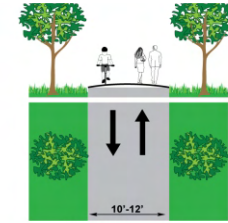


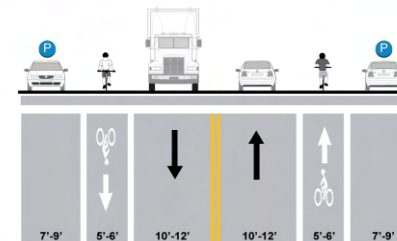
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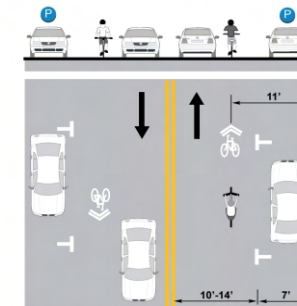
Non-Motorized Transportation Plan



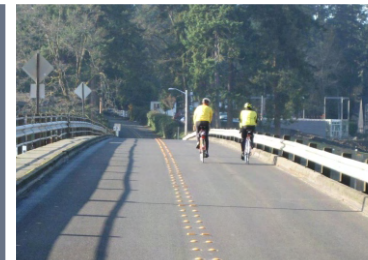
Shared Use Path



Bike Lane (Adjacent to Parking)



Signed Shared Lane



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Table of Contents

CHAPTER 1—EXECUTIVE SUMMARY	1	CHAPTER 4—EXISTING BICYCLE SYSTEM	39
Introduction	1	Introduction	39
Chapter 2 – Pedestrian System Inventory and Self-Evaluation	2	Revising the Bicycle Planning Language	39
Chapter 3 – Methodology for Prioritizing Pedestrian Projects	4	Bicycle Facilities	40
Attributes	4	Bikeway	40
Accessibility	4	Bicycle Lane	40
Planning-Level Cost Estimates	6	Designated Bicycle Routes	40
Chapter 4 – Existing Bicycle System	8	Shared Roadway	40
Chapter 5 – Non-Motorized Policy Guide	10	Shared-Use Path	40
Chapter 6 – Local Non-Motorized Design Guide	10	Defining Bicycle Users	41
Chapter 7 – Wayfinding Guide	11	Local Geography	41
Chapter 8 – Pedestrian and Bicycle System Plans	11	CHAPTER 5—NON-MOTORIZED POLICY GUIDE	43
Pedestrian System Plan	11	Introduction	43
Bicycle System Plan	13	Federal Policy	43
Non-Motorized Funding Needs	13	Local Agency Actions	43
Chapter 9 – Recommended Measures to Implement the NMTP	15	Washington State Policy	44
CHAPTER 2—PEDESTRIAN SYSTEM INVENTORY & SELF-EVALUATION	17	Washington State Bicycle Facilities and Pedestrians Walkways	
Process	17	Plan March 2008-2027	46
GPS-Based Data Collection	17	Greenhouse Gas Emissions Reduction – Emerging Washington	
Field Application	18	State Policy	47
Data Summary	19	How does the Lakewood NMTP Integrate Emerging Statewide	
Missing Sidewalks	22	Policy on Greenhouse Gas Emission Reduction?	48
Curb Ramps	24	Mode-Share Policy Targets	49
Attribute Index	26	Lakewood Comprehensive Plan – Policy Supplement	51
Summary	27	Lakewood Pedestrian Plan Policy Framework	51
CHAPTER 3—METHODOLOGY FOR PRIORITIZING PEDESTRIAN NEEDS	29	Goal, Objectives, and Policies	51
Pedestrian Priority Index	29	Pedestrian Implementation Strategies	53
Attributes	29	Lakewood Bicycle Plan Policy Framework	55
Accessibility	29	Goal, Objectives, and Policies	55
Defining the Accessibility Indices	29	Bicycle Implementation Strategies	57
Planning-Level Costs Estimates	34	Bicycle and Pedestrian Facilities Funding Opportunities	57
Identifying Pedestrian Improvement Needs and Their Priorities	34	General Bicycle and Pedestrian Related Grants	58
GIS Database Applications	34	Safety Related Grants	58
Pedestrian Improvement Needs for Full ADA Compliance	34	CHAPTER 6—LOCAL NON-MOTORIZED DESIGN GUIDE	59
High Priority Pedestrian Improvement Needs	35	Introduction	59
Using the Pedestrian Priority Index	37	Pedestrian System	59
		Bicycle System	59
		Pedestrian Design Guide	59
		Sidewalk Corridor	60
		Driveway Crossings	63
		Curb Ramps	64

Pedestrian Crossings	68	NMTP Database Maintenance	96
Transit Stops	70	Site Plan Review	96
Other Pedestrian Design Features	70	WSDOT Coordination	96
Optional Sidewalk Designs On Local Streets In Established Neighborhoods	72	Sidewalk and Bicycle Design Standards	96
Bicycle Design Guide	73	Temporary Access in Work Zones	97
Bike Lanes	73	Removing Obstacles	97
Bike Lane Symbols and Markings	73	Transit Station and Stop Coordination	97
Shared-Lane Symbols and Markings	73	Neighborhood Traffic Management	98
Bicycle Route Signing	74	Walk-to-School Route Planning and Bicycle Education	98
Shared-Use Path Standards	75	Funding	98
Re-Striping Arterials with Bike Lanes	75	Other Funding Options	101
Summary	76	Next Steps	101
CHAPTER 7—WAYFINDING GUIDE	79	Summary	102
Introduction	79		
Purpose of Wayfinding	79		
Bicycle Wayfinding	79		
National Best Practices	80		
Pedestrian Wayfinding	80		
CHAPTER 8—PEDESTRIAN AND BICYCLE SYSTEM PLANS	81		
Introduction	81		
Pedestrian System Plan	81		
New Sidewalks and Shared-Use Paths	81		
Sidewalk Repairs	83		
New Curb Ramps and Curb Ramp Replacement	83		
Funding Needs for Pedestrian Improvements	83		
WSDOT Coordination	85		
Bicycle System Plan	86		
New Bike Lanes	86		
Shared-Lane Routes	88		
Shared-Use Path Connections	88		
Routes for Special Study	88		
Sound Transit Coordination	91		
Funding Needs for Bicycle System Pedestrian Improvements	91		
Non-Motorized Funding Needs	94		
CHAPTER 9—RECOMMENDED MEASURES TO IMPLEMENT			
NMTP	95		
Summary	95		
ADA Coordinator	95		
ADA Policy Coordination	95		
Project Programming, Coordination and Development	95		

Figures

Figure 1-1.	Existing and Missing Sidewalks and Curb Ramps...	3
Figure 1-2.	Composite Pedestrian Accessibility Index	5
Figure 1-3.	Pedestrian System Priorities	7
Figure 1-4.	Bikeway Facility Definitions	8
Figure 1-5.	Existing Bicycle System	9
Figure 1-6.	Pedestrian System Plan	12
Figure 1-7.	Bicycle System Plan	14
Figure 2-1.	Lakewood Sidewalks by Miles	19
Figure 2-2.	Lakewood Sidewalks by Functional Classification	20
Figure 2-3.	Sidewalk Condition (miles) by Street Classification	20
Figure 2-4.	Sidewalk Width (miles) by Street Classification	21
Figure 2-5.	Sidewalk Heave & Cracking (miles)	21
Figure 2-6.	Examples of Driveway Crossing Treatments	22
Figure 2-7.	Inventory of Existing and Missing Sidewalks and Curb Ramps	23
Figure 2-8.	Curb Ramp Type	24
Figure 2-9.	Curb Ramp Width	25
Figure 2-10.	Curb Ramp—Top Landing	25
Figure 3-1.	Composite Pedestrian Accessibility Index	33
Figure 3-2.	High Priority Pedestrian Needs	36
Figure 4-1.	Bikeway Facility Definitions	39
Figure 4-2.	Existing (2007) Bicycle Facilities	42
Figure 5-1.	Greenhouse Gas Savings – Washington State Policy Options	48
Figure 5-2.	Lakewood Worker Commute Mode-Share	49
Figure 6-1.	Lakewood Street Design Standard— Minor Arterial	60

Figure 6-2.	Pedestrian Zone System.....	61
Figure 6-3.	Sidewalk Grade Impact.....	63
Figure 6-4.	Driveway Crossing Types	64
Figure 6-5.	Types of Curb Ramp Designs	64
Figure 6-6.	Curb Ramp Types and Components	67
Figure 6-7.	Curb Ramp Landings Are Critical	68
Figure 6-8.	Design Speed and Corner Radii Affect Pedestrian Features.....	69
Figure 6-9.	Lakewood Current Local Street Design Standard.....	72
Figure 6-10.	Seattle's SEA Street Design Option.....	72
Figure 6-11.	Pros and Cons of Seattle SEA Streets	73
Figure 6-12.	MUTCD Standard Bike Lane Symbols.....	73
Figure 6-13.	"Sharrow" Symbol and Pavement Marking	74
Figure 6-14.	Example of Auxiliary Bike Signs	74
Figure 6-15.	Example Cross Section of Two-Way Shared Use Path on Separate Right-of-Way	75
Figure 6-16.	Bike Box Example.....	76
Figure 8-1.	Pedestrian System Plan.....	82
Figure 8-2.	Bicycle System Plan.....	87
Figure 8-3.	Gravelly Lake Share-Use Path Options	90
Figure 8-4.	Souder Station Area Access Needs.....	92

Tables

Table 1-1.	Lakewood Comprehensive Plan, Non-Motorized Goal and Policies	1
Table 1-2.	Pedestrian Improvement Costs (2007 dollars, in millions)	6
Table 1-3.	Priority Non-Motorized Plan Costs.....	13
Table 2-1.	GPS Data Inventory	18
Table 2-2.	Attribute Index	26
Table 3-1.	Pedestrian Priority Index Ratings, Point Values and Numeric Scores.....	30
Table 3-2.	Planning-Level Unit Costs.....	34
Table 3-3.	Pedestrian Improvement Costs (2007 dollars, in millions - rounded).....	34
Table 3-4.	Accessibility Index Thresholds (Project Prioritization).....	35
Table 5-1.	City of Lakewood NMTP – Implementing the Washington State Bicycle Facilities and Pedestrian Plan.....	47

Table 5-2.	City of Lakewood NMTP – Implementing the Emerging State Greenhouse Gas Policies	50
Table 6-1.	Sidewalk Corridor Zone.....	61
Table 6-2.	Sidewalk Width Regulations.....	62
Table 6-3.	Sidewalk Grade Regulations.....	63
Table 6-4.	Curb Ramp Design Best Practices	66
Table 8-1.	Priority Pedestrian System Projects.....	84
Table 8-2.	Priority Bicycle System Projects	93
Table 8-3.	Priority Non-Motorized Plan Costs.....	94
Table A-1:	ADA Self-Evaluation – Curb Ramp Summary.....	A-23
Table A-2:	Pedestrian Corridor Barrier Removal Schedule..	A-24

Appendices

Appendix A – Pedestrian System Inventory and ADA Transition Plan
Appendix B – Steering Committee Pedestrian Priority Rankings
Appendix C – Walk To School Route Mapping Examples
Appendix D – Pierce Transit Bus Stop Standards
Appendix E – Tacoma-Pierce County Board of Health / Complete Streets Policy



Non-Motorized Transportation Plan



Chapter 1—Executive Summary

Introduction

Lakewood's Non-Motorized Transportation Plan (NMTP) is intended to provide a comprehensive plan to enhance the Lakewood urban area pedestrian and bicycle system. This effort was initiated by the City of Lakewood to address the goal and policies contained in its comprehensive plan for non-motorized travel as summarized in **Table 1-1:**

Table 1-1. Lakewood Comprehensive Plan, Non-Motorized Goal and Policies

Goal:	Provide safe, convenient, inviting routes for bicyclists and pedestrians
Policies	
T-14.1	Identify key routes serving high density areas or major destinations to serve bicyclists and pedestrians.
T-14.2	Identify disconnected streets that can be retrofitted with bike and pedestrian connectivity.
T-14.3	Balance the desirability of breaking up large blocks with mid-block crossings with pedestrian safety needs.
T-14.4	Require the incorporation of non-motorized facilities including bike parking, pedestrian-scale lighting, benches and trash receptacles into new development designs.
T-14.5	Work with transit providers to provide bike racks and/or lockers at key transit stops and require them as condition of new development.
T-14.6	Coordinate with adjacent jurisdictions to design for coherent bike and pedestrian corridors.
T-14.7	Develop a non-motorized transportation plan for the city that would guide Lakewood in establishing bicycle and pedestrian facilities. The plan should establish policies and implementation strategies and suggest preferred design and maintenance standards to best provide for user safety.

The primary emphasis of the NMTP is to identify critical gaps in the City's pedestrian and bicycle transportation system and possible projects to help fill those gaps.

The Lakewood NMTP was completed in several steps. First, an inventory of the existing pedestrian and bicycle system within the City of Lakewood was completed and integrated into the City's Geographic Information System (GIS). The GIS data were used to conduct spatial analyses and identify priority pedestrian and bicycle improvements. Planning-level cost estimates were integrated into the spatial analyses and used to help draft priority improvement projects while considering accessibility to public transit, schools, parks, civic centers and other critical factors.



Missing Sidewalks on 108th St

A Steering Committee was formed by the City to help guide development of the NMTP. Through a series of three meetings the Steering Committee reviewed the non-motorized system inventory and various accessibility measures and helped identify Lakewood's local priorities for pedestrian and bicycle system improvements. The Final NMTP reflects the Committee's input and recommendations.

Another objective of the Lakewood NMTP included a pedestrian planning process to address the guidelines and regulatory requirements of the Americans with Disabilities Act (ADA). The ADA was enacted on July 26, 1990, and provides comprehensive civil rights protections to persons with disabilities in the areas of employment, state and local government services, and access to public accommodations, transportation, and telecommunications. There are five titles or parts to the ADA; Title II is of the most concern to the NMTP. Lakewood's NMTP is intended to address the most recent ADA policies and rules (see Appendix A – Lakewood Transition Plan).

Commensurate with the ADA requirements for inventory and self-evaluation, the City targeted a significant portion of the overall NMTP planning effort to complete a walking inventory of the major street-side pedestrian system within the Lakewood urban area.

Approximately 280 miles of existing and missing sidewalks and 1,280 street corners (curb ramps) were inventoried and assessed as part of Lakewood's Self-Evaluation. Documenting the location, type and condition of sidewalks and curb ramps is an important step in the pedestrian planning effort. A full inventory of missing sidewalks helps identify the critical "gaps" to fill. Lakewood has successfully completed a thorough inventory of the pedestrian system as the basis of the NMTP.

The NMTP also included a summary of the existing bicycle system, including bicycle lanes, shared-use paths and shared travel lane facilities. The summary was documented to help identify candidate corridors for bicycle lane and route enhancements. The NMTP



Missing Sidewalks on 111th St

provides Lakewood with the added background summary, assessment and general recommendations for bicycle corridor enhancements to fill in critical bicycle system gaps. Through recommended implementation, Lakewood can effectively expand the bicycle system along critical corridors to better link major areas of the city, especially between downtown and various Lakewood neighborhoods. Through continued coordination and implementation of the NMTP, Lakewood, its neighboring cities and Pierce County can effectively expand and enhance the regional pedestrian and bicycle network.

Lakewood's NMTP contains a summary evaluation of the existing pedestrian and bicycle facilities; and provides comprehensive

recommendations for future facilities. Key components of the NMTP include:

- An inventory and condition assessment of existing sidewalks & curb ramps along major streets in the Lakewood urban area
- A methodology for prioritizing pedestrian projects
- An inventory of the bikeway system
- A non-motorized Policy Guide and Local Design Guide for pedestrian and bicycle facilities, including recommended changes to existing City design standards
- A prioritized summary of pedestrian and bicycle plan projects and their costs
- Recommended measures to implement the NMTP

A brief summary of each chapter in the Lakewood NMTP is provided here.

Chapter 2 – Pedestrian System Inventory and Self-Evaluation

In the summer of 2007, data collection using hand-held Global Positioning System (GPS) units was conducted to fully inventory the pedestrian facilities along Lakewood's major streets within the urban area. As shown in **Figure 1-1**, the result of the inventory is a map and database of existing and missing sidewalks and curb ramps. The inventory database was formatted specifically for GIS analysis and was added to the City's other GIS-based mapping themes for interim analysis and evaluation.

Slightly more than 80 percent of Lakewood's streets are missing sidewalks. There are over 54 miles of sidewalks within the Lakewood urban area. Only about 18 percent of the sidewalks have some form of a buffer that separates sidewalks from the street and curb section.

Arterial and collector street sidewalks constitute about 36 percent and 41 percent, respectively, of Lakewood's total sidewalk mileage. Local street sidewalks constitute about 22 percent of the total sidewalk mileage within the Lakewood urban area.

Figure 1-1
Existing/Missing Sidewalks & Curb Ramp Deficiencies

Legend

- Missing Curb Ramp
- Perpendicular & Missing Top Landing
- Curb Ramp < 36 Inches
- Existing Sidewalk
- Missing Sidewalks
- Interstate
- Arterial
- Collector/Local
- Lake
- Park
- City Limit

City of Lakewood Non Motorized Transportation Plan

As shown in Figure 1-1, there are only a few miles of sidewalks on non-local streets that may need to be replaced due to poor surface conditions. It was found that the older developed areas have a larger portion of older sidewalks needing repair or new sidewalks where they are currently missing. In some cases these areas were developed prior to the current sidewalk design standards and/or site development standards that required sidewalks to be built on both sides of the street. Older Lakewood neighborhoods are the subject area with a larger number of missing sidewalks and sidewalks in poor condition.

Chapter 3 – Methodology for Prioritizing Pedestrian Projects

Future pedestrian improvements in the City should be prioritized so the City of Lakewood can effectively implement the NMTP recommendations. The prioritization method must consider the relative cost of needed pedestrian improvements to maximize the public's investment within Lakewood areas that require higher levels of pedestrian accessibility. The City of Lakewood's Pedestrian Priority Index (PPI) was based on separate index measures for "attributes" and "accessibility."

Attributes

The summary and evaluation of existing sidewalks and curb ramps identified for each pedestrian attribute is given a condition rating, ranging from very poor to good or excellent (see Chapter 2 – Pedestrian System Inventory and Self-Evaluation). The current pedestrian system attributes in the poorest condition (or missing) were scored highest in the Attribute Index as the segments in greatest need for improvement.

Accessibility

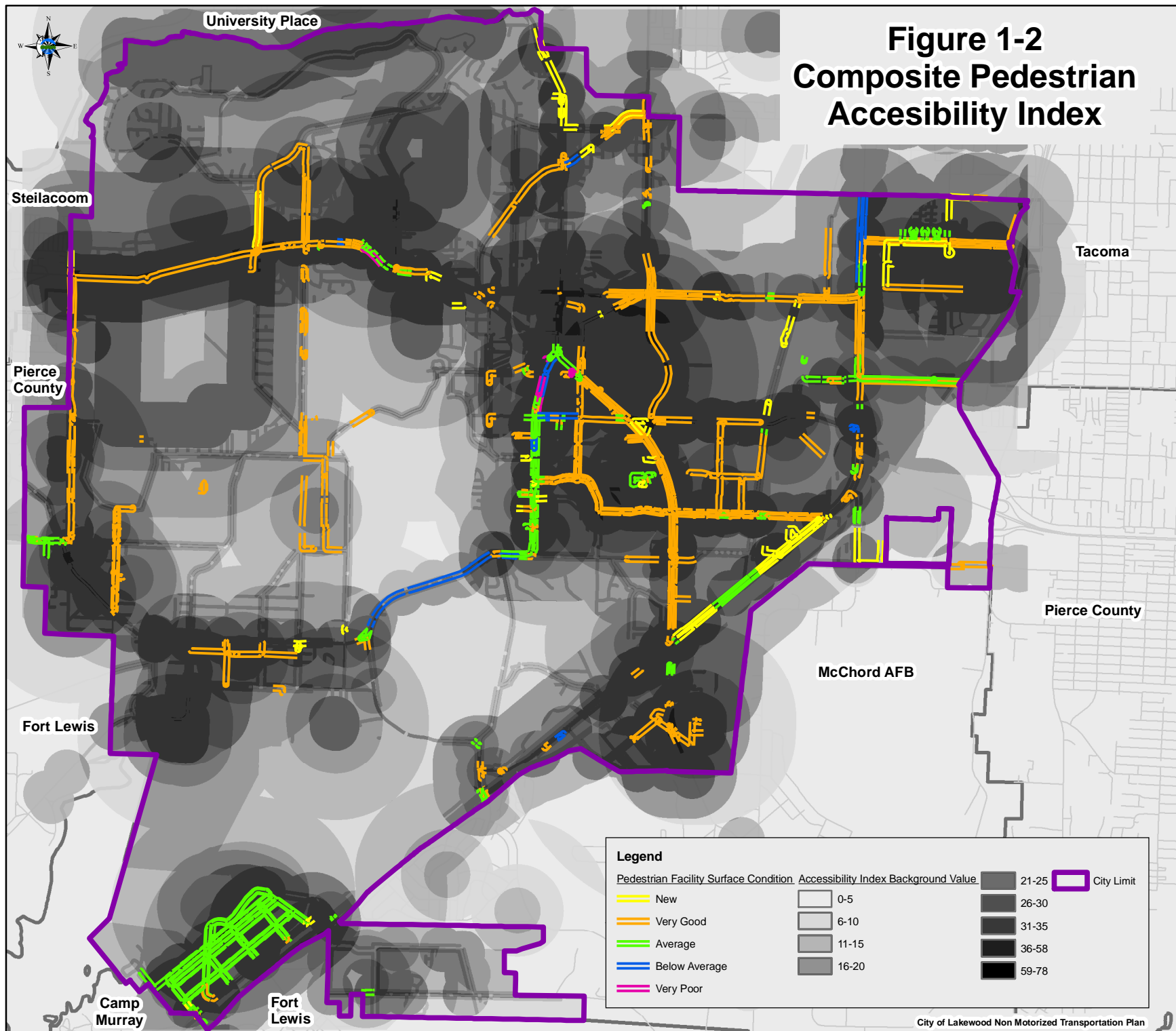
The closer that needed pedestrian improvements projects are located to various important trip generators and transportation

facilities, the higher their priority. A series of critical accessibility indices are grouped into a composite Accessibility Index to help prioritize improvements. Point scoring was established for each index. Accessibility indices were established by measuring and scoring the proximity of existing and missing sidewalk segments near:

- Schools (by school type, walk-to-school routes)
- Civic/ Commercial Centers
- Parks
- Transit (routes and bus stops)
- Traffic signals (street crossing access)
- Street Functional Classification (type and level of auto/truck traffic conflict)
- Lower Income Residence
- Mobility-Impaired Residence
- Population/Employment Density
- Senior/Adult Housing
- Walk-To-Work (US Census of areas with high walk-to-work mode split)

The accessibility measures were coordinated and ranked by the Lakewood NMTP Steering Committee. To reflect the community's priority, slightly higher emphasis was placed on accessibility improvements near schools or along walk-to-school routes, near parks, near local business and civic centers, and near transit facilities.

