossing indication and conflict with vehicle movements. Citizens should work with City staff to identify specific locations and times that can be forwarded to City of Lake Oswego Police for increased enforcement.



Recommendation

Based on this evaluation, the following projects are recommended:

- Short Term: Construct curb extensions on B Avenue at 2nd and 3rd. Construct pedestrian crossing enhancements on A Avenue at 5th. Conduct an after study at A Avenue/4th Street, where the signal timing modifications have been implemented.
- Long Term: Construct crossing enhancements at 10th/E.

Recommended Action Plan

Based on the results of the alternatives analysis and the recommended project priorities, short term and long term action plans were created and are listed in Tables 7-1 and 7-2. Actions recommended for the short-term address issues that were verified under existing conditions. Long-term recommended actions address potential future issues. Figure 7-1 shows the locations of these projects.

The typical implementation process that can be expected for the pathway projects is shown below. The first step of the process is to have the project added to the City's Transportation System Plan (TSP), which is generally updated every 5 to 10 years. Once added to the TSP, projects can either be carried forward through the City's Capital Improvement Program (CIP) or through the Neighborhood Pathway Program (where neighborhood associates can apply to the Neighborhood Pathway Program). If the project is approved, it will compete for funding with other citywide projects (approximately one pathway project is funded per year).

Pathway Project Process

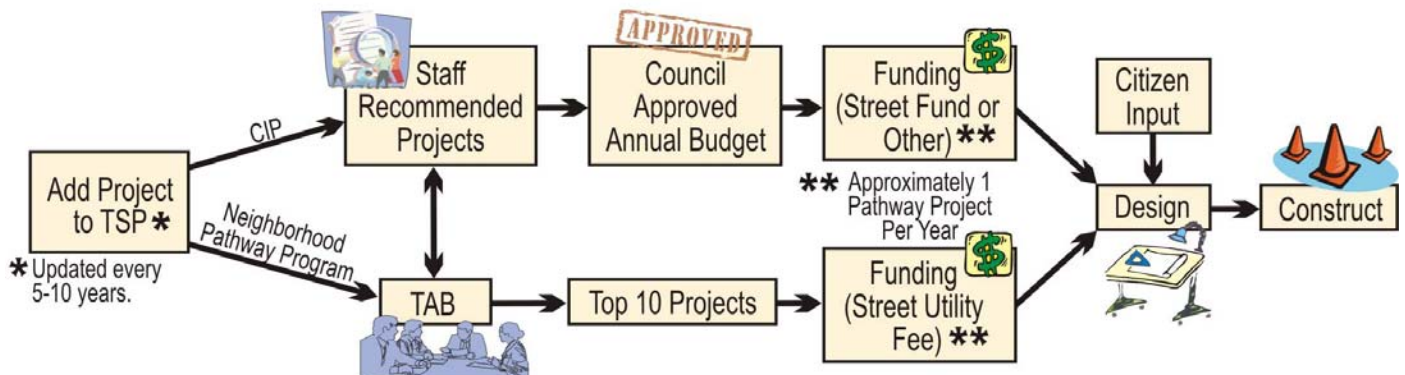




Table 7-1: Short-Term Action Plan Recommendations

| No. | Project | Description | Potential Funding Source |
|------|---|--|--------------------------|
| W-01 | 10 th St Pathway -FAN | Construct a pathway on 10 th St from A to E | Pathway Program |
| W-02 | 4 th St Pathway | Construct a pathway on 4 th St from E to the Adult Community Center | Pathway Program |
| W-03 | B Ave Crossings | Construct curb extensions on B Ave at 2 nd and 3 rd , including striping the crossing. | Development Mitigation |
| W-04 | A Ave Crossing | Construct crossing enhancements on A Ave at 5 th , including a median, curb extension, turn restrictions, striping, signing, and pedestrian level lighting. | Urban Renewal |
| W-05 | 10 th St Pathway – Evergreen | Construct a pathway on 10 th St from Berwick to A | Pathway Program |
| W-06 | B Ave Pathway | Construct a pathway on B Ave from 10 th to 8 th | Pathway Program |
| W-07 | E Ave Pathway | Construct a pathway on E Ave from 10 th to 4 th | Pathway Program |
| W-08 | Evergreen Pathway | Construct a pathway on Evergreen Rd from 10 th to 4 th | Pathway Program |
| W-09 | Berwick Pathway | Construct a pathway on Berwick from Ellis to Berwick Court | Neighborhood Enhancement |