The composite accessibility index map is illustrated in **Figure 1-2**. As shown, areas in darker shading reflect higher pedestrian accessibility index values. Also illustrated in **Figure 1-2**, as example, are arterial and collector streets with ratings for sidewalk surface condition. Those "poor" sidewalks within the darkest shaded areas are ranked (in combination with ratings for other pedestrian features) the highest in priority for future improvements. These values and scoring system form the basic input into the prioritization of pedestrian system improvement needs.



Planning-Level Cost Estimates

A set of planning-level unit cost measures were prepared within the study to help estimate the cost of future pedestrian improvements. These costs are not necessarily reflective of actual costs, but provide a comparative basis for establishing priorities and evaluating future programs. All possible pedestrian system improvements were assigned a planning-level cost estimate.

Those potential sidewalk or curb ramp improvements with the highest Composite PPI score should have the highest priority for future project completion. The Composite PPI was applied to all sidewalk segments and curb ramp locations, including missing sidewalk segments and missing curb ramps. Three priority levels were assigned to all possible pedestrian improvements.

The cost to build new and improved sidewalks and curb ramps fully compliant with the ADA throughout the entire Lakewood urban area is estimated at about \$174 million. **Table 1-2** summarizes these pedestrian improvement cost estimates by priority and improvement type. Not all pedestrian improvements are essential for system pedestrian mobility and access.

Table 1-2. Pedestrian Improvement Costs (2007 dollars, in millions)

Pedestrian Improvements	Priority			TOTAL
	High	Medium	Low	
New Sidewalk	\$32.1	\$67.9	\$62.7	\$164.0
Sidewalk Repairs	\$0.2	\$3.2	\$0.9	\$4.3
New Curb Ramps	\$0.4	\$2.2	345	\$2.8
Curb Ramp Repairs	\$0.7	\$0.5	\$1.2	\$2.9
Total	\$33.4	\$73.8	\$64.8	\$174.0

The cost of constructing new sidewalks is the largest of all improvement costs, and the greatest portion of these costs is

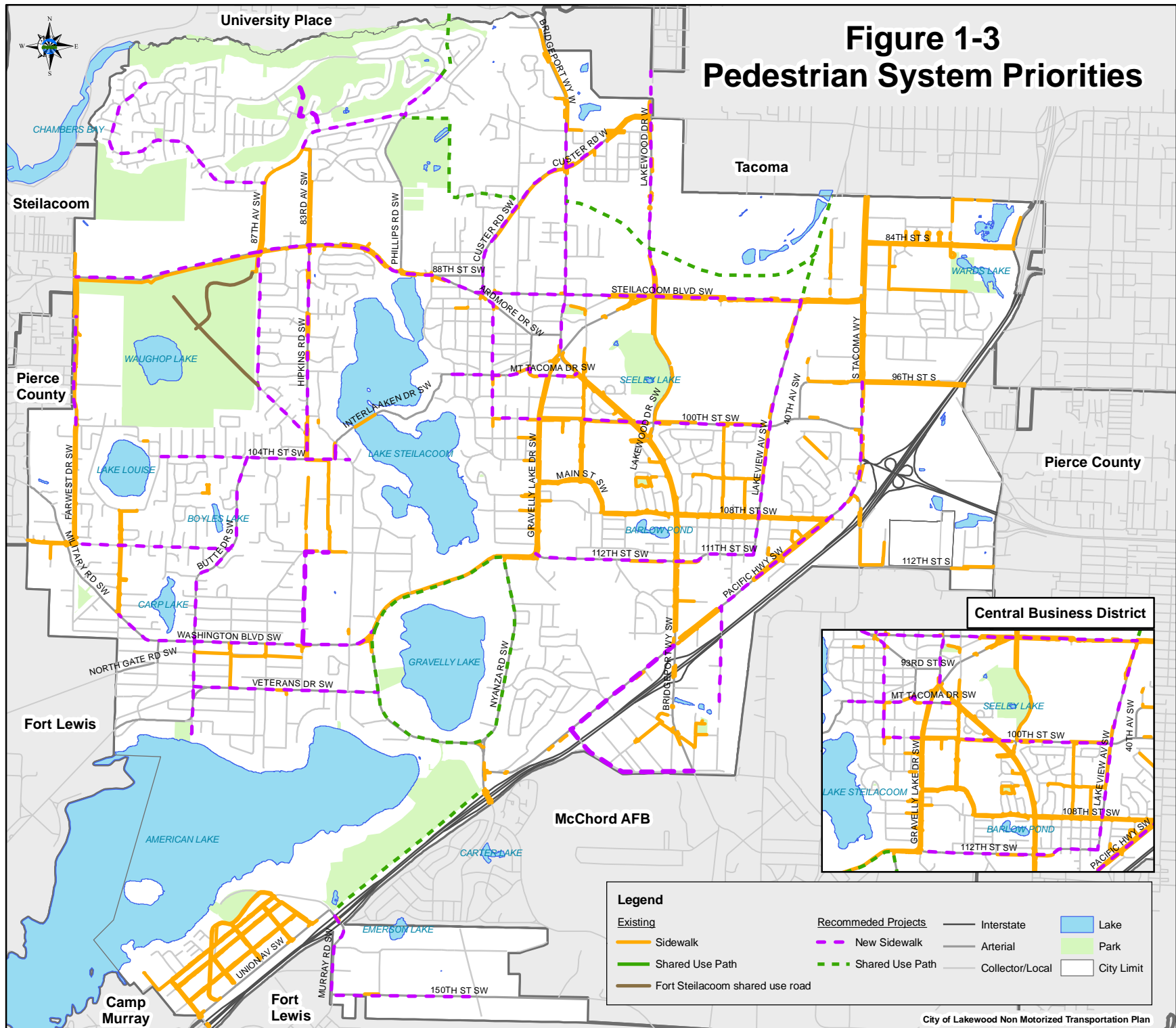
amongst the “medium” and “low” priorities. Low priority, new sidewalk improvement needs are essentially in areas outside many or all of the accessibility measures calculated as part of the study. The high (\$33.4 million) priority pedestrian improvements are the focus of the study. These improvements are located in areas where pedestrian activity is highest (e.g. near schools and transit stops, or near dense population and employment centers) and needed accessibility improvements are greatest (e.g. along or across busy arterials or near civic buildings).

As illustrated in **Figure 1-3**, the high priority pedestrian improvement includes proposed sidewalks and shared-use path connections. High-priority new sidewalk improvement costs are largely located along various arterial and collector streets and within the downtown area.



Pedestrian Crossing on 96th Street

Figure 1-3 Pedestrian System Priorities



Chapter 4 – Existing Bicycle System

Two fundamental building blocks are needed in understanding the study of Lakewood's bicycle system: (1) a baseline definition of the various terms and language used in describing bicycle facilities, and (2) acknowledging the physical constraints which have limited Lakewood's bicycle system development.

Historical plan documentation includes text and mapping reference to "Bikeway" or "Bikeway Route" network definitions, some of which may be implied to mean on-street bicycle lanes. What are bikeway routes? Are they separate lanes for cyclists or a series of signs and painted symbols that indicate for both motorists and cyclists the need to share the outside travel lane? There is need for further clarity in these definitions, otherwise planners, engineers, policy officials and the general public might be unclear what the NMTP full intentions are. **Figure 1-4** illustrates the basic forms of bikeway facilities that the City of Lakewood should adhere to concerning bicycle facilities.

The City of Lakewood urban area surrounds several lakes and spans I-5 in three separate pockets of residential and mixed-use centers. The Lakewood area street network was also historically designed for cars and trucks, as many routes lack sidewalks, and in many cases arterial streets lack bike lanes. Typically, there is a thin shoulder that many cyclists use today as a de facto bike lane. As a result, while the Lakewood area has many attractive features, the bicycle system is lacking a cohesive and connected network. **Figure 1-5** illustrates the existing bicycle system in Lakewood.

Figure 1-4. Bikeway Facility Definitions

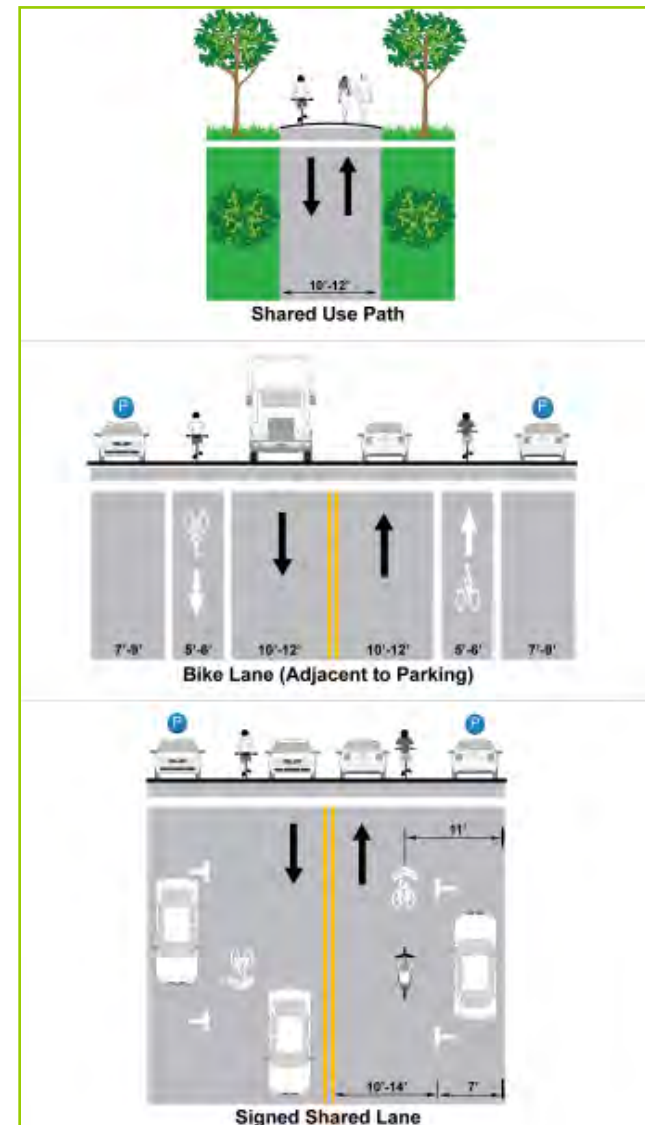
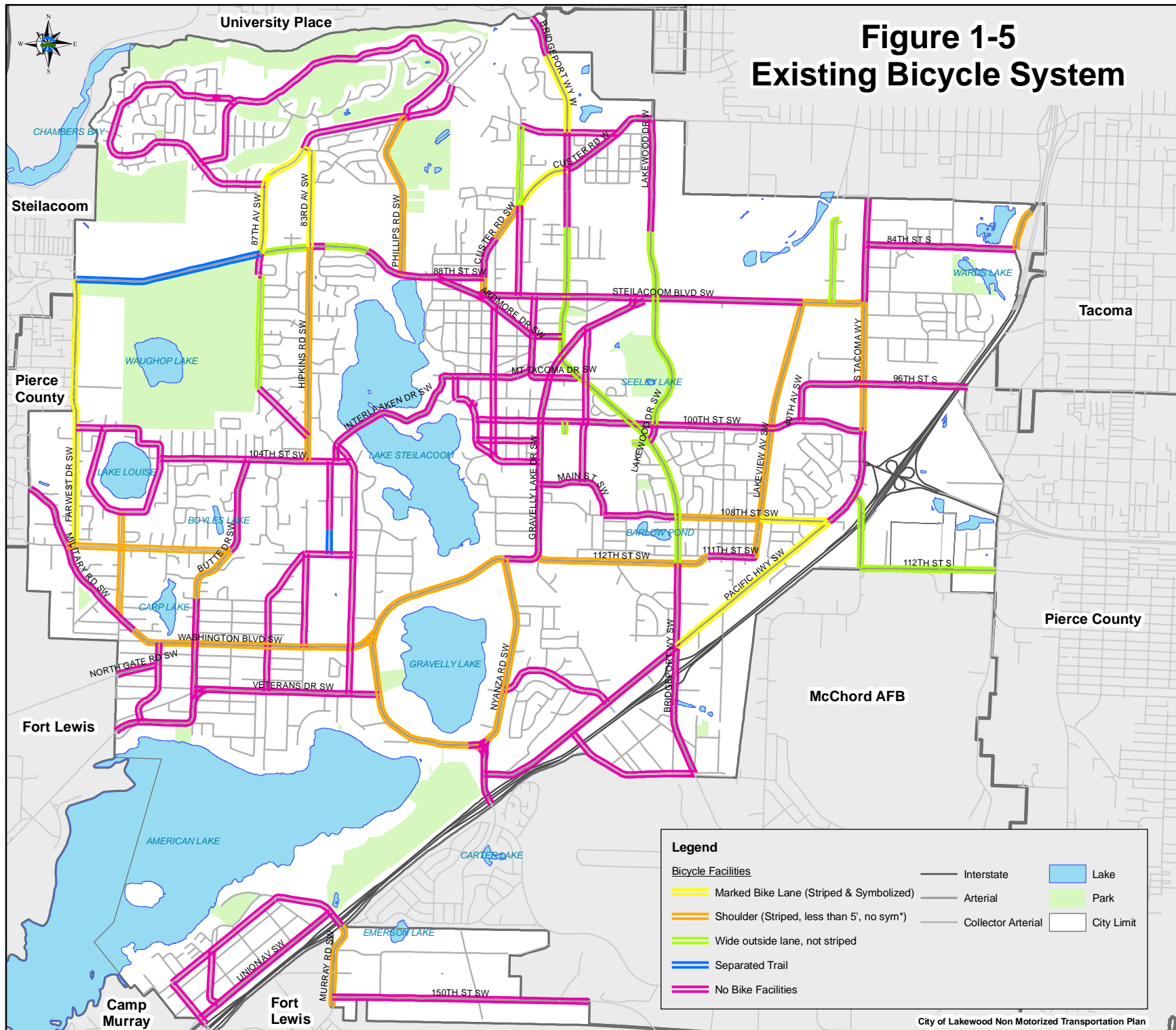


Figure 1-5 Existing Bicycle System



Chapter 5 – Non-Motorized Policy Guide

There are several federal and state policies which affect the City of Lakewood regarding the planning and development of its non-motorized transportation system. This chapter provides an overview of those policies, and summarizes a policy framework for both the pedestrian and bicycle element of the NMTP. The policy framework outlines the pedestrian and bicycle goals, and then a series of objectives, policies and implementation strategies by which the City can coordinate and guide the implementation of NMTP as an integral component of the Lakewood comprehensive plan. The policy guide concludes with a summary of state funding sources for non-motorized projects.

The U.S. Department of Transportation (USDOT) has issued policy guidelines for public agencies to better integrate bicycling and walking into comprehensive transportation plans. Much of Washington State policy regarding transportation planning is guided by the Growth Management Act (GMA). In 2005 the State amended the GMA to encourage local governments to complete their non-motorized transportation plans with comprehensive networks for pedestrian and bicycle travel. Specifically, the GMA amendments require communities to consider urban planning approaches that promote physical activity and require that a bicycle and pedestrian component be included in the transportation element of comprehensive plans. Fundamental to state policy is support for local plans which help ensure that high quality bicycle and pedestrian facilities are available, as well as ensuring that people feel safe using them. “High quality” plans have several characteristics:

- A complete street network with multiple connections, accommodating of multiple transportation modes.
- Connectivity between trails, pathways, neighborhoods, schools, and sidewalks that enhances the ability for users to be physically active.
- Trails and linear parks that link activity centers, and serve as recreation facilities and as transportation routes.

- Safety enhancements such as lighting, signage, more safe crossing opportunities, reduced vehicle speeds, and separated paths and trails.

By addressing these federal and state policies the City of Lakewood will be competitive for statewide and federal funding, and consistent with the revised GMA.

Chapter 6 – Local Non-Motorized Design Guide

There are many opportunities to improve pedestrian and bicycle conditions and in doing so making Lakewood more livable. The purpose of the Local Non-Motorized Design Guide is to highlight significant local design features relative to federal and state requirements and design guides on the premise that accessible design is the foundation for all good pedestrian and bicycle design.

The Local Non-Motorized Design Guide directly references **Designing Sidewalks and Trails for Access⁵** for the full range of pedestrian design elements, rather than develop a fully independent and comprehensive guide. Detailed sidewalk, curb ramp, driveway crossing and trail design elements are provided in Designing Sidewalks and Trails for Access. The Local Non-Motorized Design Guide summarizes only those elements of the pedestrian system crucial to current planning, design and construction of critical pedestrian facilities in Lakewood.

Similar design guidance is important for the consistent development of Lakewood’s system of bicycle lanes and share-lane facilities. Significant guidance is provided at the federal and state level in assisting Lakewood in revisions for design guides to bicycle facilities, including:

- Guide for the Development of Bicycle Facilities, 1999, AASHTO.
- Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Division (including the Washington State Modifications to the MUTCD, M 24-01).

- WSDOT Design Manual, Bicycle Facilities—Section 1020, 2001.

The cities of Chicago and San Francisco have also pioneered bicycle design work from which Lakewood can borrow important elements, particularly with regards to bicycle lane and shared travel lane facilities. Areas where design guideline recommendations are made include:

- Curb ramps and sidewalks
- Shared-use path, bicycle lanes, and shared-use lane facilities, and
- Transit stops

Chapter 7 – Wayfinding Guide

The City of Lakewood's street system was developed around and between major geographic features and barriers, resulting in a pattern of multiple directions, angles and non-traditional intersections. Especially for recreation cyclists and walkers, the area's many destinations are difficult to reach while negotiating the street system. As the City implements and eventually completes its NMTP there will be more convenient routes for non-motorized travel. Cross-town travel could remain tricky, so a system of supplemental wayfinding signs can significantly enhance non-motorized travel within the Lakewood urban area and between its neighboring cities. Well-defined and placed wayfinding signs can better inform walkers and cyclists towards the appropriate routes and destinations.

Chapter 8 – Pedestrian and Bicycle System Plans

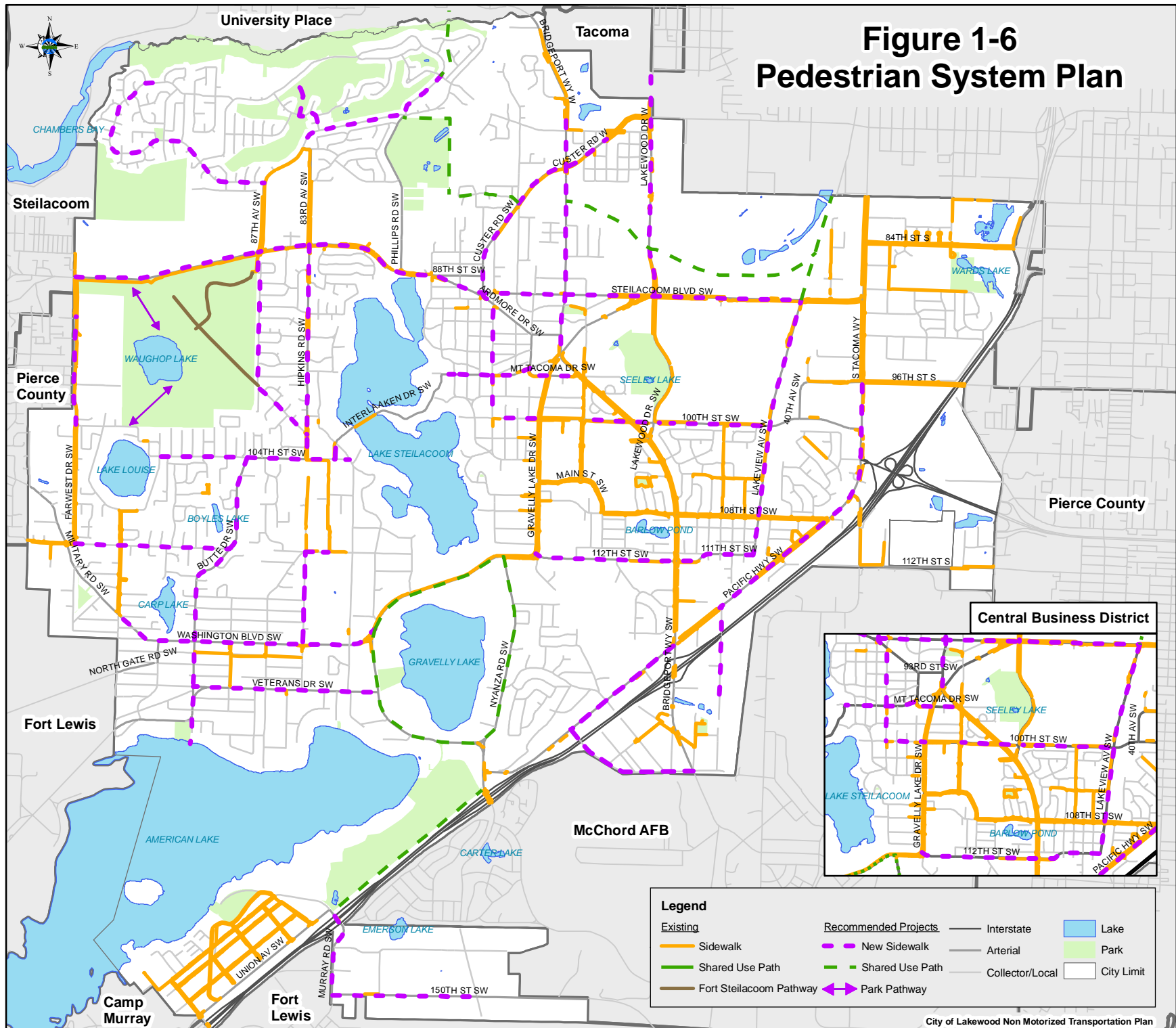
The NMTP Steering Committee was essential in helping establish priorities and in the review and general consensus of draft pedestrian and bicycle plan recommendations—mainly the respective pedestrian and bicycle system maps. These maps indicate the priority pedestrian and bicycle projects identified in the Lakewood urban area, generally to be constructed over the next 20 years.

Pedestrian System Plan

Chapter 3 summarized the process establishing the sidewalk and curb ramp improvement needs, resulting in a ranking of high, medium and low priorities. With the help of the Steering Committee, the high priority needs were further evaluated, defining logical pedestrian corridor projects that provided continuous linkages between major non-motorized trip generators or attractions, particularly those connections that link various neighborhoods with each other and downtown Lakewood. Together with existing pedestrian facilities, these refined priorities forms Lakewood's Pedestrian System Plan

Figure 1-6 summarizes the Lakewood Pedestrian System Plan. The Plan map includes new sidewalks that are likely to be constructed as part of future street improvements and other streets where new sidewalks should be added. In addition, the Plan includes recommendations for new shared-use path routes for use by pedestrians and cyclists.

Figure 1-6 Pedestrian System Plan



Bicycle System Plan

Priority was placed in the plan process to identify opportunities to re-stripe existing arterial and collector streets with bicycle lanes to close critical gaps in the existing system. As an alternative, along existing streets where space is limited (existing travel lanes and curb/sidewalks) or there are underlying design constraints bicycle lane re-striping was found to be impractical. As an alternative to bike lanes the plan recommends striping and posting these routes as shared lanes. Finally, a series of new shared-use path connections are identified in the plan, particularly around Gravelly Lake.

Figure 1-7 maps the existing and planned bicycle system for the Lakewood urban area. The bicycle system plan includes re-striping about 8 miles of bicycle lanes, 32 miles of shared-use lane routes, and over 7.0 miles of new shared-use paths to fill critical gaps in Lakewood's bicycle system.

Non-Motorized Funding Needs

The combined non-motorized system priority improvement costs are slightly less than \$37 million, as summarized in **Table 1-3**.

Table 1-3. Priority Non-Motorized Plan Costs

	Miles	Cost	Annual Cost (rounded)
New Sidewalks	18	\$25,855,000	
Sidewalk Repairs	5	\$973,000	
New / Replacement Curb Ramps		\$237,000	
Pedestrian Signal Push Buttons		\$264,000	
Bike Lane Signing and Marking	8	\$257,000	
Shared-Lane Signing / Marking	32	\$633,000	
New Shared-Use Path s	7.0	\$8,667,000	
Total		\$36,896,000	\$1,844,800

Clearly, the majority of these costs are attributable to high priority sidewalk improvements, and it remains uncertain as to whether some of these sidewalk improvements will be included within other arterial street projects in future updates to Lakewood's TIP.

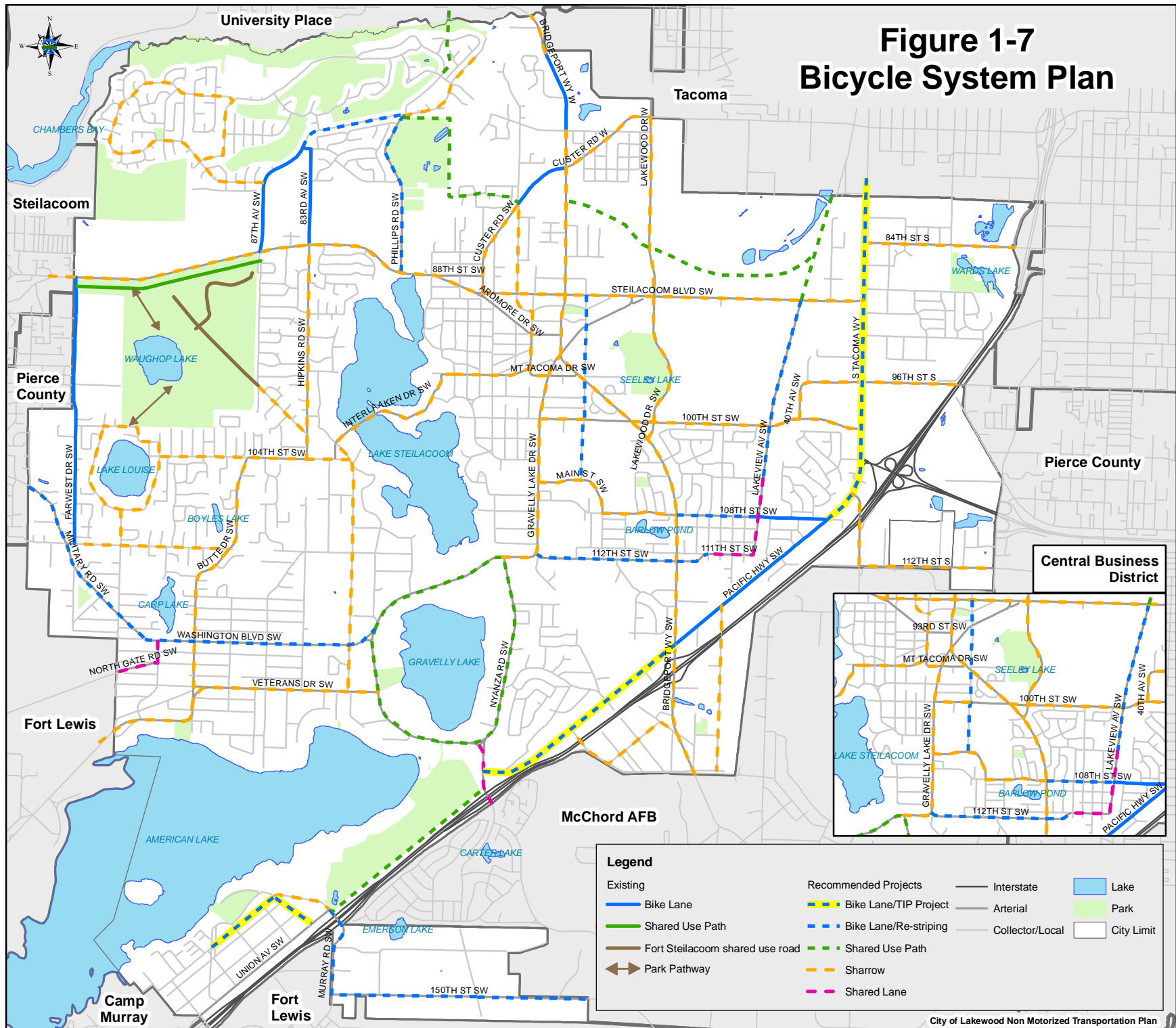
However, should the City decide to fund these non-motorized improvements over twenty years, the annual cost would be about \$1.8 million. This is a sizeable increase in non-motorized funding than what the City of Lakewood has undertaken in the past.

A preliminary funding assessment was conducted on the various pedestrian and bicycle improvement needs as input into the larger transportation funding question that Lakewood will examine as part of its Transportation Master Plan, at which time the NMTP findings can be revised and updated. It is generally anticipated that the 20-year NMTP priorities will not be funded unless an additional revenue program(s) is implemented.



Bike Lane on 108th Street

Figure 1-7 Bicycle System Plan



Chapter 9 – Recommended Measures to Implement the NMTP

The City of Lakewood serves a critical role in the planning, development and construction of needed pedestrian and bicycle improvements. That role will likely be expanded to meet the needs identified in the NMTP.

The NMTP recommends on-going refinement to project priorities, short- and long-range planning coordination, bus stop planning and design, refinement to design standards, and better site-plan review processes. Follow-up planning efforts



Missing Sidewalks on 112th Street

to focus on critical walk-to-school routes and a comprehensive neighborhood traffic management program are all important measures that help implement the findings and recommendations of the NMTP.

Recent public input indicates that Lakewood residents are seeking greater public investment in non-motorized facilities. Neighborhoods and interest groups are also focusing on street, bicycle and pedestrian traffic safety issues. As continued growth occurs in Lakewood, so too will traffic congestion. The public's interest in neighborhood traffic management issues will likely expand, and residents will likely be calling on the City for even greater assistance to help improve pedestrian, bicycle and neighborhood traffic conditions. It is also very likely that more detailed federal policies and ADA rules are forthcoming in the near future. These policies may require the City to expand its efforts to develop and refine internal policies and standards to guide pedestrian plans and projects.

In accordance with current ADA requirements, Lakewood is to have designated an ADA Coordinator to facilitate the ADA rules and coordinate with local stakeholders. To best administer the NMTP findings, Lakewood should consider revising staffing position responsibilities that couple the ADA and NMTP Coordinator functions, serving to guide and facilitate the implementation measures as outlined.

Recent public opinion research indicates that Lakewood residents regard safe walking routes a public priority, and value the public's investment in bicycle facilities, especially the shared-use path (trail) system. The City serves a critical role in the planning, development and construction of needed pedestrian and bicycle improvements. The NMTP will certainly elevate the City of Lakewood's public exposure as a designer and provider of street and non-motorized systems.



Recent Non-Motorized Improvements to Pacific Highway

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Non-Motorized Transportation Plan



Chapter 2—Pedestrian System Inventory & Self-Evaluation

Process

The City of Lakewood conducted extensive pre-planning as part of the NMTP to ensure the inventory of existing sidewalk and curb ramp facilities was both cost-effective and yielded highly accurate and reliable data for further analysis.

Title II of the American's with Disabilities Act (ADA) requires that the City of Lakewood evaluate its services, programs, policies, and practices to determine whether they are in compliance with the nondiscrimination requirements of the ADA. This section describes the data collection process and resulting inventory of sidewalk and curb ramp facilities within the Lakewood urban area, all critical elements as part of the City of Lakewood's Self-Evaluation. The inventory and self-evaluation is described in these sections.

GPS-Based Data Collection

Techniques and Technology

Rather than manually record the sidewalk and curb ramp system with laptop computers or hard-copy tablets, the City of Lakewood and The Transpo Group evaluated and confirmed the use of hand-held Global Positioning System (GPS) units to electronically record the necessary system inventory. The GPS data collection method enabled the City of Lakewood to eliminate the steps of hard data transcription, formatting and re-entry for later GIS analysis.

The use of Trimble GeoXT hand-held GPS units provided the City of Lakewood with the best hardware and software product to (1) quickly develop and deploy a detailed data collection routine that addresses critical system components, (2) record field data with very high geo-positioning accuracy, and (3) quickly learn and adapt the City of Lakewood's data collection capabilities for a variety of needs.

The GeoXT's units were equipped with Terrasync software for maximum data collection capacity and geospatial GPS accuracy. The Pathfinder Office software provided The City of Lakewood the ability to efficiently develop the sidewalk/curb ramp inventory template, called a "Data Dictionary," accurately transfer files between desktop computers and the GeoXT units, and accurately correct raw data for higher GPS accuracy – a process known as differential correction. Once the field data was transferred and geo-corrected, Pathfinder Office also provided routines to convert the raw data into geographic information system (GIS) data files. The sidewalk/curb ramp GIS data was assimilated with other GIS data in the City's GIS program. The Transpo Group used the GIS data inventory for later geo-spatial and planning priority analysis (see Chapter 3 – Methodology for Prioritizing Pedestrian Projects).



GPS Unit

Data Dictionary Development

The Transpo Group developed and tested the Data Dictionary file for use with the Trimble GeoXT's to record the necessary sidewalk and curb ramp information. The Data Dictionary was developed to collect pertinent information to identify the location and characteristics of sidewalk and curb ramp features, focusing on ADA-compliance (see ADAAG) based on characteristics fully defined and summarized in Designing Sidewalks and Trails for Access. GPS data line features were used to record the location of missing sidewalks and the characteristics of existing sidewalks. GPS point features were used to record the location of missing curb ramps and the characteristics of existing curb ramps. The Data Dictionary was also developed with pre-set scoring values for all sidewalk and curb ramp attributes. These pre-set values helped expedite the GIS evaluation in later steps of the study. Table 2-1 summarizes the characteristics targeted in the inventory. **Appendix A** includes a full summary of the sidewalk

and curb ramp features and attributes that were defined in the Data Dictionary for GPS data collection.

Field Application

Staff Training

City of Lakewood staff conducted the walking inventory with the GPS equipment, including orientation and training of staff. The orientation training included work sessions that fully defined the study purpose and specific sidewalk and curb ramp characteristics to be inventoried. The training also included demonstration of the use of the GeoXT GPS units and application of the Data Dictionary to measure and record specific sidewalk and curb ramp characteristics.

Data Collection

Staff was equipped with the GeoXT unit, tape measure (to measure sidewalk and curb ramp dimensions), and a Smart Level to efficiently and accurately measure sidewalk and curb ramp slopes. The staff was also equipped with an orange reflector vest, hat and phone for safety.

For block sections, the predominant sidewalk characteristic was recorded for the entire block length (although the width and length of severely damaged sidewalks sections were recorded to more accurately estimate replacement costs). For curb ramps, unique and specific curb ramp (or missing curb ramp) characteristics were recorded for each public street corner.

Over 54 miles of existing sidewalks were inventoried, and 225 miles of missing sidewalks were logged.

Slightly more than 1,280 street corners were inventoried for the presence and characteristics of existing curb ramps.

Table 2-1. GPS Data Inventory

Feature	Characteristics
Sidewalks	Location, width, cross-slope, material, surface condition, presence of heaving/cracking, type and number of fixed obstacles within sidewalk, type and number of movable obstacles located on sidewalk, presence of vertical obstructions, type of street lighting, type and number of driveway crossings, presence and type of buffer between street and sidewalk, presence and type of foliage (trees, shrubs, grasses, etc.), type of street curb
Missing Sidewalks	Location, type and number of fixed obstacles in immediate area of future sidewalk, type of street curb (if any)
Curb Ramps	Location, type, surface condition, material, top landing width and slope, number of ramps at corner, ramp width, ramp slope, ramp cross-slope, slip-resistant surface, sidewalk approach, ramp flare slope, gutter slope, crosswalk connection and alignment, bottom landing width and slope
Missing Curb Ramps	Location, sidewalk surface condition, material, type and number of fixed obstacles in immediate area of future curb ramp, location of nearby street drain
Pedestrian Buttons	At traffic signal by signal type, location, type, placement height and orientation, and audible signal device (yes/no)

Over 256 pedestrian push buttons were inventoried at intersections or street crossings equipped with a traffic signal device. Data collected include pedestrian button placement (distance from crossing), placement and orientation, whether equipped with audible signal device and type of traffic signal.

Quality Control

Pre-planning for the inventory effort included the identification of regular quality control and evaluation of the GPS raw data. Initial review of the raw GPS data was provided by The Transpo Group. City Staff conducted weekly GPS data conversion, differential corrections, GIS data conversion and database assembly. Any data discrepancies or errors, including missing data, were identified and coordinated with staff to re-inventory problem areas. Only a few streets or areas required secondary data collection efforts to replace questionable or missing data.

Data Post-Processing and GIS Data Conversion

City Staff conducted post-processing of the raw data on a weekly basis. By use of Pathfinder Office, the raw data was differentially corrected for more accurate data positioning. Differential corrections involves correlating the raw data geo-reference or position measurements (longitude-latitude and elevation) recorded by the GeoXT GPS units. The refined data was then converted to GIS format. A GIS database of the sidewalk and curb ramp inventory was developed based on the GPS data inventory records.

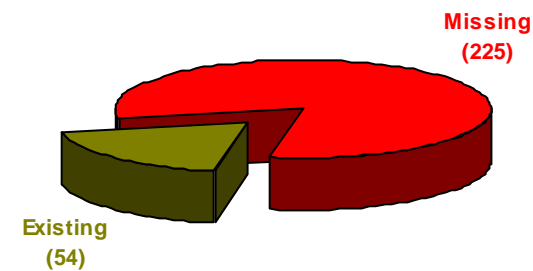
Data Summary

Sidewalks

Existing vs. Missing Sidewalks

As summarized in **Figure 2-1**, slightly more than 80 percent of the study area streets are missing sidewalks. There are over 54 miles of sidewalks within the Lakewood urban area. Only about 18 percent of the sidewalks have some form of a buffer that separates sidewalks from the street and curb section (see also Appendix A, Figure A-1).

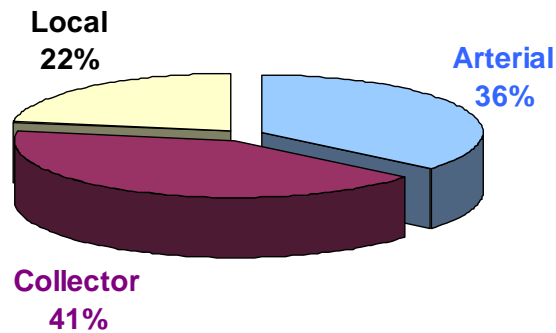
Figure 2-1. Lakewood Sidewalks by Miles



Sidewalk By Street Class

Arterial and collector street sidewalks constitute about 36 percent and 41 percent, respectively, of Lakewood's total sidewalk mileage. Local street sidewalks constitute about 22 percent of the total sidewalk mileage within the Lakewood urban area. **Figure 2-2** shows the distribution of the City's sidewalks by street functional classification.

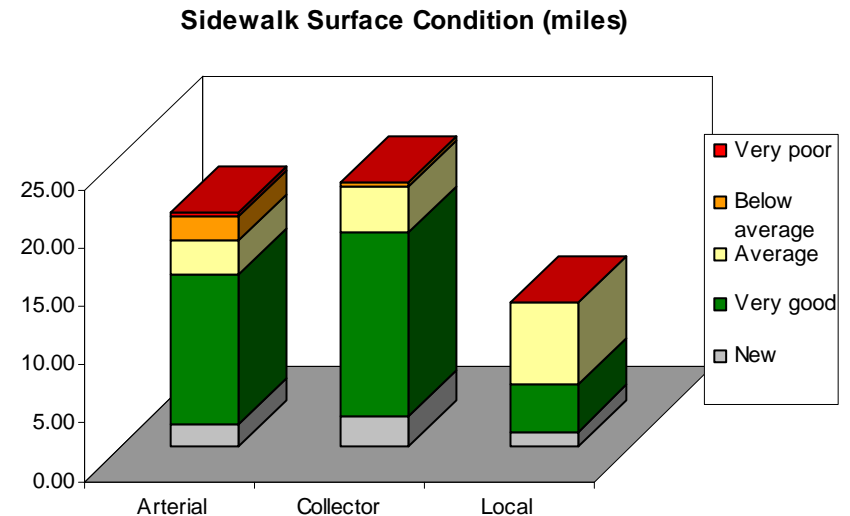
Figure 2-2. Lakewood Sidewalks by Functional Classification



Sidewalk Condition

As summarized in **Figure 2-3**, there are only a few miles of sidewalks on non-local streets that may need to be replaced due to poor surface conditions. It was found that the older developed areas have a larger portion of older sidewalks needing repair. In some cases these areas were developed prior to the current sidewalk design standards and/or site development standards that required sidewalks to be built on both sides of the street. Older Lakewood neighborhoods are the subject area with a larger number of missing sidewalks and sidewalks in poor condition (see also Appendix A, Figure A-2).

Figure 2-3. Sidewalk Condition (miles) by Street Classification



Sidewalk Width

Most of the study area existing sidewalks are at least four feet wide. Many sidewalks are five feet or wider, as shown in Figure A-3 in Appendix A. Only a small percentage of existing sidewalks are less than four feet wide, mostly along arterials or collectors. Not all of the existing sidewalks are free of obstacles that reduce the effective clear width (minimum of four feet), but the fact that the majority of existing sidewalks are at least four feet or wider is an excellent starting point of the Lakewood NMTP.