Table 7-2: Long-Term Action Plan Recommendations

| No. | Project | Description | Potential Funding Source |
|------|------------------------------|--|--------------------------|
| W-10 | Andrews Rd Pathway | Re-construct the pathway on the north side of the road to include a curbed sidewalk and improved on-street parking | Pathway Program |
| W-11 | C Ave Bike Striping | Stripe bicycle safety markings on C Avenue between Country Club and 1 st Street. | Roadway Maintenance |
| W-12 | 10 th /E Crossing | Improve the intersection of 10 th /E with lighting and raised pavement to enhance pedestrian safety | Pathway Program |
| W-13 | Durham Pathway | Construct a sidewalk or pathway on Durham from Ladd to Wilbur, including landscaped separation from the roadway. | Pathway Program |
| W-14 | Leonard Crossing | Construct curb extensions on Leonard at State as part of future redevelopment of the Village Shopping Center | Development Mitigation |

In addition to these action plan projects, there are several projects identified in the City’s Capital Improvement Plan (CIP) that will provide additional pedestrian facilities in the study area or provide opportunity for additional pathway projects. For example, the CIP includes projects at Millennium Plaza Park and Lakewood Bay to improve disabled person accessibility and provide additional pathways. The CIP also includes programmatic projects in the study area, including the pathway program, the D Avenue storm drainage project, and the ADA (Americans with Disabilities Act) funds.

The City’s TSP also identified a future bicycle project to construct bike lanes on B Avenue from State to 4th, on 4th Avenue from A to B, and on A Avenue from 4th to the west. This



project would provide additional bicycle connectivity in downtown Lake Oswego. As an alternative to this project, the next TSP update could consider keeping the bike route on B Avenue between 4th Street and 10th Street (possibly a bike boulevard), and then connecting to A Avenue at 10th or Country Club Road via C Avenue.

LAKE OSWEGO



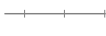
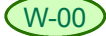