Figure 2-4. Sidewalk Width (miles) by Street Classification

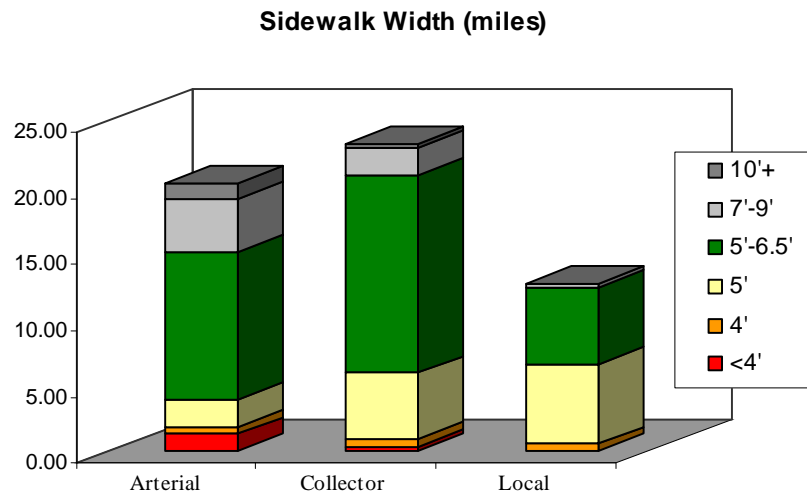
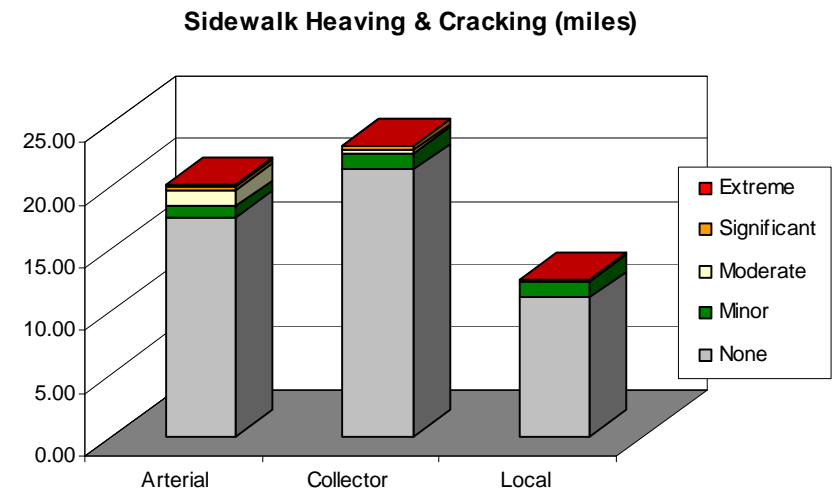


Figure 2-5. Sidewalk Heave & Cracking (miles)



Heaving and Cracking

Sidewalks with significant heaving and cracking can be problematic for pedestrians with limited mobility. Only a small portion of the study area sidewalks have significant or extreme heaving and cracking conditions. Many of these sidewalks are located next to buffer strips where older trees are causing significant heaving, especially along principal and minor arterials.

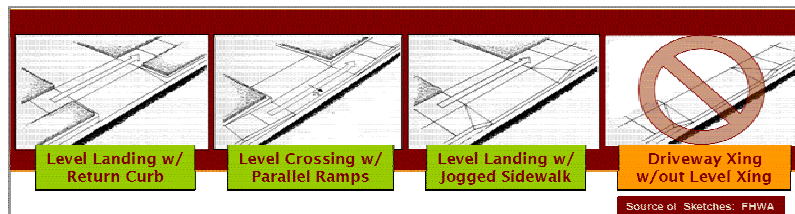
Obstacles

The inventory program was developed specifically to identify the location, type and density of fixed and removable obstacles found along existing sidewalks. The majority (75%) of existing sidewalks do not have fixed obstacles that reduce the pedestrian clear width of four feet. Of course the type of fixed obstacle is important. Some obstacles may be relatively easy and inexpensive to move or remove. Review of the data indicates that utility poles are the predominant type of fixed obstacle that reduces the sidewalk clear width below four feet; these are likely the most difficult and expensive fixed obstacle to remove from the sidewalk area. Signs and mailboxes are also common occurrences. Very few moveable obstacles were noted in the inventory.

Driveway Crossings

Figure 2-6 illustrates a number of different driveway crossing examples. The type of driveway crossing design can also be a factor in pedestrian mobility. A large number of older sidewalks were constructed without level landings, especially along principal and minor arterials. The City of Lakewood has revised its sidewalk standards to require level sidewalks as they cross driveway access points.

Figure 2-6. Examples of Driveway Crossing Treatments

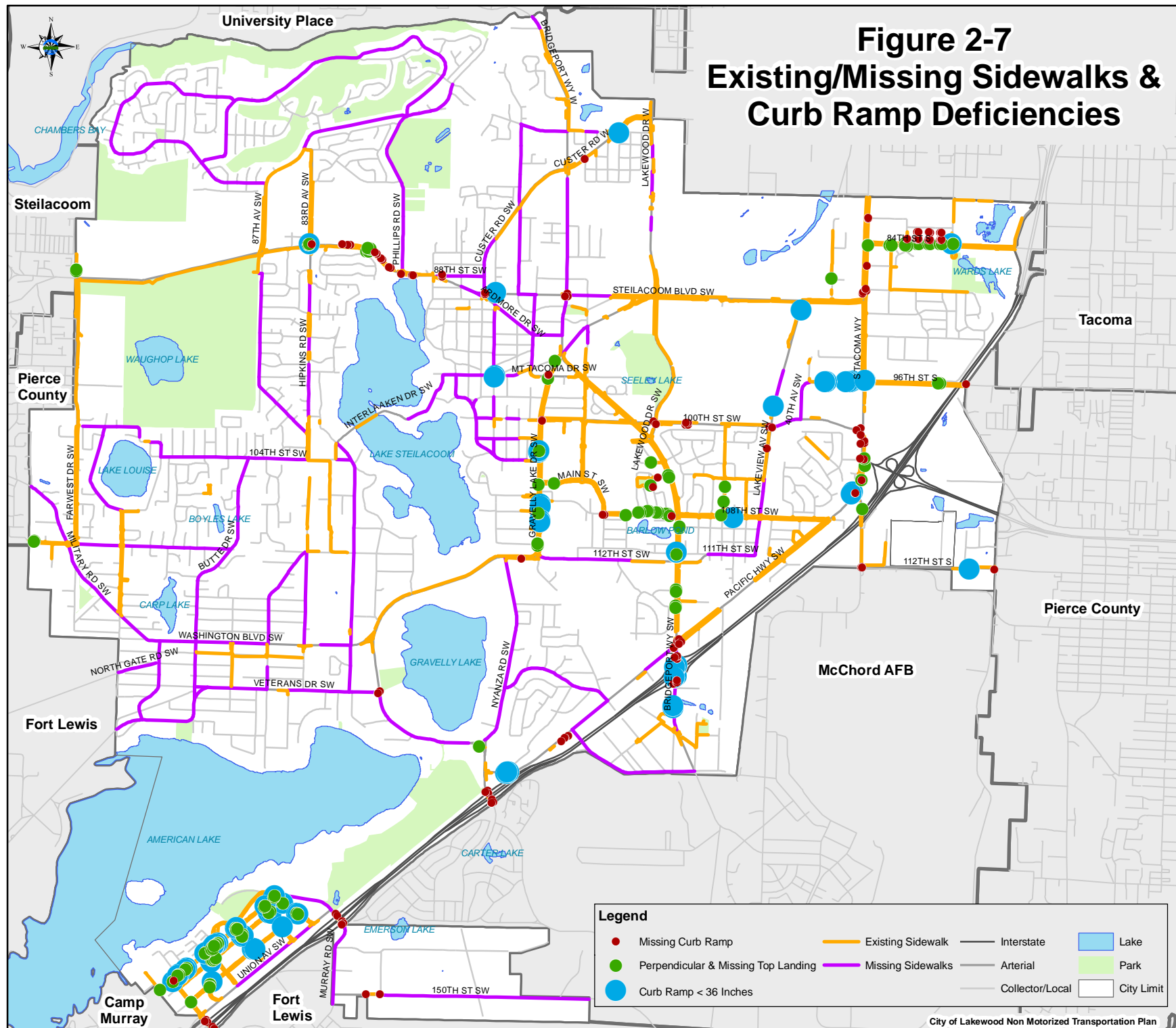


Missing Sidewalks

In general, and over the past 10 years since incorporation, the City of Lakewood has been ensuring that sidewalks are constructed on both sides of new streets. As a result, newer subdivisions have few missing sidewalks. A greater number of streets with missing sidewalks are located within older neighborhoods.

Figure 2-7 illustrates the location of existing and missing sidewalks throughout the City of Lakewood.

Figure 2-7



Curb Ramps

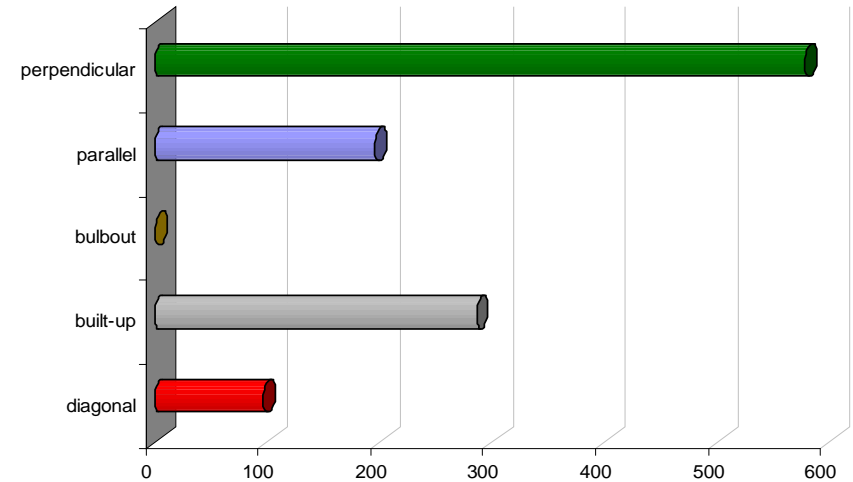
Of the more than 1,281 street corners inventoried along existing sidewalk corridors, only about 10 percent are missing curb ramps. All other corners have some type of curb ramp to assist the mobility-impaired pedestrian when crossing the street. See Chapter 6, Figure 6-7 for illustrations of different curb ramp types.

However, a number of the existing curb ramps are essentially ADA non-compliant. ADA non-compliance can generally mean that: (a) the ramp width is too narrow; (b) the top landing is either missing or too narrow; or, (c) the ramp slope is too steep. The construction of many of the non-compliant ramps preceded enactment of the ADA.

Ramp Type

The majority of curb ramps constructed in the City of Lakewood study area are perpendicular by design, with two ramps oriented to each respective crosswalk. Perpendicular curb ramps are found in downtown Lakewood as well as scattered throughout the rest of the City. There is a significant cluster of perpendicular curb ramps in the southwestern neighborhood of Tillicum. In recent growth areas, most new curb ramps have been constructed to standards with diagonal ramp designs, to align with curb-side sidewalks.

Figure 2-8. Curb Ramp Type



Ramp Width

ADA requires that curb ramps be constructed with a minimum width of 3 feet and desired width of 4 feet. Some of the curb ramps throughout the study area were built with widths well below 4 and sometimes 3 feet. Most of these ramps were constructed to design standards that preceded the ADA. However, they do meet the minimum design width as prescribed by ADA.

Figure 2-9. Curb Ramp Width

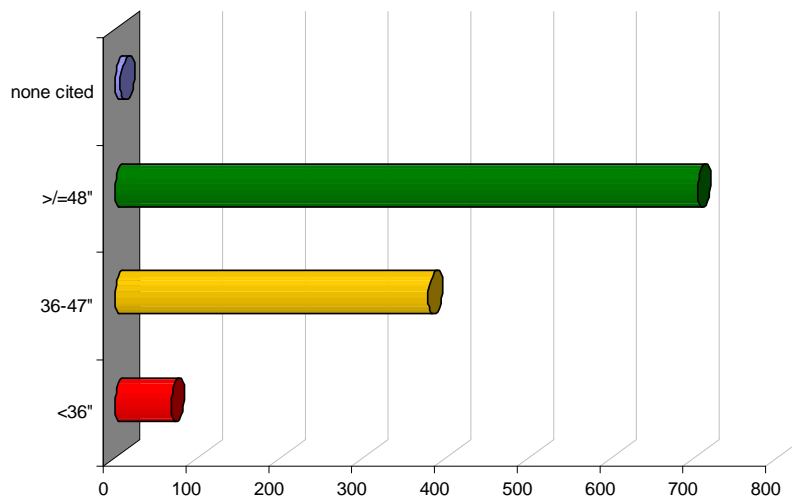
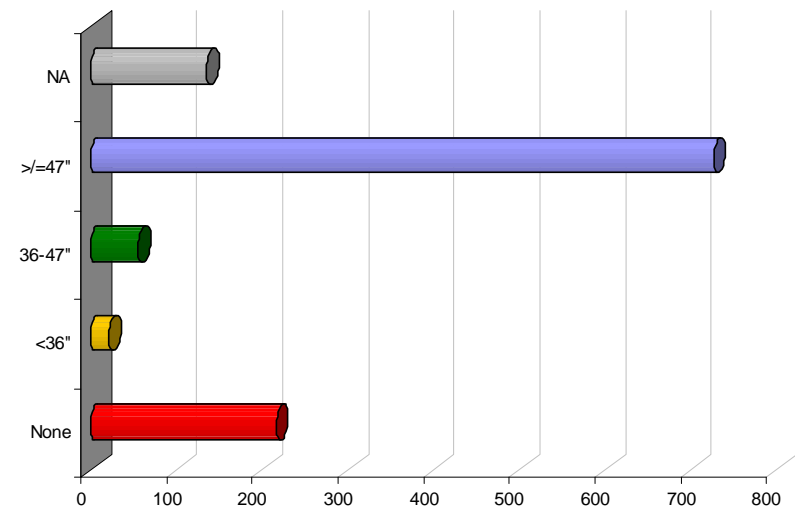


Figure 2-10. Curb Ramp—Top Landing



Top Landing

ADA requires that a top landing be placed at all curb ramps, four feet wide and a slope not to exceed 2 percent. Some of Lakewood's curb ramps are either missing the top landing or the ramp widths are too narrow.

Attribute Index

To complete the self-evaluation of existing sidewalks and curb ramps a scoring assessment was calculated. Each sidewalk segment and curb ramp in the GIS database was assigned an attribute index value for further evaluation in the prioritization of pedestrian improvements (see Methodology for Prioritizing Pedestrian Projects). The attribute index enables the City of Lakewood to consistently measure and quantify problematic sidewalks and curb ramps that may pose as obstacles to the mobility-impaired. Table 2-2 summarizes the Attribute Index scoring values for sidewalks, missing sidewalks, curb ramps and missing curb ramps.

A higher attribute index value reflects a poorer condition of the existing sidewalk or curb ramp. For example, a curb ramp that scores 35 points (out of a possible 35 points maximum for prioritized need) would reflect the following conditions:

Top Landing	-	Missing
Ramp Width	-	Less than 3 Feet
Ramp Slope	-	Exceeds 8.3 Percent
Surface Condition	-	Very Poor
Alignment	-	At Angle with Curb Line
Cross-Slope	-	Exceeds 2 Percent
Gutter Slope	-	Exceeds 2 Percent

Table 2-2. Attribute Index

		Possible Points
Sidewalks		
	Surface Condition	5
	Heave & Cracking	5
	Width	5
	Fixed Obstacles (density)	5
	Driveways	5
	Curb Type	5
	Cross-Slope	5
	Total	35
Missing Sidewalk		35
Curb Ramps		
	Top Landing Width	5
	Ramp Width	5
	Ramp Slope	5
	Surface Condition	5
	Alignment	5
	Cross Slope	5
	Gutter Slope	5
	Total	35
Missing Curb Ramp		35

Summary

By successfully deploying the GPS-based data collection effort, the City of Lakewood was able to inventory the critical pedestrian facilities with the Lakewood urban area. The inventory effort was completed within the pre-planning estimates for staffing and schedule, and was successfully formatted and assimilated in the City of Lakewood's GIS database. The Self-Evaluation and scoring, summarized in the Pedestrian Attribute Index, provides one of the essential measures from which the City analyzes, identifies and prioritizes pedestrian improvements.

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Non-Motorized Transportation Plan



Chapter 3—Methodology for Prioritizing Pedestrian Needs

Pedestrian Priority Index

Future pedestrian improvements in the city should be prioritized so the City of Lakewood can effectively implement the NMTP recommendations. The prioritization method must consider the relative cost of needed pedestrian improvements to maximize the public's investment within Lakewood areas that require higher levels of pedestrian accessibility. The City of Lakewood's Pedestrian Priority Index (PPI) was based on separate index measures for attributes and accessibility.

Attributes

The summary and evaluation of existing sidewalks and curb ramps identified for each pedestrian attribute is given a condition rating, ranging from very poor to good or excellent (see Chapter 2 – Inventory and Self-Evaluation). The current pedestrian system attributes in the poorest condition (or missing) were scored highest in the Attribute Index as the segments in greatest need for improvement.

Accessibility

The closer that needed pedestrian improvements are located to various important trip generators and transportation facilities, the higher their priority. A series of critical accessibility indices are grouped into a composite Accessibility Index to help prioritize improvements.

Point scoring was established for each index. Table 3-1 summarizes the component index ratings, point values and scoring values of the composite PPI. A total of 35 points is possible within the *Attribute Index*. Those sidewalks or curb ramps whose attributes are all in very poor condition (or missing sidewalks and curb ramps) could be scored as high as 35 points. A total of 66 points is possible within the

Accessibility Index. The total possible score for the PPI is 101. After initial review, the Lakewood NMTP Steering Committee (see Chapter 1) ranked, weighted and prioritized the accessibility measures (see Appendix B for Committee ranking).

Defining the Accessibility Indices

A range of spatial index measures were developed to identify and quantify critical pedestrian access issues in Lakewood. Access at the pedestrian trip ends (origins and destinations) and pedestrian access to critical transportation system features (bus transit and arterial streets) were developed based on currently available technology (the City of Lakewood GIS data) and relevant data information (2000 US Census).

School Sites

Many students walk or ride bicycles on the sidewalks to school. Students, particularly younger children, are among the most vulnerable pedestrians. Areas around schools, where student pedestrians congregate, require special attention in the form of pedestrian facilities and safety measures. The highest value of 5 was assigned to areas within an eighth of a mile from a school (see Appendix A, Figure A-4).

Walk to School Routes

Along the same lines as schools, walk to school routes also service student pedestrians and require special attention due to safety issues. Areas within fifty feet on either side of a designated walk to school route were assigned an accessibility index value of 5 (see Appendix A, Figure A-4). An interim walk-to-school route map has been prepared for each of the schools within the Clover Park School District (see Appendix C). When combined, the two accessibility measures related to school sites and routes can total 10 possible points.

Table 3-1. Pedestrian Priority Index Ratings, Point Values and Numeric Scores

Index Criteria	Location Rating	Point Value	Possible Score
ATTRIBUTE INDEX	<i>Calculation of all scores summarizing Rating of Existing Conditions</i>		35
ACCESSIBILITY INDICES		Total	
Schools		10	10
Proximity to Schools	Within 1/8-mile radius of school	5	
Walk-To-School Route	Within 50 feet on either side of route	5	
Central Business District	Within 1/4-mile radius of civic/commercial center	5	5
Local Business/Civic Centers	Within 1/4-mile radius of neighborhood centers	5	5
Parks	Within 1/8-mile radius of park	5	5
Transit		5	5
Transit Route	Within 50 feet on either side of route	1	
Transit Bus Stops	Within 1/8-mile of transit stop	4	
Traffic Signal/Roundabout	Within 1/8-mile of signal or roundabout	5	5
Street Functional Class	(route continuity – accessibility)	5	5
Principal	Within 50 feet on either side of street	5	
Minor Arterial	Within 50 feet on either side of street	4	
Collector	Within 50 feet on either side of street	3	
Local	(all other)	1	
Lower Income Residence	Within Census Tract – below poverty line	5	5
Disabled Residents	Top Third (US Census Density*)	5	5
Population / Employment Density	Per Matrix	6	6
Senior Housing	Within 1/16-mile radius of Senior Housing site	5	5
Walk-To-Work	Within Census Tract/Block Group	5	5
COMPOSITE ACCESSIBILITY INDEX			66
COMPOSITE PEDESTRIAN PRIORITY INDEX			101

Local Business and Civic Centers

Access to public buildings is a critical component of Title II of the ADA. Libraries, court houses and other public buildings provide a wide-range of services to children, senior adults, and mobility-impaired residents. Areas within a quarter-mile of these facilities have been an accessibility index value of 5 (see Appendix A, Figure A-5).

Central Business District

Similar to access to local business and civic centers, access to Lakewood's Central Business District (CBD) is a significant part of Title II of the ADA. The community demands access to the goods and services offered in the CBD by national and regional chains, as well as access to any of the public facilities located in this area. Areas within a quarter-mile of this district have been assigned an accessibility index value of 5.

Parks

Parks attract recreational users of all ages. Pedestrian access and safety facilities are essential to park accessibility. Some linear parks also include multi-use trails that provide critical transportation connections for pedestrians and cyclists. Accordingly, areas within distances from Lakewood's many parks were assigned variable accessibility index values, decreasing in value with distance. The values assigned were 5 for areas within one-eighth of a mile, 4 between one-eighth and one-quarter mile, 3 between one-quarter and one-half mile, and 1 within one mile from a local park entrance (see Appendix A, Figure A-6).

Public Transit

Pierce County Transit provides public bus service to the City of Lakewood. Some of the transit riders begin and end their trips as pedestrians and almost all will access the bus at stops requiring pedestrian facilities. Similarly, areas along bus routes will most likely be used by bus riders to get to the bus stops. Safe and continuous pedestrian facilities that link the bus stops to the surrounding area

are an integral component of the public transit system. Areas within 1/8-mile of the bus stops in Lakewood have been assigned an accessibility index value of 4 and areas within 50 feet on either side of a bus route have been assigned a value of 1, making a total value of 5 for areas associated with public transit (see Appendix A, Figure A-7).