Downtown Area-Wide
Transportation
Management Plan

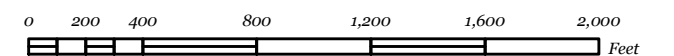


FIGURE 7 - 1

Walking Action Plan

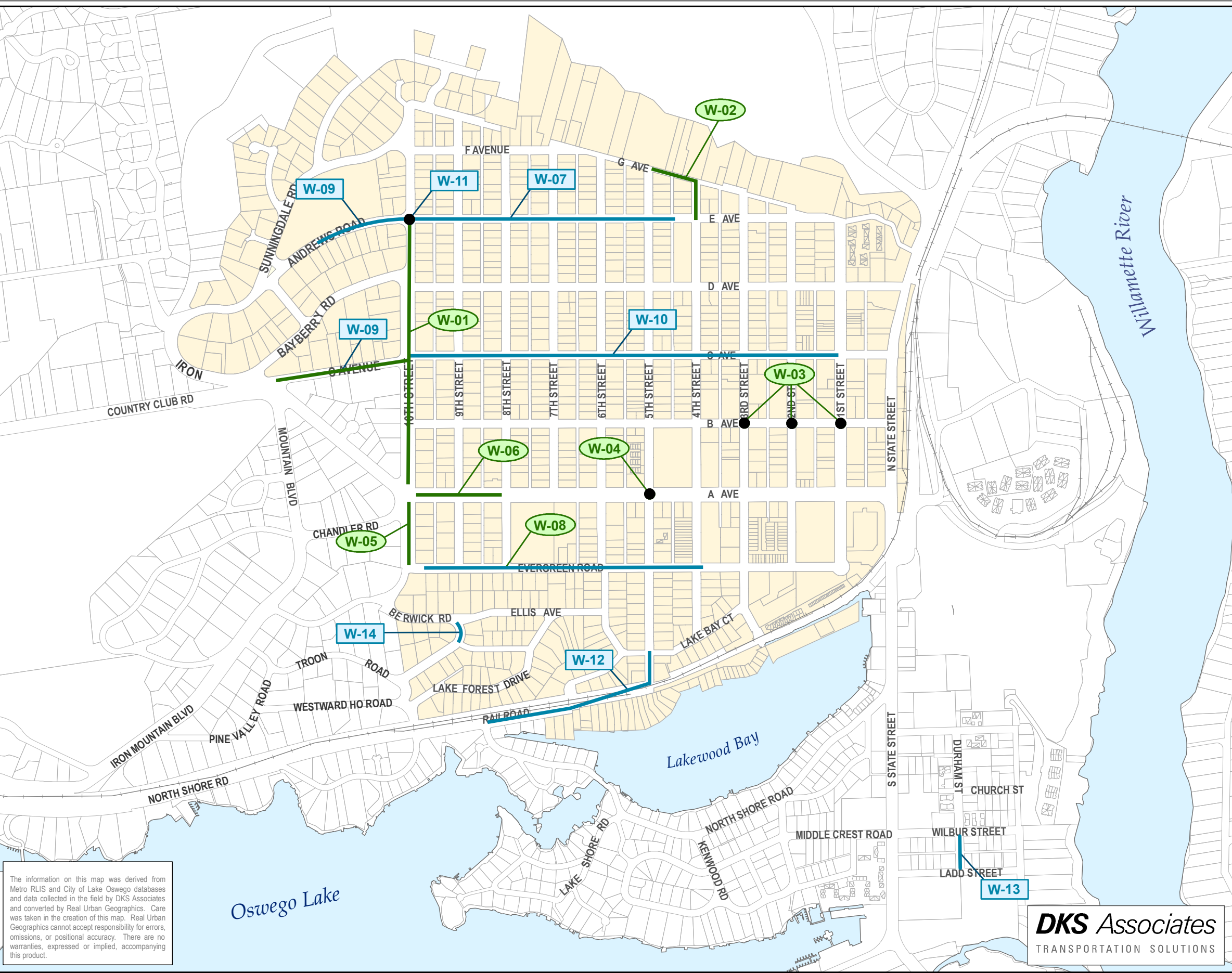
Legend

-  STUDY AREA
-  TAXLOTS
-  RAILROAD
-  SHORT-TERM PROJECT
-  LONG-TERM PROJECT



NOT TO SCALE

DKS Associates
TRANSPORTATION SOLUTIONS



The information on this map was derived from Metro RLIS and City of Lake Oswego databases and data collected in the field by DKS Associates and converted by Real Urban Geographics. Care was taken in the creation of this map. Real Urban Geographics cannot accept responsibility for errors, omissions, or positional accuracy. There are no warranties, expressed or implied, accompanying this product.



8. Parking Plan

Introduction

The parking analysis conducted as part of the plan found that future increases in off-street parking demand would be met if future development provided off-street parking according to the City's code. However, there are several existing areas of downtown that experience on-street parking availability constraints. In addition, the consolidation and location of future parking supply is a key issue in creating a vibrant downtown that supports a walkable urban environment. This parking plan focuses on alternatives to address these on-street parking issues.

On-Street Parking Supply

The availability of parking space in the commercial core of the study area is an important issue for residential neighbors surrounding the downtown area and for the businesses that operate within it. Neighbors wish to avoid having downtown parkers intrude onto residential streets. The issues analysis found that on-street parking demands were high surrounding the US Post Office, the Library, the transit center, and Millennium Park at certain times and days of the week.

Citizen Identified Alternatives

To address these issues, project participants identified the following alternatives:

1. **Parking Time Limits** reviewed and expanded to a larger area.
2. **Reduce Bus Layover Parking** on B Avenue between 4th and 5th.
3. **Utilize Off-Street Parking** by making private parking lots available to the public.

Alternative Evaluation

Areas in the commercial core with the highest on-street parking use by employees may benefit from shorter parking time limits (as compared to unlimited conditions) that would increase parking space turnover and make on-street parking more accessible to customers. This action would need to consider adequate provision of employee parking (e.g. the Lakeview Village garage) or implementation of a transportation demand management program (e.g. subsidized transit passes or carpooling) to reduce employee parking demand. Locations for this improvement would be determined through coordination with local businesses. Potential locations for implementation include 3rd Street from A Avenue to Lake Bay Court, Evergreen Road from 1st to 3rd Streets, and North Shore near State Street.

TriMet has recently reduced the size of their layover area, which resulted in two additional on-street parking spaces on B between 4th and 5th.



Making off-street parking on private property publicly accessible could optimize the use of available parking in congested areas, but would require coordination with property owners to determine hours of sharing and possible parking pricing. This policy approach could be effective for handling special event parking surrounding Millennium Park, where several off-street lots are restricted for private parking but aren't fully occupied during the weekend. Such arrangements can be encouraged and established through agreements during the approval for new development in the downtown as part of a parking management district.

In addition to these alternatives, the relationship between off-street parking code requirements and the on-street parking conditions could be further examined. Code requirements assure that some additional off-street parking is provided by future development, but the minimum parking requirements do not provide enough off-street parking to meet the forecasted increase in demand (while maintaining on-street parking occupancy levels) and it does not address the location of these off-street parking facilities in relation to overall parking demand (including on-street parking). However, the City policy could be modified to address issues that occur today, such as employee parking occupying on-street public parking spaces. An alternative that should be considered includes constructing a centralized public parking facility.

Constructing a centralized parking facility would avoid having to create space for off-street parking with each new development, maximizing the developable lands for the downtown mixed-use developments and providing a more pedestrian friendly environment. Lakeview Village provides an example of this. The centralized parking facility provides an opportunity for enhanced way-finding to un-identifiable destinations for trips from outside the area, reducing the amount of traffic distributed to various smaller lots throughout the downtown. A consolidated parking facility might be developed through a public/private partnership and could serve both private (employee) and public (customer) parking needs. In addition, increasing the parking supply in a central location could significantly affect on-street parking concentrations associated with lack of off-street parking (such as the US Post Office). Development fees collected in-lieu of providing on-site parking spaces might generate the funding for public investment in a centralized parking facility. Feedback from downtown business owners at the March 22, 2006 public forum indicated that to be feasible for development, the parking garage should be funded and constructed by the City prior to implement the in-lieu fees, so that the spaces would be available as development occurs (City would recover funds as development occurs and fees are collected).



Sample Way-Finding Enhancement



The optimal locations for a central parking garage, based on existing demand and anticipated future land use patterns, would be in the six-block downtown area bounded by State Street, 3rd Street, Evergreen Road, and B Avenue. The preferred location, based on feedback from the neighbors and the Transportation Advisory Board is between State Street, 2nd Street, B Avenue, and C Avenue.

Recommendation

Based on this evaluation, the following strategies should be considered to manage on-street parking conditions in downtown Lake Oswego:

- Conduct a comprehensive review of parking time restrictions in downtown. Implement parking time limits on streets with the highest level of parking, including 3rd Street from A to Lake Bay and Evergreen from 1st to 3rd. Consider varying parking time limits by time of day.
- Encourage voluntary parking sharing agreements with new development to make their off-street parking publicly accessible during non-peak times.
- Construct a centralized public parking facility in the area bounded by State, 2nd, B, and C. Consider collecting development fees in-lieu of providing off-street parking to help fund the facility.

Transit Center Location

Neighbors have identified the transit center as a problematic area for parking occupancy, both for neighborhood intrusion and business impacts. Transit riders are said to hide-and-ride, parking all day in the Safeway lot, in front of businesses, or on surrounding residential streets. The parking observations conducted for this study did not indicate that the transit center was significantly impacting parking availability in the area beyond what could not be addressed by expanding existing parking time limitations. However, the complexity of transit service location and needs, parking supply, and parking enforcement in downtown Lake Oswego necessitates additional study beyond the scope of the current plan, including:

- Coordination with the Lake Oswego Downtown Transit Alternatives process.
- Circulation of TriMet routes
- Location of parking spaces to provide access to the transit stop location
- Origin-destination analysis of the transit center facility

Therefore, this plan recommends continued support of the relocation of the transit center to State Street in coordination with the east-end redevelopment plan, the Foothills area planning process, and the downtown transit alternatives analysis. The current downtown redevelopment plan outlines a future transit center location near State Street that would remove this issue associated with the current 4th Street location.



Recommended Action Plan

Future conditions analysis found that on-street parking occupancy will increase in the downtown core with the implementation of current City minimum parking requirements. However, there are no specific recommended improvement projects associated with this parking plan. Policy options to manage parking time restrictions, off-street parking use, implement current code required off-street parking, and provide a centralized parking facility should be further explored with the downtown businesses. Should a centralized parking facility be considered, it would require a size, location, financing, and way-finding plan.