Traffic Signals/Roundabouts

Crosswalks at traffic signals and roundabouts provide a means for pedestrians to safely cross busier arterial and collector streets. Areas to the sides of the intersections serve as a gathering point for pedestrians to congregate while waiting to cross the street. Due to the importance of facilities where pedestrians gather, areas within one-eighth of a mile of a traffic signal or roundabout have been given an accessibility index value of 5 (see Appendix A, Figure A-8).

Street Functional Classification

Streets function as ways to move in and around the City of Lakewood. Different classifications of roadways demonstrate the purpose of each type. Principal arterial streets are usually used to move traffic through local jurisdictions and are often state highways. High vehicle volumes at higher speeds intensify the need for separate pedestrian access and safety facilities. Without them, principal arterials become significant barriers to pedestrians of all kinds, but especially to the mobility-impaired. Areas within fifty feet on either side of a principal arterial were given an accessibility index value of 5. As the speeds and volumes decrease on other classified streets (minor arterials, collectors, and local streets), the barrier the street presents to pedestrians starts to diminish. For this reason, the accessibility index value also decreases. Minor arterials were assigned a value of 4, and collectors were assigned a value of 3.

Lower Income Residents

Residents with lower income are more likely to travel by walking, biking, or riding public transit than residents with higher incomes. In all cases, pedestrian facilities would be used to some degree, making pedestrian connections and safety a concern. For this

reason, areas (U.S. Census Bureau Block Groups data) in Lakewood below the poverty line (according to 2000 US Census Data¹) were given an accessibility index score of 5 (see Appendix A, Figure A-9).

Mobility-Impaired Residents

Mobility-impaired residents are those with a sensory and/or a physical disability. For this analysis, pedestrian access and safety facilities were determined more essential to those who are mobility-impaired than those with other impairments. These residents depend on pedestrian facilities operating at a satisfactory level in order to get about. As such, areas in Lakewood with a notable percentage of mobility-impaired residents were given a value of 5 (see Appendix A, Figure A-10).

Population & Employment Density (Year 2030)

Future (year 2030²) residential population and employment in Lakewood was used as a measurable surrogate for land use intensity, in turn an indicator of pedestrian travel demand. Transportation analysis zones (TAZs) with high residential population and high employment utilize pedestrian facilities more than other areas because of the higher land use density. These land use attributes were measured by (a) dwelling unit per acre (for population) and (b) jobs per acre (for employment); and broken into approximate quarters at natural breaking points among the data. The resulting accessibility index values were highest for TAZs with very high densities both in population and employment, which were given a value of 3. Values decrease down to zero for those TAZs in the two bottom quarters with little to no residential population and employment (see Appendix A, Figure A-11).

Walk to Work Residents

People who walk to work in Lakewood use pedestrian facilities and often cross higher speed streets. For those areas of Lakewood where there are a relative higher percentage of residents walking to

work there is a higher need for attention to pedestrian facilities and pedestrian safety. These areas with a higher proportion of residents who walk to work were assigned an accessibility index value of 5 (see Appendix A, Figure A-12).

Senior Adult Housing

Senior adults are typically thought to utilize alternate means of transportation (walking and public transit) more than younger adults. There are only limited senior and adult housing facilities in Lakewood. Nearby pedestrian facilities and their condition may be a safety concern. Due to this, an area within one-sixteenth of a mile from an adult home was given a value of 5 (see Appendix A, Figure A-13).

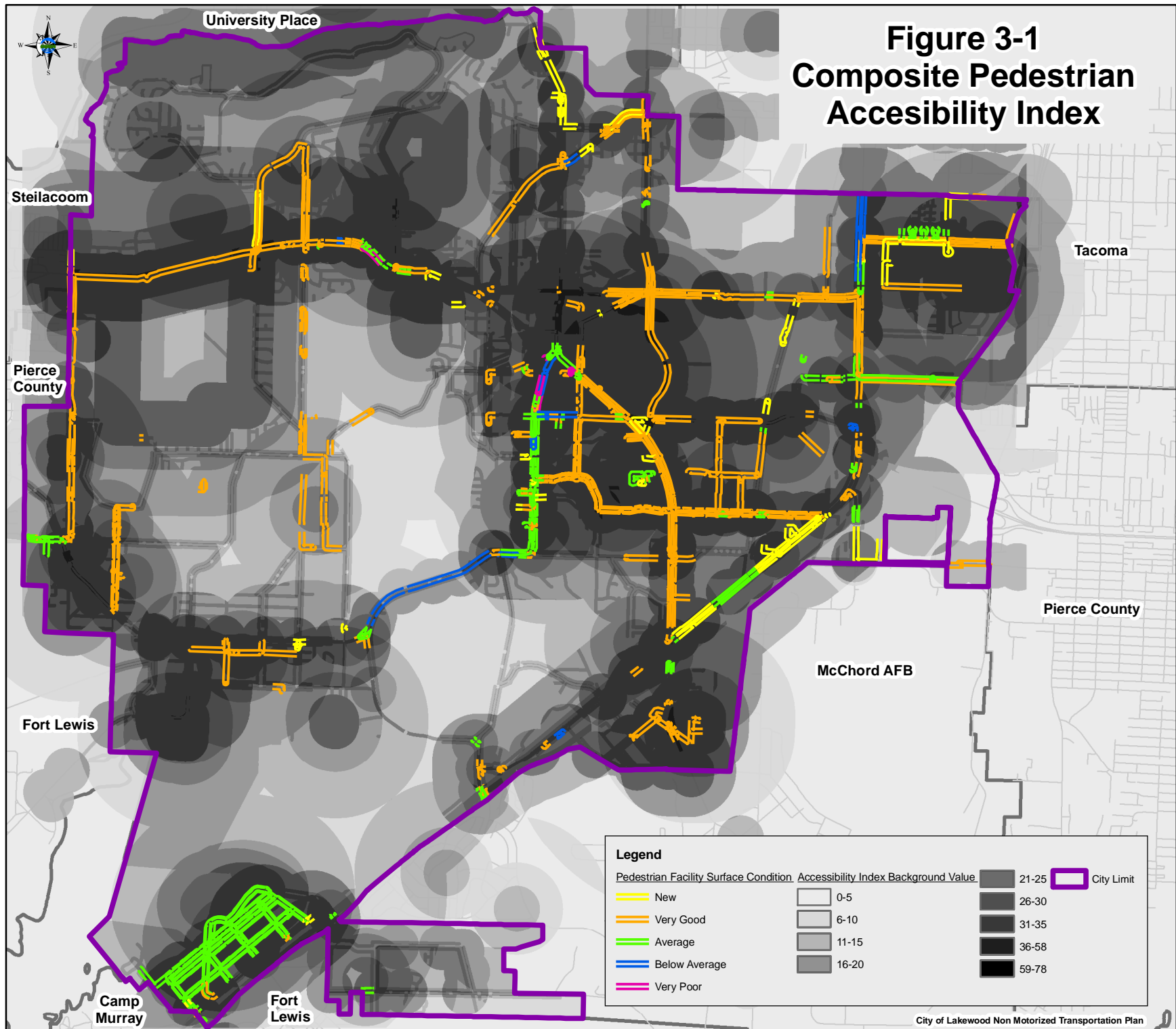
Composite Map

The Composite accessibility index map is illustrated in **Figure 3-1**. As shown, areas in darker shading reflect higher pedestrian accessibility index values. Also illustrated in Figure 3-1 are streets with missing sidewalks or sidewalks in poor condition. As example, those poor or missing sidewalks within the darkest shaded areas are ranked the highest in priority for future improvements. These values and scoring, form the basic input into the prioritization of pedestrian system improvements.

¹ U.S. Bureau of Census, 2000.

² Puget Sound Regional Council. Population, Housing and Employment Estimates – 2008.

Figure 3-1 Composite Pedestrian Accessibility Index



Planning-Level Costs Estimates

A set of planning-level unit cost measures were prepared within the City of Lakewood GIS database to help estimate the cost of future pedestrian improvements. These costs are not necessarily reflective of actual costs, but provide a comparative basis for establishing priorities and evaluating future programs. All possible pedestrian system improvements were assigned a planning-level cost estimate. The unit costs were based on recent roadway and sidewalk improvement project needs completed within the City of Lakewood. **Table 3-2** includes a summary of the unit costs estimates used to develop the planning-level costs of possible pedestrian improvements. All costs were based on 2007 dollars and do not include right-of-way costs, assuming that most improvements are within existing right-of-way.

Table 3-2. Planning-Level Unit Costs	
Improvement	Unit Cost
Curb Ramps	\$1,500 (per ramp)
Sidewalks	Per Lineal Foot
Sidewalk, Curb, Gutter & Drain	\$300
Sidewalk Only- at-grade	\$35
Sidewalk Only- separated path	\$22

Identifying Pedestrian Improvement Needs and Their Priorities

Those potential sidewalk or curb ramp improvements with the highest Composite PPI score should have the highest priority for future project completion. The Composite PPI was applied to all sidewalk segments and curb ramp locations, including missing sidewalk segments and missing curb ramps.

GIS Database Applications

A series of interim queries of the City of Lakewood GIS database were made to ensure that the definition and selection of pedestrian improvement project priorities do not duplicate or double-count “needs” already identified in the City of Lakewood’s 2006 TIP.

Pedestrian Improvement Needs for Full ADA Compliance

The cost to build new and improved sidewalks and curb ramps along all of Lakewood’s public streets is estimated at \$369 million. **Table 3-3** summarizes these pedestrian improvement cost estimates by priority and improvement type. Not all pedestrian improvements are essential for system pedestrian mobility and access, nor to comply with ADA policies. In fact, the majority of these costs are assumed for new sidewalks along local, residential streets in areas where such improvements are only likely to occur when constructed by the local property owner.

Table 3-3. Pedestrian Improvement Costs (2007 dollars, in millions - rounded)				
Pedestrian Improvements	Priority			
	High	Medium	Low	Total
I New Sidewalks	\$ 27.2	\$163.6	\$166.2	\$357.0
Sidewalk Repairs	\$ 2.8	\$2.5	\$5.0	\$10.3
New Curb Ramps	<\$0.1	<\$0.1	<\$0.1	<\$0.1
Curb Ramp Repairs	\$0.6	\$0.4	\$0.7	\$1.7
Total	\$30.6	\$166.5	\$171.9	\$369.0

As listed in **Table 3-4**, three priority groups were established based on the composite accessibility index score for various missing and existing sidewalks and curb ramps. Slightly higher emphasis was placed on new curb ramps and sidewalks in scoring the accessibility index for candidate projects. *[Note: see Chapter 8 which includes refined planning assessment of sidewalk and curb ramp projects and their costs]*

Table 3-4. Accessibility Index Thresholds (Project Prioritization)

	Priority—Accessibility Index Values		
	High	Medium	Low
New Sidewalks	>81	63-80	<62
Sidewalk Repairs	>58	50-57	<50
New Curb Ramps	>83	72-82	<72
Curb Ramp Repairs	>54	46-53	<46

The cost of constructing new sidewalks is the largest of all improvement costs, and the greatest portions of these costs are amongst the “medium” and “low” priorities. Low priority, new sidewalk improvement needs are essentially in areas outside many or all of the accessibility measures calculated as part of the study. The *High* (\$ 30.6 million) priority pedestrian improvements are the focus of the study and NMTP. These improvements are located in areas where pedestrian activity is highest (e.g. near schools and transit stops, or near dense population and employment centers) and needed accessibility improvements are greatest (e.g. along or across busy arterials or near civic buildings).

High Priority Pedestrian Improvement Needs

As listed in **Table 3-3**, and shown in **Figure 3-2**, *High* priority pedestrian improvement needs are estimated to cost about \$30.6 million, the majority of which are either new sidewalks or sidewalk repairs.

New Sidewalks

Installing new sidewalks along critical street corridors helps remove significant obstacles to pedestrians of all types. Those streets that currently do not have sidewalks on one or both sides of the street were identified in the NMTP for the installation of new sidewalks.

Sidewalk Repairs

Reconstructing existing sidewalks with significant structural problems can greatly improve pedestrian safety and access, particularly for the young, elderly and mobility-impaired pedestrians. Existing sidewalks were identified for reconstruction if they are currently rated with either (a) significant-extreme heaving and cracking, (b) substandard width (less than four feet in width), or (c) below average or very poor surface condition.

New Curb Ramps

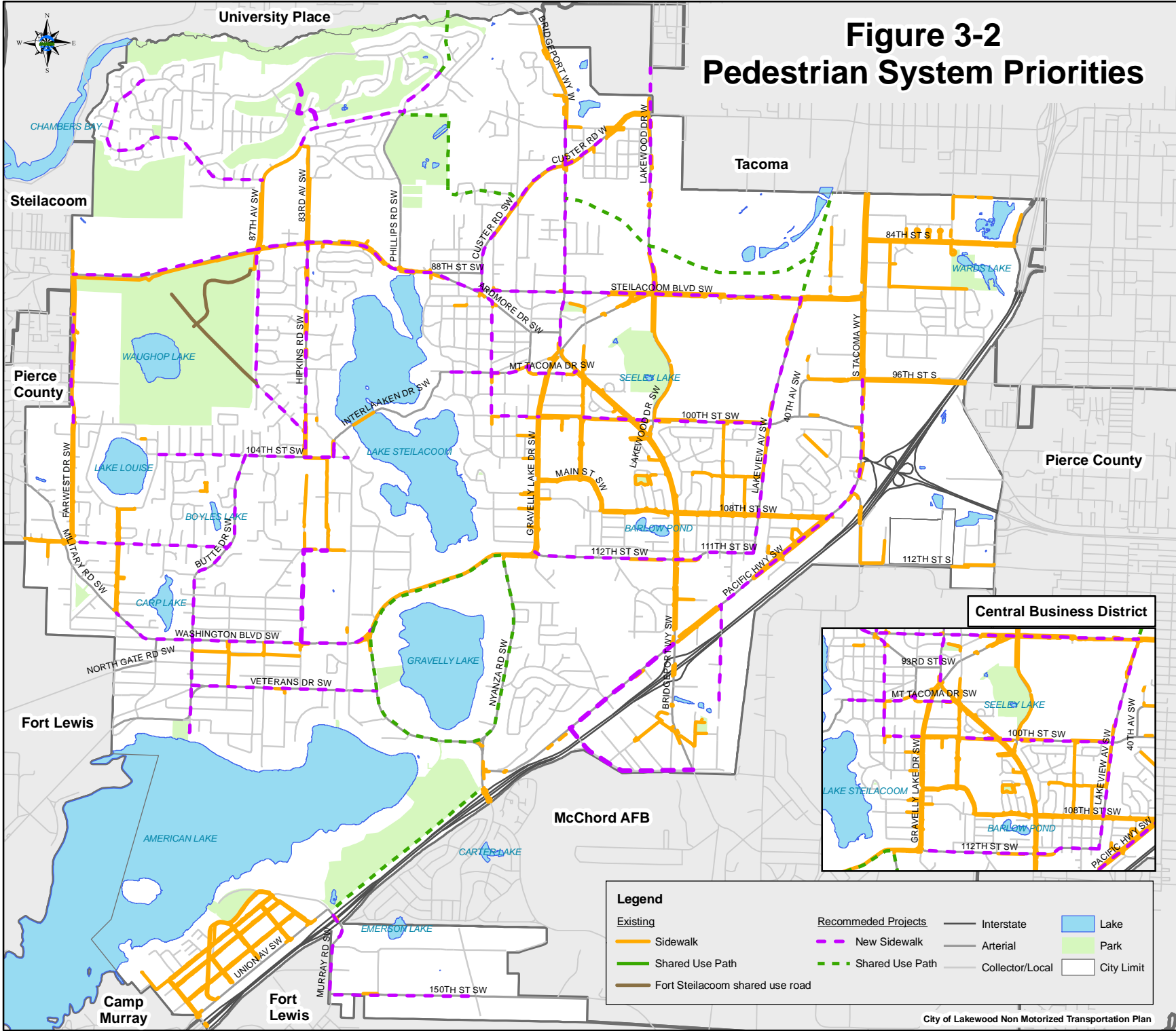
Installing new curb ramps in critical locations will significantly remove obstacles for the mobility-impaired pedestrian. Those street corners that currently do not have curb ramps were identified in the NMTP for the installation of new curb ramps.

Curb Ramp Repairs

Some of Lakewood’s older curb ramps are in such poor condition that they are more a hindrance and barrier to pedestrians than they are helpful. Through reconstruction these curb ramps can provide the needed safety and access improvements for the mobility-impaired and others. Existing curb ramps were identified for reconstruction if they are currently rated with either (a) very poor surface condition, (b) non-compliant ramp width (less than three feet wide), (c) non-compliant top landing (missing or less than 3 feet wide), or (d) non-compliant ramp slope (8.4% or greater).

This high priority pedestrian “needs” identified using the PPI method provide a more efficient means of defining NMTP projects for implementation over the next five to twenty years. These needs are based on critical accessibility measures and a weighting of Lakewood’s priorities. Chapter 8 includes the Pedestrian System Plan, where these “needs” are translated and integrated into specific projects.

Figure 3-2 Pedestrian System Priorities



Legend

Existing

- Sidewalk
- Shared Use Path
- Fort Steilacoom shared use road

Recommended Projects

- New Sidewalk
- Shared Use Path

- Interstate
- Arterial
- Collector/Local
- Lake
- Park
- City Limit

Using the Pedestrian Priority Index

The PPI provides the City of Lakewood with an objective methodology for selecting and prioritizing pedestrian system improvements. This methodology provides an initial basis for project identification as input into the City of Lakewood's Transportation Improvement Program (TIP). However, professional judgment will always be required to select appropriate projects. Other factors will likely need to be evaluated by the City of Lakewood, including relationship to:

- Other TIP projects
- Special grant application projects
- Pending development projects, and
- Prevailing site conditions.

See Chapter 9 - Recommended Measures to Implement the NMTP for further recommendations regarding pedestrian project funding and the TIP.

It is recommended that the PPI calculation be reviewed and updated every three years, concurrently with regular updates of the City of Lakewood's TIP. In this manner The City of Lakewood can incorporate the completion of pedestrian improvements that are installed with roadway widening or new street projects identified in the TIP. Doing so will ensure that pedestrian priorities reflect pedestrian and street project completion, new development, and other land use changes.

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Non-Motorized Transportation Plan



Chapter 4—Existing Bicycle System

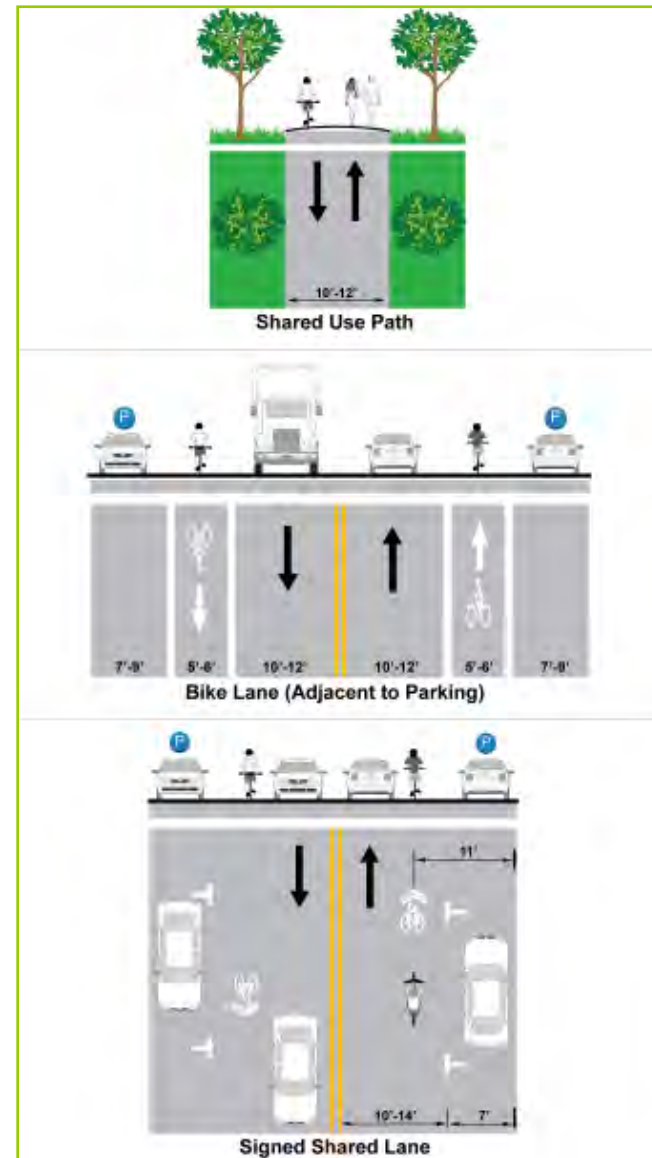
Introduction

Two fundamental building blocks are needed in understanding the study of Lakewood's bicycle system: (1) a baseline definition of the various terms and language used in describing bicycle facilities, and (2) acknowledging the physical constraints which have limited Lakewood's bicycle system development. Each of the building blocks is described here.

Revising the Bicycle Planning Language

The City of Lakewood can begin more proactive planning for bicycle facilities by first expanding upon and clarifying the definitions of the various bicycle facilities, especially for the on-street bicycle system. Historical plan documentation in Lakewood has concluded in text and mapping a "Bikeway," network, some of which may be implied to mean on-street bicycle lanes. What are bikeways? Are they separate lanes for cyclists or a series of signs and painted symbols that indicate for both motorists and cyclists the need to share the outside travel lane? There is need for further clarity in these definitions, otherwise planners, engineers, policy officials and the general public might be unclear what the NMTP full intentions are. **Figure 4-1** illustrates the basic forms of bikeway facilities as defined by AASHTO.¹ Pavement markings and signing guidance is provided by the Manual of Uniform Traffic Control Devices (MUTCD)².

Figure 4-1. Bikeway Facility Definitions



¹ Association of American State Highway Transportation Officials. Guide for the Development of Bicycle Facilities, Washington, D.C. 1999.

² Manual of Uniform Traffic Control Devices, U.S. Department of Transportation - Federal Highways Administration, 2004.

Consistent with the MUTCD, the City of Lakewood should adhere to the following definition of terms concerning bicycle facilities:

Bicycle Facilities

This is a general term denoting improvements and provisions that accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically defined for bicycle use.

Bikeway

Bikeway is a generic term for any road, street, path that in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for exclusive bicycle use or are to be shared with other travel modes.

Bicycle Lane

A bicycle lane is a portion of a roadway that has been designated by signs and pavement markings for preferential or exclusive use by bicyclists. Bicycle lanes are one-way facilities that are placed on both sides of a street, and they carry bicyclists in the same direction as adjacent vehicle traffic. In addition to lane striping, pavement and signage identify lanes.



Another type of bicycle lane is a bikeway. Shoulders are paved at least four feet in width, and are separated from travel lanes with a lane stripe. This facility is typically applied to a rural cross-section that does not have curb and gutter.



Designated Bicycle Routes

Designated bicycle routes consist of a system of bikeways designated by the jurisdiction having authority with appropriate directional and informational route signs, with or without specific bicycle route numbers. Bicycle routes, which might be a combination

of various types of bikeways, should establish a continuous routing. Designated bicycle routes can be divided into shared roadway and shared-use path facilities.

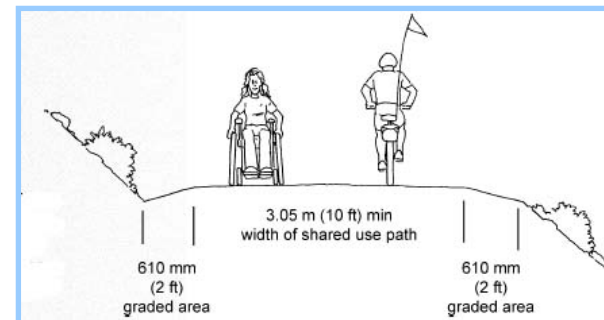
Shared Roadway

On a shared roadway, bicyclists and motorists use the same travel lane. Shared roadways bicycle routes can be placed on streets with wide outside travel lanes, along streets with bicycle route signing, or along local streets where motorists have to weave into the lane in order to safely pass a bicyclist.



Shared-Use Path

A shared-use path is a bikeway outside the traveled way and physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent alignment. Shared-use paths are also used by pedestrians (including skaters, users of manual and motorized wheelchairs, and joggers) and other authorized motorized and non-motorized users. Shared-use paths primarily attract recreational users, because they typically wind through and connect destinations; they also are an excellent opportunity to function as non-motorized transportation routes. For any cyclist uncomfortable with using roads with vehicles, shared-use paths may be the preferred facility.



Shared-use paths should be constructed to minimum widths of 10 feet
(Source: FHWA *Designing Trails and Sidewalks for Access*)

Implementation of these specific terms will help advance consistent dialogue between the City of Lakewood and the community regarding bicycle facility planning and design, within the context of multi-modal systems development.

Defining Bicycle Users

There are a variety of bicyclists traveling within the study area, depending on their skills, confidence and preferences. According to AASHTO,

“some riders are confident riding anywhere they are legally allowed to operate and can negotiate busy and high speed roads that have few, if any, special accommodations for bicyclists. Most adult riders are less confident and prefer to use roadways with a more comfortable amount of operating space, perhaps with designated space for bicyclists, or shared use paths that are away from motor vehicle traffic. Children may be confident riders and have excellent bike handling skills, but have yet to develop the traffic sense and experience of an everyday adult rider.”

For the purpose of this study the following categories of bicycle user types are applied as the impact of different bicycle facility types are determined:

Advanced or experienced riders are generally using their bicycles as they would a motor vehicle. They are riding for convenience and speed and want direct access to destinations with a minimum of detour or delay. They are typically comfortable riding with motor vehicle traffic; however, they need sufficient operating space on the traveled way or shoulder to eliminate the need for either themselves or a passing motor vehicle to shift position.



Source: www.canada.com/ottawacitizen/news

Basic or less confident adult riders may also be using their bicycles for transportation purposes, e.g., to get to the store or to visit friends, but prefer to avoid roads with fast and busy motor vehicle traffic unless there is ample roadway width to allow easy overtaking by faster motor vehicles. Thus, basic riders are comfortable riding on neighborhood streets and shared use paths and prefer designated facilities such as bike lanes or wide shoulder lanes on busier streets.



Source: www.contextsensitivesolutions.org

Children, riding on their own or with their parents, may not travel as fast as their adult counterparts but still require access to key destinations in their community, such as schools, convenience stores and recreational facilities. Residential streets with low motor vehicle speeds, linked with shared use paths and busier streets with well-defined pavement markings between bicycles and motor vehicles can accommodate children without encouraging them to ride in the travel lane of major arterials.

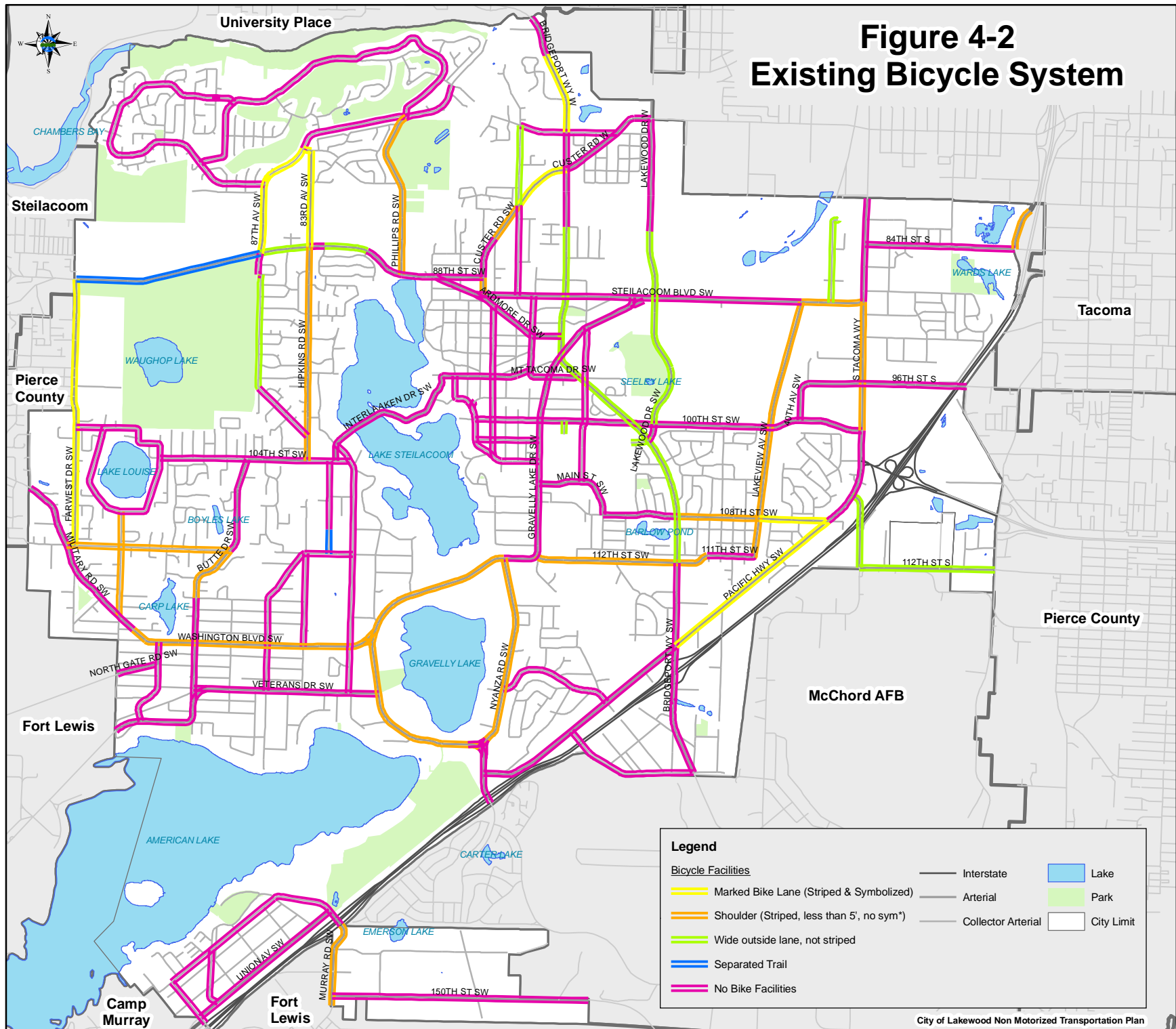


Source: www.indygreenways.org

Local Geography

Natural geographic features, historic rural residential patterns and other transportation constraints have limited bicycle system connectivity in the Lakewood urban area, including I-5, Sound Transit railroad and various lakes and streams. As a result, Lakewood's bicycle system has many excellent features but is lacking cohesiveness and connectivity. **Figure 4-2** maps the current bicycle system within the Lakewood urban area.

Figure 4-2 Existing Bicycle System





Non-Motorized Transportation Plan



Chapter 5—Non-Motorized Policy Guide

Introduction

Numerous federal and state policies and statutes affect the planning and development of Lakewood's non-motorized transportation system. This chapter provides an overview of those policies and requirements, and summarizes a policy framework for both the pedestrian and bicycle elements of the NMTP. The policy framework outlines the pedestrian and bicycle goals and then a series of objectives, policies and implementation strategies by which the City can coordinate and guide the implementation of NMTP as an integral component of the Lakewood comprehensive plan. The policy guide concludes with a summary of state funding sources for non-motorized projects.

Federal Policy

The USDOT has issued policy guidelines¹ for public agencies, professional associations, advocacy groups, and others to better integrate bicycling and walking into comprehensive transportation plans. More specifically, USDOT has emphasized that bicycling and walking facilities are to be incorporated into all transportation projects unless exceptional circumstances exist. There is a certain amount of flexibility for the type of facility and the design elements that are required to ensure accessibility.

This federal approach is intended to provide guidance for the accommodation of bicyclists and pedestrians and can be adopted by state and local agencies and other groups as a commitment to developing a transportation infrastructure that is safe, convenient,

accessible, and attractive to motorized and non-motorized users alike.

After setting forth a policy requiring that bicyclists and pedestrians (including people with disabilities) be fully integrated into the transportation system, state and local governments should encourage engineering judgment in the application of the range of available treatments. An example of the federal policy regarding bicycle facilities states that collector and arterial streets shall typically have a minimum of a four-foot wide striped bicycle lane; however, wider lanes are often necessary in locations with parking, curb and gutter, heavier and/or faster traffic. For more design guidance, see **Chapter 6, NMTP Design Guidelines**.

The fully integrated transportation infrastructure will improve conditions for all users because of state and local agencies' efforts to plan projects for the long term, address the need for bicyclists and pedestrians to cross corridors as well as travel along them, obtain approval for design exceptions at the highest senior staff level, and design facilities to the best currently available standards and guidelines.

Local Agency Actions

Some actions that agencies can take to demonstrate their commitment to the multifaceted USDOT approach include:

- Adopt new manuals, or amend existing manuals, covering the geometric design of streets, the development of roadside safety facilities, and design of bridges and their approaches so that they comprehensively address the development of bicycle and pedestrian facilities as an integral element of the design of all new and reconstructed roadways.
- Define the exceptional circumstances in which facilities for bicyclists and pedestrians will not be required in all transportation projects.
- Adopt stand-alone bicycle and pedestrian facility design manuals as an interim step towards the adoption of new typical sections or manuals covering the design of streets and highways.

¹ Design Guidance - Accommodating Bicycle and Pedestrian Travel: A Recommended Approach / A US DOT Policy statement Integrating Bicycle and Walking into Transportation Infrastructure, U.S. Department of Transportation – Federal Highways Administration, February 2000.

- Initiate an intensive re-tooling and re-education of transportation planners and engineers to make them conversant with the new information required to accommodate bicyclists and pedestrians. Training should be made available for, if not required of, agency traffic engineers and consultants who perform work in this field.

By taking the above actions, the City of Lakewood can avoid possible liability claims. The USDOT guidance on this issue is clear: Agencies should take steps to identify and evaluate risks and develop an effective risk management program. One risk that local government agencies can avoid involves signing sidewalks as bicycle paths. Such signage indicates that it is safe for bicyclists to ride there, but these facilities are not usually designed for pedestrians and bicyclists. In addition to steering clear of potential bicycle-pedestrian collisions, separate bicycle facilities are “operationally superior” to wide outside lanes.

In policy and in practice, USDOT has committed itself to supporting a completely mobile transportation infrastructure. Bicycles are increasingly used for everyday travel needs as well as for recreation and health benefits. Case law demonstrates that the judicial system is less likely to rule in favor of local jurisdictions that do not prepare and implement truly multi-modal plans, given the degree of research and planning that exists for bicycles. By paralleling USDOT’s commitment to planning for pedestrian and bicycle transportation, the City of Lakewood can help to build a transportation network that is more fully mobile for all travelers.

Washington State Policy

Much of Washington State policy regarding transportation planning is guided by the GMA. In 2005, the state amended the GMA² to encourage local governments to complete their NMTPs with comprehensive networks for pedestrian and bicycle travel. Specifically, the GMA amendments require communities to consider

urban planning approaches that promote physical activity and require that a bicycle and pedestrian component be included in the transportation element of comprehensive plans.

Examples of planning approaches promoting physical activity are: encouraging infill development, designating mixed-use community centers, and designating transit-oriented development (TOD) zones, among other things. Most relevant to transportation planners, the state suggests that agencies review local regulations to ensure that bicyclists and pedestrians are adequately planned for in street and subdivision development standards, parking standards, and parking lot design. Also, local governments should comply with the ADA not only to provide access for the disabled, but also for people with strollers and walkers. Ensuring that high quality bicycle and pedestrian facilities are available is important, as well as ensuring that people feel safe using them. “High quality” denotes several characteristics:

- A complete street network with multiple connections, accommodating multiple transportation modes and a grid street pattern. Block sizes of between 200 and 800 feet and maximum distances for intersections of between 500 feet (local streets) and 1000 feet (arterial streets) are elements of such a complete street network. Links between dead-end streets are also essential.
- Connectivity between trails, pathways, neighborhoods, schools, and sidewalks that enhances the ability for users to be physically active.
- Trails and linear parks that link activity centers and serve as recreation facilities and as transportation routes.
- Safety enhancements such as lighting, signage, more safe crossing opportunities, reduced vehicle speeds, and separated paths and trails.
- A consistent use of strategies such as crime prevention through environmental design (CPTED) in order to address users’ fears and perceptions of danger about walking and bicycling in the community. The use of CPTED includes a clear division between public and private space and passive surveillance of public areas that can improve safety. The

² Planning for Bicycling and Walking: 2005 Amendments to the Growth Management Act, August, 2005. Washington State Departments of (1) Transportation, (2) Health, and (3) Community, Trade and Economic Development.

cities of SeaTac, Everett, and Spokane have adopted CPTED principles.

Washington cities have been including bicycle and pedestrian components as parts of their comprehensive plans' transportation elements. By employing non-motorized policies consistent with new federal and state directives, the City of Lakewood will be more competitive for statewide and federal funding and will remain consistent with the GMA. Some strategies that can be used in NMTP components are:

- Retrofit existing streets with pedestrian and bicycle facilities.
- Designate and improve safe routes to school (already completed by Lakewood).
- Improve walking and bicycling conditions by improving connections from residential areas to health care facilities, community centers, shopping, transit, and other services. The improved connections would be enhanced by adding amenities such as shade trees, benches, and water fountains. It is also important to eliminate hazards to bicycle travel such as parallel bar drainage grates, traffic-actuated signals unresponsive to bicycles, and roadside debris along non-motorized routes of travel.
- Use traffic calming measures such as narrower road widths, traffic circles, speed humps, and other devices to slow traffic for safer pedestrian and bicycle use and create safer and more attractive streets.
- Enforce traffic laws and provide traffic safety education programs for drivers, pedestrians, and bicyclists.
- Use innovative, low-cost transportation demand management (TDM) strategies (e.g., employer-provided bus passes, facilities, and incentives) to help make bicycling, walking, transit, carpooling, and vanpooling more attractive commuting options. Washington's Commute Trip Reduction (CTR) Act requires certain jurisdictions to develop, adopt by ordinance, and implement a CTR plan for all major employers.

In addition to statewide multi-modal planning laws in the GMA and other parts of state law, the State of Washington has emphasized multi-modal planning³ in order to be more consistent with federal policy. WSDOT has been instrumental in this effort, particularly by laying out a Livable Communities Policy⁴. Transportation agencies have many options at their disposal to support and encourage livable communities. Some of these options are:

- Foster multi-modal transportation systems that enhance communities to encourage multi-modal access to transportation facilities; i.e., design and placement of facilities to provide for safety and access to services or jobs.
- Consider community and neighborhood connectivity when improving transportation corridors by providing bicycle and pedestrian networks.
- Ensure new or expanding transportation facilities are consistent with local land use and regional policies, plans and agreements.
- Develop collaborative transportation actions sensitive to community values to allow flexibility in design standards/procedures to adjust to local plans.
- Promote tools for livable communities such as model ordinances, codes, and regulations.
- Enhance community aesthetics with transportation facilities, incorporating unique local features (i.e., scenic views, community neighborhoods, historic districts, etc.) and providing focal points for communities through those facilities such as multi-modal stations, pedestrian plazas, and parkways.
- Coordinate access to funding to support local planning efforts.
- Fund (support) projects and efforts that enhance local livability.

³ Washington State Bicycle Transportation and Walkways Plan, Washington state Department of Transportation, September, 2005.

⁴ Livable Communities Policy, Washington state Department of Transportation, 2006.

- Support projects consistent with local plans.
- Encourage the use of funding resources like Transportation Enhancements and the National Scenic Byways program to support livable communities.
- Provide innovative financing tools which provide positive incentives to promote livable communities.
- Include livability criteria in funding of projects.
- Encourage funding partnerships by simplifying transportation and community infrastructure funding programs.

Washington State Bicycle Facilities and Pedestrians Walkways Plan March 2008-2027⁵

WSDOT has prepared its State Bicycle Facilities and Pedestrian Walkways Plan that summarizes a statewide goal with policies and performance measures. The plan considered the Governor's Executive Order [07-02] and emerging directives and initiatives addressing climate change and greenhouse gas emissions reduction. It includes the following 20-year goal, which is consistent with several local, regional and national plans:

- Double the percentage of total trips made primarily by bicycling and walking in Washington within the next 20 years; and
- Simultaneously reduce the number of bicyclists and pedestrians killed or injured in traffic crashes by 5 percent per year.

For successful implementation, the plan also includes a series of guiding non-motorized policies (with respective statewide performance measures), including:

Preservation - Ensure no net loss in pedestrian and bicycle safety, and mobility.

Safety - Target safety investments toward known risk factors for pedestrians and bicyclists.

Mobility – Increasing bicycling and pedestrian transportation choices.

Health and Environment - Increasing walking and bicycling will be part of Washington State's strategy to improve public health and address climate change.

Stewardship - Improve the quality of the transportation system by improving transportation access for all types of pedestrians and bicyclists, to the greatest extent possible.

An element of the plan includes recommended implementation measures or "steps" to be taken by Washington's cities and counties. For a variety of reasons it is important for the City of Lakewood to ensure that its NMTP is not only consistent but supportive of the Washington statewide plan. Consistency will help Lakewood in its future efforts seeking federal and state funding support for local non-motorized projects. **Table 5-1** summarizes some selected steps identified the state plan for implementation through Lakewood's NMTP.

⁵ Washington State Bicycle Facilities and Pedestrian Walkways Plan, Washington State Department of Transportation, 2008-2027.

Table 5-1. City of Lakewood NMTP – Implementing the Washington State Bicycle Facilities and Pedestrian Plan

Washington State Bicycle Facilities and Pedestrian Walkways Plan – Selected Implementation Steps	Lakewood NMTP Coordination and Implementation
WSDOT, regional and local agencies will address known risk locations on the roadway and bridge system to help ensure safe access by bicyclists and pedestrians.	See Pedestrian and Bicycle implementation strategies (below) – Chapter 5 – Lakewood Non-Motorized Policy Guide
WSDOT will partner with local agencies and developers to reduce short motor vehicle trips (both commute and non-commute trips) and related CO2 emissions by increasing biking and walking. In Washington State, over half of all trips are under three miles, yet 80 percent of these trips are made by car (National Household Travel Survey).	See Pedestrian and Bicycle policy discussion and objectives (below) – Chapter 5 – Lakewood Non-Motorized Policy Guide
WSDOT will initiate a new training program for all transportation engineers (state and local) focused on bicycle and pedestrian design and funding programs.	See “Next Steps” - Chapter 9 – Recommended Measures to Implement (Lakewood) NMTP
WSDOT will raise awareness of the importance of accessibility and design that strives to provide access to as many people as possible through training for state, regional, and local engineers, planners, and other transportation professionals and interested parties.	See NMTP Chapter 6 – Local Non-Motorized Design Guide supporting local design measures to improve non-motorized access and safety. See “ADA Coordinator” (NMTP Coordinator) staffing recommendation -Chapter 9 – Recommended Measures to Implement (Lakewood) NMTP
Ensure regional and local plans have measurable goals that will move toward accomplishing the state and federal goals.	See Pedestrian and Bicycle objectives (below) – Chapter 5 – Lakewood Non-Motorized Policy Guide
WSDOT will work with local agencies, transit providers, and developers to identify additional funding for projects not yet in design or construction to develop the entire project including elements addressing bicycle and pedestrian safety.	See NMTP Chapter 8 – Pedestrian and Bicycle System Plans – Pedestrian and Bicycle System Improvement Priorities

Greenhouse Gas Emissions Reduction – Emerging Washington State Policy⁶

In 2007, Governor Gregoire signed Executive Order 07-02 directing the Washington Department of Ecology (DOE) and Department of Community, Trade and Economic Development (CTED) to lead the Washington “Climate Challenge.” The Executive Order included goals to reduce greenhouse gas (GHG) emissions, create clean energy jobs and reduce expenditures on imported fuels. DOE and CTED formed the Washington Climate Advisory Team (CAT) to advise the state on a full range of policies and strategies to achieve specific goals in the Executive Order. The CAT included business, academic, tribal, government, religious and environmental leaders; and its recommendations were finalized in February 2008⁷.