9. Implementation

Introduction

This study found that growth in downtown Lake Oswego will have a limited impact upon traffic in the surrounding neighborhoods. Growth and development outside the study area posed a greater traffic impact upon local residential streets. The key to managing growth in the downtown area will be monitoring conditions on study area streets.

In addition to measuring the impacts of downtown growth, this plan created Traffic Calming, Walking, and Parking plans to address existing issues identified by neighbors and those intensified by regional growth. To implement these plans and monitor growth, implementation strategies are needed to establish new city policies, address project funding and manage capital project implementation.

Monitoring Downtown Growth

Implementing a transportation management plan for downtown development requires a strategy linked to the development review process. The first step to implementing this strategy is to require that all new major developments monitor traffic conditions on surrounding local streets and require mitigation for impacts that exceed local street standards. The City has an adopted traffic calming policy that establishes desirable volume and speed levels for local streets. This City policy could be expanded into development review, so that developments would not be allowed to exceed local street standard volume and speed thresholds without mitigation. If developments exceed these thresholds, they would be required to contribute to funding action plan elements of this study or to engage in a public involvement process to develop traffic calming solutions to mitigate their impacts on the residential streets. Key policy components required to incorporate this approach include:

- Adopt code requirements for local street analysis in traffic impact studies required for major new developments, including the consideration of the following measures for proposed projects:
 - Local residential street volumes should not increase above 1,200 ADWT.
 - Local residential street speeds should not exceed 28 mph (85th percentile speed) without mitigation.
 - Local residential street volumes should not be significantly increased by any proposed project without mitigation or proportional



contribution to management (40% increase¹ on streets with an existing ADWT below 400, 25% increase on streets with a higher existing volume).

The downtown development monitoring strategy places the burden on development review to track conditions in the neighborhoods surrounding downtown. Another approach to monitoring would be to create a city implemented monitoring program that measures the traffic volumes and speeds on several key roadways to make sure that the neighborhood is not being “overrun” from development. In addition, this monitoring could be used to adjust action plan priorities as development and regional growth occurs. Based on the cut-through analysis for this project, the following locations would be recommended for ongoing monitoring:

- E Avenue, D Avenue, C Avenue, B Avenue, and Evergreen Road between 4th and 5th
- North Shore near Kenwood
- Westward Ho east of Pine Valley
- Durham Road north of Wilbur Street

This city implemented monitoring program could be tied to Transportation System Plan updates, which are typically studied on a 5 year cycle.

Action Plan Project Costs

The Action Plans created for Traffic Calming and Walking include a series of short-term and long-term capital improvement projects. To provide a framework for funding discussion, planning level cost estimates were completed for these projects, which are listed in Table 9-1 and 9-2. The short-term action plan includes 15 projects that total approximately \$609,000. The long-term action plan includes 15 projects that total approximately \$318,000. These cost estimates are based on preliminary assessment. There are several caveats to these cost estimates that should be noted, including:

- Project costs are preliminary and further engineering and stakeholder involvement would be necessary to refine them. The estimates do not include right-of-way acquisition, project engineering fees, construction mobilization, and contingency (which can add up to 50% to 75% to cost for certain small custom projects).
- Project costs are based on 2005 dollars. Cost estimates in the future would be increased based on ENR (Engineering News Record) construction cost indexes (it can be expected that these costs will escalate at 3.5% per year based on the past 5 to 10 year history).

¹ Based upon the peak hour of the proposed project traffic and/or the adjacent street PM peak hour.



- Project costs do not include consideration of green-street features, which could significantly increase the cost of pathways. However, they may provide project synergy where pathway and green-street elements can be combined into one project.

Table 9-1: Short-Term Action Plan Recommendations Costs

| No. | Project | Cost |
|-------|---|-------------------|
| TC-01 | North Shore/State Street Gateway Treatment | \$50,000 |
| TC-02 | C Avenue Gateway Treatment | \$50,000 |
| TC-03 | C Avenue Speed Reduction | \$6,000 |
| TC-04 | Ellis Temporary Intersection Improvements | \$2,000 |
| TC-05 | First Addition Stop Sign Strategy | \$15,000 |
| TC-06 | Coordinate with property owners to trim vegetation, as necessary, at intersections with sight distance restrictions during the stop sign installation | \$8,000 |
| W-01 | 10 th St Pathway -FAN | Partially Funded* |
| W-02 | 4 th St Pathway | \$34,000 |
| W-03 | B Ave Crossings | \$30,000 |
| W-04 | A Ave Crossing Enhancements | \$90,000 |
| W-05 | 10 th St Pathway – Evergreen | Partially Funded* |
| W-06 | B Ave Pathway | \$48,000 |
| W-07 | E Ave Pathway | \$128,000 |
| W-08 | Evergreen Pathway | \$135,000 |
| W-09 | Berwick Pathway | \$13,000 |

TC – Traffic Calming

W – Walking

*The design for these projects is currently funded



Table 9-2: Long-Term Action Plan Recommendations Costs

| No. | Project | Cost |
|-------|--|----------|
| TC-07 | Berwick/10 th Traffic Circle | \$40,000 |
| TC-08 | Iron Mountain Gateway Treatments | \$40,000 |
| TC-09 | D and E Avenue Gateway Treatments | \$20,000 |
| TC-10 | Bayberry Gateway Treatment | \$10,000 |
| TC-11 | C and D Avenue Diverters | \$10,000 |
| TC-12 | Durham Access | \$5,000 |
| TC-13 | Westward Ho Speed Reduction | \$6,000 |
| TC-14 | Ellis Permanent Intersection Improvements | \$20,000 |
| TC-15 | Expanded First Addition Stop Sign Strategy | \$15,000 |
| TC-16 | 5 th /B Traffic Circle | \$40,000 |
| W-10 | Andrews Rd Pathway | \$47,000 |
| W-11 | C Ave Bike Blvd | \$5,000 |
| W-12 | 10 th /E Crossing | \$40,000 |
| W-13 | Durham Pathway | \$10,000 |
| W-14 | Leonard Crossing | \$10,000 |

TC – Traffic Calming
W – Walking

Funding Opportunities

Currently, there are no funding sources identified to implement projects identified in this plan. Feedback from the March 22, 2006 neighborhood forum indicated that in general, the neighbors feel that the total project cost is not too significant and that the City Council could authorize funds to cover the project costs. However, the Transportation Advisory Board raised concerns at their April 12, 2006 meeting that authorizing funds to implement projects for these neighborhoods would not be equitable to the other neighborhoods within the City and that the identified projects should compete in existing programs for implementation. The following sections discuss some potential funding options that could be utilized to fund plan projects.

Neighborhood Traffic Management Program (NTMP)

Projects that are eligible for City traffic calming program could be submitted by neighborhood associations into the NTMP process. Projects approved by the Transportation Advisory Board are funded 50% by the City (the remaining 50% is required neighborhood match). The City funding available for the NTMP is approximately \$10,000 per year.



Lake Oswego CIP (Pathways, Green-Streets, ADA)

Projects that are eligible for City traffic calming or pathway programs could be submitted to compete for City-wide funding. The current Capital Improvement Plan (CIP) includes programs for pathways, green streets, and ADA improvements that could potentially be used within the study area. Other CIP projects include storm water or athletic facility improvements, which could provide an opportunity to coordinate with an action plan project.

To be eligible for CIP funds, a project need to be included in the City's Transportation System Plan (TSP), which is updated every 5 to 10 years (e.g., the E Avenue pathway from 4th to 10th would need to be added to the TSP as a pathway project).

Development Mitigation

Action plan projects may be funded by future development where they can be linked to an anticipated project impact. As mentioned previously, this could take the form of project by project mitigation identification. Projects that might be required as development mitigation include the A Avenue and B Avenue pedestrian crossing improvements.

Urban Renewal Funds

The Lake Oswego Redevelopment Agency (LORA) manages urban renewal projects and funding in the downtown urban renewal district. The urban renewal area boundaries include portions of the First Addition, Evergreen, Foothills, and Old Town neighborhoods, with the core downtown area generally including the commercial area bounded by C Avenue, 5th Street, State Street, and Lakewood Bay. LORA utilizes tax increment financing to fund enhancement projects in the urban renewal area. Project identified in this plan that may be eligible for this funding source include the B Avenue crossings, Transit Center relocation, construction of a centralized parking facility, A Avenue crossings, and the 5th/B traffic circle.