The critical findings identified by the CAT relating to transportation are: (1) transportation is Washington’s largest contributor to GHG emissions; (2) growth patterns and long-term infrastructure choices that result in compact *walkable, bikable* and transit-friendly communities must be supported, funded and implemented; (3) without reductions in vehicle-miles traveled (VMT) by single-occupant vehicles (SOVs), Washington cannot meet its goals for emission reductions; and, (4) people will not (cannot) get out of their cars in sufficient number if they do not have viable options.

Further, the CAT concluded with two directional recommendations relating to *transportation* systems, designed to help achieve the GHG emission reduction goals:

- Build and continue to redesign communities that offer real and reliable alternatives to SOV use.
- Focus investments in Washington’s transportation infrastructure to prioritize moving people and goods cleanly and efficiently.

⁶ First Draft, Washington State Bicycle Facilities and Pedestrian Walkways Plan, Washington State Department of Transportation, March 2008.

⁷ Leading the Way: A Comprehensive Approach to Reducing Greenhouse Gases in Washington State: Recommendations of the Washington Climate Advisory Team. February 1, 2008.

As shown in **Figure 5-1**, non-motorized system infrastructure enhancements (statewide) alone will have relative little impact on emissions. However, non-motorized transportation is essential for the state and local jurisdictions in support of the major and most promising emission mitigation strategies, including:

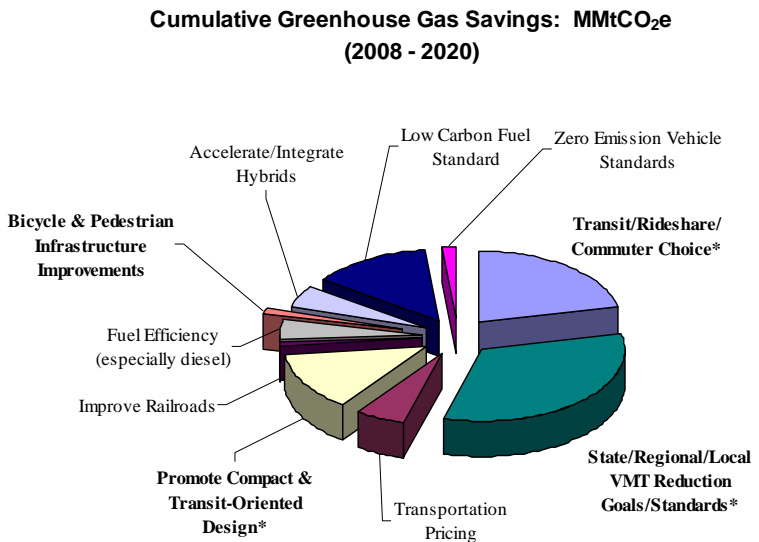
- Transit, ridesharing and commuter choice programs
- State, regional and local VMT reduction goals and standards
- Promotion of compact and transit-oriented development.

As contained in Chapter 8 of the NMTP, Lakewood has already prioritized its bicycle and pedestrian projects to fill critical system gaps, particularly in connection to (a) major land activity centers, (b) bus transit facilities, and (c) connections to the Lakewood Sounder commuter rail station.

In March 2008, Governor Gregoire signed climate change legislation (ESSHB 2815). The new law, based in part on the Governor's Executive Order 07-02, includes reduction goals for light duty vehicle per capita VMT of 18 percent by 2020, 30 percent by 2035, and 50 percent by 2050.

DOE has coordinated several implementation working groups (IWG) to implement the CAT recommendations. A Transportation IWG completed the identification of actions intent on reducing transportation-related GHG emissions. The Transportation IWG also identified and recommended tools and best practices to achieve VMT reduction goals and advance specific non-VMT transportation policy proposals for implementation, and possibly identify specific next steps (e.g revised taxing capabilities) given the need for a scalable, multi-pronged approach to address the climate impacts of the transportation sector. These policies were forwarded for consideration by the Governor and Legislature in the 2009 Legislative Session.

Figure 5-1. Greenhouse Gas Savings – Washington State Policy Options



MMtCO₂e = Million Metric Tons, Carbon Dioxide Equivalent

Source: Washington Climate Advisory Team, Leading the Way – A Comprehensive Approach to Reducing Greenhouse Gases in Washington State, 2008.

How does the Lakewood NMTP Integrate Emerging Statewide Policy on Greenhouse Gas Emission Reduction?

In the interim, and until specific policy and legislative action is taken, Lakewood's NMTP is already structured to implement policy and plan action consistent with and supporting the emerging statewide policies. **Table 5-2** summarizes the steps identified in Lakewood's NMTP to track and support the state's emerging greenhouse gas reduction initiatives relating to non-motorized policy strategies.

In coordination with Pierce Transit and Sound Transit, Lakewood has already undertaken local planning steps and adopted local ordinances consistent with emerging statewide policy to address key greenhouse gas mitigation strategies:

- Transit, ridesharing and commuter choice programs – coordination with Pierce Transit to revise local bus routing to better serve Lakewood’s Sounder commuter rail station once operational. City and Pierce Transit identified non-motorized railroad crossing enhancements with connectivity to Sounder station, yet unfunded (project included Chapter 8 – Pedestrian and Bicycle System Plan).
- State, regional and local VMT reduction goals and standards – additional localized modeling of Sounder station impacts, with revised local bus and non-motorized connectivity with transit overlay land use impacts to gauge localized VMT reduction.
- Promotion of compact and transit-oriented development – designated and adopted comprehensive plan policy⁸ and land development code⁹ to designate the Lakewood Station District and assign zoning that focuses transit-oriented land uses conducive to transit and non-motorized travel into the vicinity.

Mode-Share Policy Targets

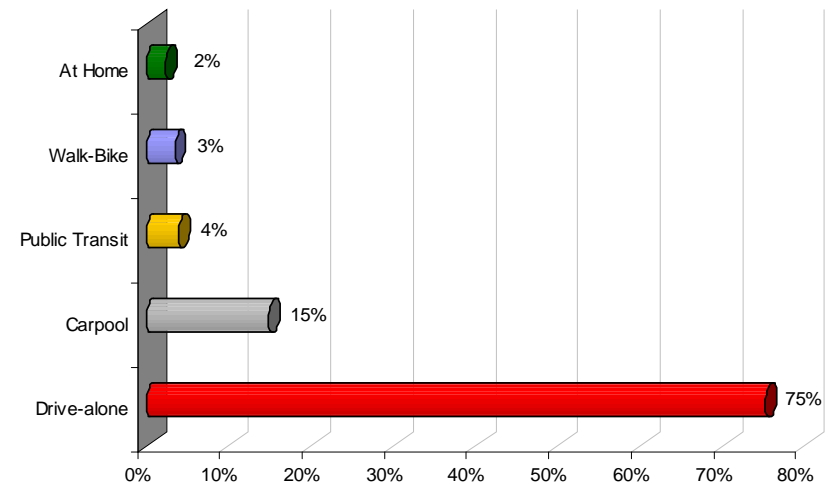
Comprehensive mode-share data for multiple trip purposes is not available for the Lakewood urban area specifically. General mode-share data for the Lakewood and larger Seattle-Tacoma urban area is summarized and provided by the Puget Sound Regional Council (PSRC) as part of its demographic and travel demand model programs, using data from the National Household Travel Survey (2001) and other sources. The NHTS summary for the larger urban area indicates that in the greater Puget Sound area, biking and walking account for nine percent of all trips; furthermore, half of all person trips are three miles long or less, and 80 percent of these are made by car – indicating a significant capacity for a shift toward non-motorized travel.

Specifically for Lakewood, the U.S. Census (2000) journey to work data summary indicate that Lakewood’s resident workers largely drive or are driven to work. As shown in **Figure 5-2**, the walk-bike

mode share for *worker commute* travel is three percent. Lakewood’s walk-bike mode share is roughly half of the countywide average (six percent). These data suggest that the City of Lakewood can make good progress in increasing walk-bike mode share through the implementation of the NMTP, in policy partnership with the state toward achieving statewide goals identified in the Draft Washington State Bicycle Facilities and Pedestrian Walkways Plan.

The City will need to coordinate with PSRC to help refine regional travel demand model steps and procedures to report non-motorized mode share and impact on VMT per capita reduction.

Figure 5-2. Lakewood Worker Commute Mode-Share



⁸ City of Lakewood Comprehensive Plan, Sections 3.3.5 and 4.5.2, 2000.

⁹ City of Lakewood Municipal Code 18A.30.510.

Table 5-2. City of Lakewood NMTP – Implementing the Emerging State Greenhouse Gas Policies

Bicycle and Pedestrian Infrastructure Improvements: Policy & Funding Initiatives (not yet State policy or statute)	Lakewood NMTP Coordination and Possible Implementation
City adopt a “Complete Streets” policy for local spending, with substantial incentive from state (e.g. state grants to local jurisdictions contingent on complete street policy).	Recommended revisions to street, sidewalk and bicycle facility designs contained in Chapter 6 of the NMTP will enhance non-motorized travel in Lakewood. Further street design and land development code enhancements, incorporated into a local “Complete Streets” design guide and policy may be beneficial to Lakewood.
In addition to ADA requirements, incorporate low-cost safety solutions to improve conditions for biking and walking as part of maintenance projects (e.g. paving projects).	Chapter 8, Pedestrian and Bicycle System Plans, of the NMTP includes \$0.9 million in bike lane and shared-lane street designations. Many of the street marking projects can be coordinated as part of the City’s regular maintenance programming.
State to increase funding available for bicycle and pedestrian projects and programs to \$150 million in the near term (as recommended in Washington’s Transportation Plan) and more in the long term, and expand the existing State Bicycle and Pedestrian Safety Program to include projects and programs that support mobility as well as safety.	Priority sidewalk and bicycle improvement projects identified in Chapter 8 total approximately \$30 million in need. Over 20-year plan period, a majority of which are new sidewalk construction projects; all of which are suitable for City action to apply for additional state funding support (when it becomes available).
State-supported new taxing authority and more flexibility with gas tax revenues to finance local, non-motorized projects. The goal would be provide sufficient funding for localities to build out their pedestrian and bicycle networks, invest in inviting streetscapes to accompany new development, and retrofit existing streets to prioritize transit, biking and walking. Similarly, local transit agencies should be granted additional voter-approved revenue sources.	Priority sidewalk and bicycle improvement projects identified in Chapter 8 total approximately \$30 million in need. Over 20-year plan period, a majority of which are new sidewalk construction project; all of which are suitable for City action to supplement revised state and local funding options under new and more flexible statutes.
State to provide policy support and planning grants to localities to develop plans and policies to encourage biking and walking, including public education, safety, engineering, and revisions to local land-use policies.	As the Lakewood NMTP is already drafted, additional state funding would support a local Lakewood “Complete Streets” design guide and policies.
State to support local governments, through grants and technical assistance, in identifying and studying the gaps in bicycle and pedestrian infrastructure and determining how these gaps can be best filled by street-related improvements as well as those associated with other public right-of-ways (e.g., parks, inter-street links, specialized structures). Supportive local land-use policies include requirements for shower and bike storage facilities in new buildings and design requirements to promote a pedestrian friendly environment.	Gaps in the Lakewood pedestrian and bicycle system identified in the NMTP. Additional state funding and support to Lakewood for local land use policy and regulation enhancements for building design, orientation, transit-oriented land uses that promote non-motorized travel.
State to require or encourage regional transportation planning organizations to quantify bicycle and walking mode share in order to allow tracking of progress of this mitigation option.	Ongoing coordination with PSRC and WSDOT will assist Lakewood in establishing mode share data baseline (for multiple trip purposes) and track future progress towards VMT reduction and non-motorized mode share increase over the NMTP planning horizon; to address mode share targets – see below.

Lakewood Comprehensive Plan – Policy Supplement

The NMTP includes additional goals, objectives and policies specific to non-motorized travel as a supplement to Lakewood's comprehensive plan. Adoption of the NMTP does not serve to directly modify the comprehensive plan, but policies set forth herein would be incorporated into a subsequent year's annual amendments following their adoption. Additionally, the policy framework included here does not directly align with the comprehensive plan's layout, so any subsequent modifications to the comprehensive plan would tailor the suggested NMTP policy framework for consistency with the overall comprehensive plan document.

Lakewood Pedestrian Plan Policy Framework

In developing a pedestrian system goal for the City, an emphasis was placed on the importance of providing connecting facilities. This can only be accomplished by building sidewalks where they are not currently in place. To provide this comprehensive network of well-maintained pedestrian facilities, the NMTP element of the comprehensive plan sets forth goals, objectives, and policies. This policy framework reflects the intent and requirement of the GMA, addresses the requirements of Title II of the ADA, and is inclusive of consistent policies and objectives found in the Draft Washington State Bicycle Facilities and Pedestrian Walkways Plan.

In order to achieve the pedestrian goal, three objectives have been outlined that deal with the role of creating pedestrian facilities:

- Create a comprehensive system of pedestrian facilities;
- increase the percentage of all trips made by pedestrians; and
- reduce the number of pedestrians injured in traffic accidents.

Each objective is to be met through the implementation of policies that pursue particular strategies, develop specified programs, or engage in defined courses of action to ensure the achievement of the goal and objectives established in the NMTP.

Goal, Objectives, and Policies

The City of Lakewood has the following goal, objectives, and policies for the planning, development, and operation of its pedestrian system:

GOAL: To provide a comprehensive system of connecting sidewalks and walkways that will encourage and increase safe pedestrian travel.

Objective No. 1

The City of Lakewood shall adopt and implement a "complete streets" policy, consistent with local policy adopted by Tacoma-Pierce County Board of Health for municipalities in Pierce County, as summarized in Appendix E.

Policy 1.1 Complete Streets

The safety and convenience of all users of the transportation system including pedestrians, bicyclists, transit users, freight, and motor vehicle drivers shall be accommodated and balanced in all types of transportation and development projects and through all phases of a project so that even the most vulnerable – children, elderly, and persons with disabilities – can travel safely within the public right of way.

Examples of how the complete streets policy may be implemented:

- Design and construct right-of-way improvements in compliance with ADA accessibility guidelines.
- Incorporate features that create a pedestrian friendly environment, such as
 - narrower traffic lanes
 - median refuges
 - curb extensions ("bulb-outs")
 - count-down pedestrian signals
- Improve pedestrian accommodation and safety at signalized intersections by:
 - using good geometric design to minimize crossing distances and increase visibility between pedestrians and motorists

- timing signals to minimize pedestrian delay & conflicts
- balancing competing needs of vehicular level of service and pedestrian safety (e.g., 2007 version of MUTCD to reduce design walking speed from 4 ft./sec. to 3.5 ft./sec.)
- Reclaim street space for other uses through the use of "road diets" (e.g., convert four-lane roadway to three-lane roadway with marked bike lanes).

Policy 1.2 Multi-Modal Concurrency Policy Procedures

As part of its comprehensive plan update, the City will evaluate, test and adopt appropriate revisions to its GMA and concurrency policy with respect to multi-modal (auto/truck, transit, bike and pedestrian) levels of service threshold standards and measurement tools.

Objective No. 2

The City of Lakewood shall create a comprehensive system of pedestrian facilities.

Policy 2.1 Inventory Existing System and Identify Needs

The City shall inventory and map existing pedestrian facilities. Facility inventories and selected inventory updates should be performed every five years to determine the success or failure of meeting the Plan's pedestrian goal, objectives, and policies. *[The City has already met this objective having completed the Self-Evaluation as part of the NMTP]*

Policy 2.2 Formalize New Sidewalk Construction Program

To complete the pedestrian facility network, the City will formalize a new sidewalk construction program that reflects the City's funding resources. This program will give priority to the construction of missing sidewalks in already developed areas of the city that would provide improved access to schools, parks, shopping, and transit services, reflective of the priorities in the NMTP to be implemented in regular updates of the six-year Transportation Improvement Plan (TIP).

Policy 2.3 Focus Attention on Inter-modal Connections

Sidewalks and walkways will complement access to transit stations/stops, train stations (future), and multiuse paths. Activity centers and business districts should focus attention on and encourage pedestrian travel within their proximity.

Policy 2.4 Ensuring Future Sidewalk Connections

All future development must include sidewalk and walkway construction as required by the Lakewood Municipal Code and adopted City of Lakewood design standards. All road construction or renovation projects shall include sidewalks. The City will support, as resources are available, projects that address identified barriers to pedestrian travel or safety.

Policy 2.5 Complete Connections with Crosswalks

All signalized intersections must have marked crosswalks. School crosswalks will be marked where crossing guards are provided. Marked crosswalks, along with safety enhancements (medians and curb extensions), shall be provided, as resources are available, at unsignalized intersections and uncontrolled traffic locations in order to provide greater mobility in areas frequently traveled by persons with limited pedestrian capabilities. Marked crosswalks may also be installed at other high volume pedestrian locations without medians or curb extensions if a traffic study shows there would be a benefit to those pedestrians.

Policy 2.6 Compliance with ADA Standards

The City shall comply with the requirements set forth in the ADA regarding the location and design of pedestrian facilities within the public right of way. See Appendix A summarizing Lakewood's Transition Plan addressing ADA Title II requirements for *pedestrian corridors*.

Objective No. 3

The City of Lakewood will seek to double the 2000 (U.S. Census) percentage of work trips made by pedestrians by the year 2025 (increase of walk-bike mode share from three to six percent).

Policy 3.1 Maintaining and Assuring the Quality of Facilities

The City will establish standards for the maintenance and safety of pedestrian facilities. These standards should include the removal of hazards and obstacles to pedestrian travel, as well as maintenance of benches and landscaping.

Policy 3.2 Promotion of Walking for Health and Community Livability

Consistent with the GMA, the City will encourage efforts that inform and promote the health, economic, and environmental benefits of walking for the individual and the community. Walking for travel and recreation should be encouraged to achieve a more healthful environment that reduces pollution and noise to foster a more livable community.

Policy 3.3 Connecting Pathway Network

The City will encourage the development of a connecting, multiuse trail network, using the Ft. Steilacoom Park shared-use path and proposed paths along Gravelly Lake Drive and other corridors such as utility easements.

Objective No. 4

The City of Lakewood will encourage education services and promote safe pedestrian travel in order to reduce the accident rates involving pedestrians.

Policy 4.1 Education of Pedestrian Safety Needs

The City shall encourage schools, safety organizations, and law enforcement agencies to provide information and instruction on pedestrian safety issues that focus on prevention of the most important accident problems. The programs will educate all roadway users of their privileges and responsibilities when driving, bicycling, and walking.

Policy 4.2 Taking Action to Improve Safety

The City must enforce pedestrian safety laws and regulations to help increase safety as measured by a reduction in accidents. Attention should be focused on areas where high volumes of automobile and pedestrian travel occur. Warnings and citations given to drivers and pedestrians should serve to impress the importance of safety issues.

Policy 4.3 Completion of Street Lighting Facilities

The City will work toward the completion of the street lighting system, designed to City illumination standards, on all designated arterials and collectors within the urban area. Through the use of neighborhood street lighting districts, property owners should be encouraged to provide street lighting, designed to City illumination standards, on all public local streets within the urban area.

Policy 4.4 Safe Access to Schools

The City will work with the Clover Park School District and neighborhood associations to maintain and improve its programs to evaluate the existing pedestrian access to local schools, estimate the current and potential use of walking as a travel mode, evaluate safety needs, and propose changes to increase the percentage of children and young adults safely using this mode.

Pedestrian Implementation Strategies

Sidewalk Construction

In implementing the NMTP pedestrian element, several methods of providing sidewalks are currently available to the City:

- Private development of properties and subdivisions. All new streets are required to have sidewalks. Most developing properties are required to construct sidewalks on abutting street frontages as part of the building permit process. The majority of new sidewalks are constructed in this manner.
- City-funded street improvement projects. The City will typically construct sidewalks as part of a street improvement project that brings a street up to urban standards.

- **Assessed projects.** An assessed project involves the direct financial participation of abutting or nearby property owners to fund the construction of public improvements. This is implemented through the creation of an assessment district called a local improvement district. Individual properties can also be assessed for the improvements required along their own frontage.
- **Inclusion in TIP.** The current Six-Year Transportation Improvement Plan should be updated with transportation system projects (sidewalk, multi-use path, bicycle lane and shared travel lane improvements) as prioritized in the NMTP. Lakewood's TIP can include specific pedestrian and bicycle improvements in ongoing programs: Bicycle and Pedestrian Improvements and ADA Compliance Sidewalk Repair and Rehabilitation.
- **State coordination.** Coordination with WSDOT is essential to assure that adequate pedestrian facilities are included in all WSDOT projects, particularly at freeway interchanges and overpasses and Amtrak crossings of local streets, including sufficient street lighting for non-motorized safety.

All five of these methods will be used by the City in differing situations to complete construction of the sidewalk system.