Local Improvement District (LID)

Another option to funding these action plans would be the creation of a Local Improvement District (LID). To save costs in administering an LID, the fee could potentially be treated as a transportation utility fee and added as a line item to other utility fees (e.g. water bill). Within the study area (First Addition, Evergreen, Lakewood, and Old Town neighborhoods), a fee of approximately \$2 per month would generate \$900,000 over a 20 year period. However, administering such a program would require substantial City staff effort, which could be unwarranted based on the funding level identified in this plan.

Safe Routes to School (SR2S) Grants

The federal reauthorization funding bill (SAFETEA-LU) passed in 2005 provides funding specifically for SR2S projects. The State (ODOT Pedestrian and Bicycle Program) administers the SR2S program and divides money among school districts across the state. Projects connecting to Forest Hills Elementary School would be eligible for this competitive



grant program. Grant applications to ODOT would likely be a joint effort between the City and the school district.

Parking Development Fees

Development fees collected in-lieu of providing on-site parking spaces might generate the funding for public investment in a centralized parking facility in downtown Lake Oswego. Implementing in-lieu fees would require further study and coordination with downtown businesses to determine the size, location, and financing plan for the facility.

Action Plan Project Implementation

The action plans developed for this study focused on community involvement to identify and address key neighborhood issues. To optimize investment into these neighborhoods, an implementation strategy is needed to guide development and construction of each action plan project. Chapters 6 and 7 discuss the overall process that would generally be used to implement each of the traffic calming and pathway projects, including the roles of citizens, the Transportation Advisory Board, and the City's Neighborhood Traffic Management Program. The following sections discuss additional strategies to address project phasing and before/after studies.

Project Phasing

The projects identified in the action plans utilize a variety of traffic calming and pathway tools. Project phasing should be used to focus investment and provide the opportunity for project review prior to wide-spread investment. Several of the action plan projects identified phasing opportunities, including the stop sign location strategy in First Addition and the intersection alignment corrections in Evergreen.

Before/After Studies

A key to successfully implementing a long-term action plan in the study area will be monitoring the benefits and public satisfaction of each project with before/after studies. Once a project is constructed (e.g. curb extensions at Berwick/Ellis), data collection should be conducted 6 to 12 months afterwards to determine if the improvement measure was effective. For safety related projects, three years of data would be common in the after scenario. If the measure was not effective, refinements could be made to that improvement, or the results could be used to guide project development at other locations. In addition, neighbors surrounding the improvement measure should be interviewed to document satisfaction with the improvement. To manage this data collection, a database should be maintained that would include:

- Before/After Speeds (85th Percentile, percent above posted speed + 5 mph)
- Before/After Volumes (24-hour volume profile, AWDT)
- Neighbor Feedback/Residential Acceptance



The project cost estimates prepared for this plan do not include estimates for before/after studies. Cost for these studies varies based on the complexity and influence area of a project, but could typically range from \$2,500 to \$5,000. As an example, an after study for the 4th/A signal timing enhancements for pedestrians could include collection of 3 years of collision data, a video observation at the intersection to observe pedestrian/motor vehicle conflicts, and a brief staff report documenting the results. An after study for a driver feedback sign could include a 24-hour road tube speed survey and a staff report documenting the change in vehicle speed conditions.

High-Priority Projects

At the March 22nd, 2006 neighborhood forum, surveys were distributed that included an opportunity to indicate preferred projects. Based on approximately 25 completed forms, the following action plan projects appear to be high-priority and should be implemented first, if possible:

- First Addition Alternating Stop Signs (TC-05)
- Ellis Temporary Intersection Improvements (TC-04)
- A Avenue Crossing Enhancements at 5th (W-04)
- E Avenue Pathway from 10th to 4th (W-07)

City engineering staff has also reviewed the short-term action plan recommendations to determine if any of the projects could be funded under currently approved programs. The First Addition Alternating Stop Signs (TC-05), the corresponding intersection vegetation trimming (TC-06), and the Ellis Temporary Intersection Improvements (TC-04) could potentially be implemented under the existing roadway maintenance program. The other short-term traffic calming projects were determined to not beyond the scope of the current Capital Improvement Plan budget.