Safety and Maintenance

Safety is a primary concern for pedestrians who travel throughout their neighborhoods. In addition to providing sidewalks for pedestrians to walk on, the sidewalks need to be appropriately illuminated and adequately maintained. Property owners are required to maintain and repair the public sidewalks that abut their property.

Safe Pedestrian Crossings

By law, every intersection is a legal crosswalk, whether marked or not. Drivers are required to stop for pedestrians in any crosswalk, again, whether or not it is marked. Over the years, Lakewood has received some requests for marked crosswalks to improve safety. There are many studies that show marked crosswalks do not

improve safety for a pedestrian. In many instances, the markings actually decrease safety. Marked crosswalks are very visible to the pedestrian, but in most circumstances drivers do not see them very clearly. Pedestrians get a false sense of security, expecting the driver to react to the crosswalk when the driver is not even paying attention to it. Studies have shown that this is particularly true for the elderly and youth. Physical structures, such as curb extensions and medians, improve safety because they draw drivers' attention to that structure and to the pedestrian standing within the structure trying to cross the street.

The City's policy for marking crosswalks follows nationally recognized standards on installing traffic devices. The MUTCD, 2003 edition, controls how traffic control devices (including marked crosswalks) are used throughout the United States. Section 7C.03, Crosswalk Markings, states that, "Crosswalk lines should not be used indiscriminately. An engineering study should be performed before they are installed at locations away from traffic control signals or stop signs." As a guideline, the City will consider the City of Seattle's General Crosswalk Installation Guidelines¹⁰ as summarized here.

Marked pedestrian crosswalks may be used to delineate preferred pedestrian travel across roadways upon the City's evaluation of the following:

- a) At signalized locations where vehicular traffic might block pedestrian traffic when stopping for a red light;
- b) At non-signalized locations where recommended elementary school routes cross arterial and residential streets; and

¹⁰ City of Seattle, Department of Transportation Director's Rule 04-01 (12/31/2004), Installation Criteria & Procedures for Responding to Requests for Safety Improvements regarding: Marked Pedestrian Crosswalks; General Traffic Control Signals; Pedestrian Traffic Signals; Pedestrian Traffic Signals for the Disabled or Senior Citizens; and Pedestrian Traffic Signals to Accommodate School Crossings.

- c) At non-signalized locations where other students often cross; this includes junior high school, high school and private school students; and
- d) At non-signalized locations where, in the judgment of the City Engineer, the use of specially aligned crosswalks is desirable for traffic safety.

Further procedural, safety and design guidelines for crosswalk installation are provided in *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations*¹¹.

Street Lighting

Currently, all new public streets constructed in Lakewood require the installation of street lighting. Several options currently exist for property owners to have street lighting in place. Individual owners can pay to have a light in front of their property or, more frequently, a group of property owners form a street lighting district.

Lakewood Bicycle Plan Policy Framework

In developing the bicycle system goal for the City, an emphasis was placed on the importance of providing a completed system of direct on-street bicycle facilities and paths and on increasing the percentage of trips made by bicycle. Three objectives have been developed to help the City of Lakewood achieve its bicycle system goal:

- Creating a comprehensive system of bicycle facilities;
- Doubling the percentage of trips made by bicycle; and
- Reducing the number of bicyclists killed or injured in traffic crashes.

Each objective is to be met through the implementation of policies that pursue particular strategies, develop specified programs, or

engage in defined courses of action to ensure the achievement of the goal and objectives established in the NMTP. To increase the role of the bicycle as a viable mode of transportation, the City must provide connected and well-maintained facilities.

Goal, Objectives, and Policies

The City of Lakewood has the following goal, objectives, and policies for the planning, development, and operation of its bicycle system:

GOAL: To provide a comprehensive system of connecting and direct on-street bicycle facilities and shared-use paths that will encourage increased ridership and safe bicycle travel.

Objective No. 1

The City of Lakewood will create a comprehensive system of bicycle facilities.

Policy 1.1 Provide Bicycle Facilities on Arterial and Collector Streets

Bicycle lanes will be provided on all newly constructed arterial and collector streets. Arterial and collector streets undergoing overlays or reconstruction will either be restriped with bicycle lanes or shared-lane routes as designated on the Bicycle System Map (see Figure 8-2 in **Chapter 8**). Every effort will be made to retrofit existing arterials and collectors with bicycle lanes, as designated in Figure 8-2.

Policy 1.2 Mitigation of On-street Parking Loss From Bicycle Projects

Where new bicycle facilities require the removal of on-street parking spaces on existing roadways, parking facilities should be provided that mitigate, at a minimum, the existing on-street parking demand lost to the bike project. This policy does not apply to street widening or major reconstruction projects.

Policy 1.3 Connecting Pathway Network

The City will encourage the development of a connecting, multiuse trail network, using the Ft. Steilacoom Park shared-use path and

¹¹ Federal Highway Administration (FHWA), *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations, Final Report and Recommended Guidelines*, September 2005. Publication HRT-04-100.

proposed paths along Gravelly Lake Drive and other corridors such as utility easements.

Policy 1.4 Eliminate Barriers to Bicycle Travel

The City will actively pursue a comprehensive system of bicycle facilities through designing and constructing projects, as resources are available, and implementing standards and regulations designed to eliminate barriers to bicycle travel. As a result of this policy, new developments or major transportation projects will neither create new, nor maintain existing, barriers to bicycle travel. Through the implementation of development codes and standards, the City will require the creation of pathways and connections for bicyclists to schools, neighborhood shopping, and other activity centers. The City will adopt, include, and use bicycle supportive design and signage standards as part of roadway design standards, zoning and subdivision regulations, parking code requirements, railroad crossing standards, and other appropriate documents. As resources are available, the City will support projects designed to eliminate identified barriers relating to bicycle travel, either as stand-alone projects or as part of a major capital improvement project.

Policy 1.5 Bicycle Routes and Signage

As resources are available, the City will, in consultation with local bicyclists, review existing and proposed bicycle lanes and other streets, identify preferred routes, and make improvements as necessary to make these routes function better for bicyclists. These routes shall be identified by signage on the routes and shown on updates of the bicycle route map. See also **Chapter 7, Wayfinding**.

Objective No. 2

The City of Lakewood will seek to double the 2000 (U.S. Census) percentage of work trips made by pedestrians by the year 2025 (increase of walk-bike mode share from three to six percent).

Policy 2.1 Establish a Baseline of Bicycle Use

Upon adoption of the NMTP, the City will conduct the necessary research to establish a baseline of bicycle use for all trips. Necessary facility inventories and usage surveys will be performed

every five years to determine the success or failure of the plan's bicycle goal, objectives, and policies.

Policy 2.2 Complete the Major Bicycle System

Recognizing that a completed system of major bicycle facilities is one of the most important factors in encouraging bicycle travel, the City will work toward annually completing a minimum five percent addition to the bicycle system, as designated in Figure 8-2, with priority given to projects that fill critical missing links in the bicycle system or address an identified safety hazard.

Policy 2.3 Establish Minimum Standards for Bicycle Facility Maintenance

The City shall develop minimum standards that will keep bicycle facilities clean of debris, properly striped, and clearly marked and signed.

Policy 2.4 Develop a Maintenance Reporting Program

To assist the City in achieving a high standard of maintenance on existing bicycle facilities, a program should be developed that allows the public to identify repair, sweeping, and other maintenance needs.

Policy 2.5 Require Relevant Bicycle Accommodations During All Transportation Construction Projects

The City will require each urban street construction project within the city to include consideration of bicyclists in the traffic control plan, including placement of signs, routing, and lane width. High standards for resurfacing and sweeping will be required of all construction projects in the roadway right-of-way.

Policy 2.6 City Code Requirements for Bicycle Parking

The Lakewood Municipal Code will contain bicycle parking supply requirements and standards that require new developments to provide a minimum amount of bicycle parking, based on the needs of the specific zone or land use type.

Policy 2.7 Develop a Bicycle Parking Program for Businesses

To assist businesses desiring to install bicycle parking, standards and placement criteria will be developed for acceptable bicycle parking facilities. Annually, the City will provide a limited number of installed bicycle racks to existing businesses and agencies in commercial districts, by request, on a first come, first served basis.

Policy 2.8 Bicycle Parking at Transit and Inter-modal Facilities

The City will encourage the installation of public bicycle parking facilities at park-and-ride facilities, transit stations, bus terminals, and other inter-modal facilities, and continuation of bicycle rack provision on all public transit vehicles.

Policy 2.9 Promote Bicycle Use

The City will encourage bicycling by sponsoring or participating in activities that promote bicycle transportation and recreation.

Objective No. 3

The City will promote bicycle safety and seek to reduce the accident rate involving bicyclists.

Policy 3.1 Target and Eliminate Key Behaviors that Lead to Bicycle Accidents

The City will encourage schools, safety organizations, and law enforcement agencies to provide information and instruction on bicycle safety issues that focus on the most important accident problems.

Policy 3.2 Bicycle Safety Awareness Programs

The City will develop training and awareness programs that encourage the public to ride safely and use bicycle safety equipment when bicycling. These programs should encourage all roadway users to courteously share the road and be aware of their privileges and responsibilities when driving, bicycling, and walking.

Policy 3.3 Safe Access to Schools

The City will work with Clover Park School Districts and neighborhood associations to maintain and improve its programs to evaluate the existing bicycle access to local schools and supporting infrastructure at schools (bicycle racks, lockers, etc.), estimate the current and potential use of bicycling as a travel mode, evaluate safety needs, and propose changes to increase the percentage of children and young adults safely using this mode.

Bicycle Implementation Strategies

In implementing the NMTP element, several methods of providing bicycle facilities are currently available to the City:

- Inclusion in TIP. The Six-Year Transportation Improvement Plan should be updated with transportation system projects (sidewalk, shared-use path, bicycle lane and shared travel lane improvements) as prioritized in the NMTP. Lakewood's TIP should be amended to include specific bicycle improvements in a bicycle and pedestrian improvements program.
- State coordination. Coordination with WSDOT is essential to assure that adequate bicycle facilities are included in all WSDOT projects, particularly at freeway interchanges and overpasses and Amtrak crossings of local streets, including sufficient street lighting for non-motorized safety.
- Bicycle Storage. Establish a commuter bike facility (secure parking, showers, and changing rooms) and other bicycle amenities in the central business district.

Bicycle and Pedestrian Facilities Funding Opportunities

As the City of Lakewood implements the NMTP it will be best served by strategically pursuing state funding in support of priority pedestrian and bicycle projects. The State of Washington offers several grant programs for local governments to complete their

transportation systems by making bicycle and pedestrian facility improvements¹².

General Bicycle and Pedestrian Related Grants

Washington Wildlife and Recreation Program: The Interagency Committee for Outdoor Recreation (IAC) provides state funds for acquisition and development of local and state parks, water access sites, trails, critical wildlife habitat, natural areas, and urban wildlife habitat.

Small City Sidewalk Program: The Transportation Improvement Board provides state gas tax funds for pedestrian projects. These projects improve safety, provide access, and address system continuity and connectivity. The program is on an annual cycle.

Non-Highway and Off-Road Vehicle Program: WSDOT provides state funding to develop and manage recreation opportunities for those who use off-road vehicles (motorcycles, four-wheel drives, all-terrain vehicles). The program also supports facilities for those who pursue non-motorized trail activities, such as bicyclists, cross country skiers, equestrians, and hikers.

Transportation Enhancement Grants: WSDOT provides federal funding to transportation-related activities designed to strengthen the cultural, aesthetic and environmental aspects of the inter-modal transportation system. The program provides for the implementation of a variety of non-traditional projects, with examples ranging from the restoration of historic transportation facilities, to bike and pedestrian facilities, to landscaping and scenic beautification, and to the mitigation of water pollution from highway runoff.

National Recreational Trails Program: IAC provides federal funding to rehabilitate and maintain recreational trails and facilities that provide a backcountry experience. Eligible projects include maintenance of recreational trails, development of trail-side and trail-

head facilities, construction of new trails, operation of environmental education and trail safety programs.

Surface Transportation Program - Regional Funds: PSRC provides federal funding for projects on any Federal-aid highway, bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities. A portion of funds reserved for rural areas may be spent on rural minor collectors. Eligible projects include modifications of existing public sidewalks to comply with the requirements of the ADA.

Congestion Mitigation Air Quality Improvement Program: PSRC provides federal funds to projects and programs that reduce transportation related emissions in four air quality non-attainment and maintenance areas in the state.

Safety Related Grants

Safe Routes to Schools: WSDOT provides state and federal funding for the Safe Routes to School Program. The purpose of this program is to provide children a safe, healthy alternative to riding the bus or being driven to school.

Pedestrian and Bicycle Safety Program: The purpose of the WSDOT Pedestrian and Bicycle Safety program is to aid public agencies in funding cost-effective projects that improve bicycle and pedestrian improvements.

Traffic Safety Grants: The Washington Traffic Safety Commission provides state funding for programs, projects, services and strategies to reduce the number of deaths and serious injuries that result from traffic crashes. Funds may be used for pedestrian and bicycle improvements.

Hazard Elimination Safety Grants: WSDOT's Intersection and Corridor Safety Program provides federal funding to safety improvement projects that eliminate or reduce fatal or injury accidents by identifying and correcting hazardous locations, sections and/or elements. These include activities for resolving safety problems at hazardous locations and sections and roadway elements that constitute a danger to motorists, pedestrians, and/or bicyclists.

¹² For current deadlines, see "Funding for Bicycle and Pedestrian Facilities" at <<http://www.wsdot.wa.gov/bike/Funding.htm>>.



Non-Motorized Transportation Plan



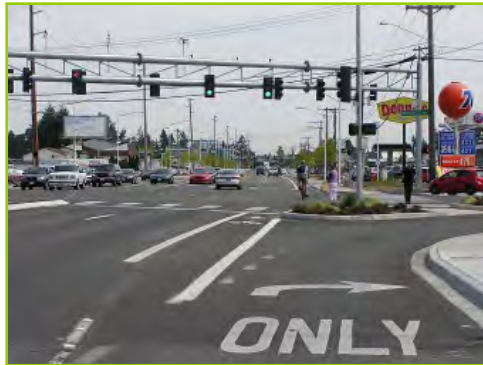
Chapter 6—Local Non-Motorized Design Guide

Introduction

Pedestrian System

Each day, nearly everyone in Lakewood is a pedestrian for at least some part of every trip. Yet within the last 20-30 years pedestrian travel has sometimes received secondary attention. Historically, a much greater emphasis has been placed on the planning and design of major streets and highways, with the primary focus on mobility and access for the automobiles and trucks.

Many American cities have undertaken significant efforts in revising their plans, policies and designs for more walkable communities, seeking greater balance for multi-modal use of the public streetscape. The City of Lakewood should consider more immediate refinements to its pedestrian design standards, to increase pedestrian accessibility and mobility needs and to comply with the ADAⁱ.



There are many opportunities to improve pedestrian conditions and in doing so, making Lakewood more walkable and livable. The purpose of the Local Non-Motorized Design Guide is to highlight significant local design features relative to the ADA requirements based on the premise that accessible design is the foundation for all good pedestrian system design.

The Local Non-Motorized Design Guide directly references and number of federal and professional sources for the full range of

pedestrian elements rather than develop a fully independent and comprehensive guide, including: FHWA's *Designing Sidewalks and Trails for Access*,ⁱⁱ AASHTO's *Guide for Pedestrian Facilities*,ⁱⁱⁱ and, FHWA's *Pedestrian Facility User's Guide*.^{iv} Detailed sidewalk, curb ramp, driveway crossing and trail design elements are provided in *Designing Sidewalks and Trails for Access*. The Local Non-Motorized Design Guide summarizes only those elements of the pedestrian system crucial to current planning, design and construction of critical pedestrian facilities in Lakewood.

Bicycle System

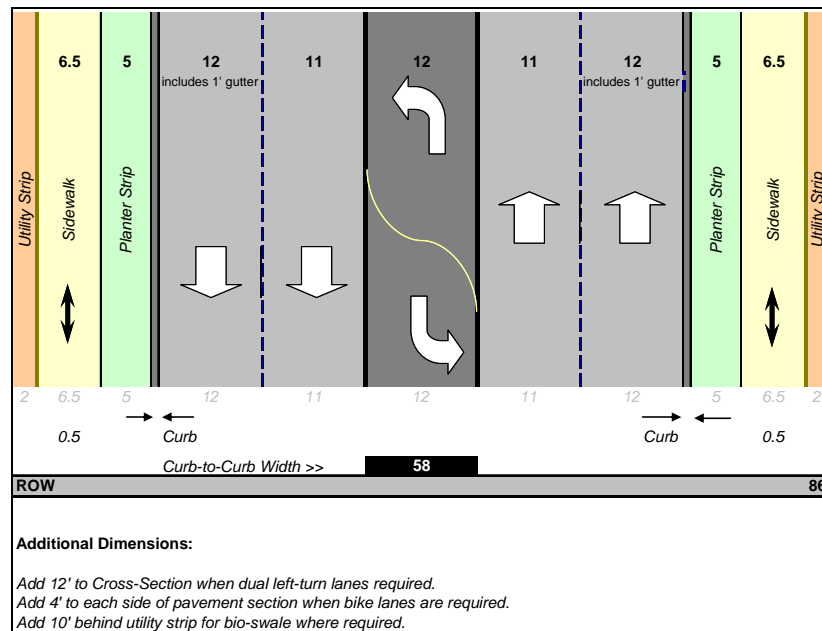
Similar design guidance is important for the consistent development of Lakewood's system of bicycle lanes and share-lane facilities. Significant guidance is provided at the federal and state level in assisting Lakewood in revisions for design guides to bicycle facilities, including: AASHTO's *Guide for the Development of Bicycle Facilities*,^v the *MUTCD*,^{vi} and WSDOT's *Design Manual*.^{vii} The cities of Chicago and San Francisco have also pioneered bicycle design work from which Lakewood can borrow important elements, particularly with regards to bicycle lane and shared travel lane facilities.

Pedestrian Design Guide

As part of the NMTP effort an examination of the City of Lakewood's draft (2007) street, sidewalk and curb ramp design standards was conducted, including a comparison of Lakewood's draft standards to the ADAAG^{viii}. Lakewood has adopted street standards and is administering these standards throughout the city as part of new street development.

Lakewood has been administering a series of designs for curb ramps and sidewalk construction. Along arterials the design most often constructed is a single, diagonal ramp with curbside sidewalks. The City's draft street standards include five-foot planter strips between the curb and sidewalk, as shown in **Figure 6-1**.

Figure 6-1. Lakewood Street Design Standard—Minor Arterial



The draft standard drawings for corner curb ramps include options for (a) a single, parallel ramp with curb-side sidewalks, and (b) perpendicular ramps matching draft street standards with planter strip. Historically, Lakewood has constructed diagonal ramps. Nationally, mobility-impaired pedestrians have stated concerns regarding diagonal ramps, in that the direction of travel is oriented by the diagonal ramp towards the center of the intersection rather than directly to the crosswalk. The combination of a single ramp and curbside sidewalks was also noted as a less desirable environment for pedestrians (of all kinds) crossing busy arterials. Application of the city's revised curb ramp designs under their draft standards will greatly improve access for the mobility-impaired.

The Lakewood Local Non-Motorized Design Guide focuses on each of these issues with separate sections for Sidewalk Corridors, Grade and Cross Slope, Driveway Crossings, Curb Ramps, Pedestrian Crossings and Other Design Features. For each element of the

pedestrian portion of the Design Guide a summary is provided, including:

- Americans with Disabilities Act Accessible Guidelines (ADAAG) regulations
- FHWA Designing Sidewalks and Trails for Access – Best Practices Design Guide (where applicable)
- ADAAG Draft Rule^{ix} (regulations that may be added or amended in the near future)
- Draft Lakewood Design Standards
- Recommended refinements to Draft Lakewood Design Standards

Sidewalk Corridor

The City of Lakewood might consider enhancing its street and sidewalk standards with more detailed emphasis on the pedestrian portion of the street corridor. The *Sidewalk Corridor* is defined as that portion of the pedestrian system from the edge of the roadway (back of curb) to the edge of the right-of-way, generally along the sides of streets, between street corners. For the purpose of the Lakewood Local Non-Motorized Design Guide, the width of the sidewalk corridor extends to the edge of the street or roadway, even if part of that area is not paved. Sidewalk corridors that promote access include the following characteristics:

- Wide pathways;
- Clearly defined pedestrian, furniture, and frontage zones;
- Minimal obstacles/protruding objects;
- Minimal walking distance;
- Moderate grades and cross slopes;
- Rest areas outside of pedestrian zone;
- Firm, stable, slip resistant surfaces; and
- Good lighting

Lakewood is also not the sole public agency responsible for the development and maintenance of these sidewalk corridor characteristics. The Washington State Department of Transportation shares in some jurisdictional responsibilities with Lakewood.

Highlighted elements of the sidewalk corridor included in the Design Guide are sidewalk widths, grades and slopes. Lakewood can directly reference Designing Sidewalks and Trails for Access as a design guide for other sidewalk corridor elements.

Pedestrian, Furniture and Frontage Zones

Historically, the absence of setback requirements has resulted in some installation of private vegetation and fencing immediately behind sidewalks, which results in a more confined public walking space. Many U.S. cities are adopting and implementing design standards for sidewalk corridor based on a zone system. Lakewood may wish to consider revising their design standards and land use codes and policies based on the zonal system, consistent with Designing Sidewalks and Trails for Access, and coordinating with local land use agencies for consistent application.

The zone system is used to determine the width of the sidewalk corridor and to ensure that obstacles, such as newspaper boxes or utility poles, will not limit pedestrian access. As shown in **Figure 6-2**, the four zones within the sidewalk corridor are typically:

- Curb zone
- Planter/furniture zone
- Pedestrian zone
- Frontage zone

The width of the sidewalk corridor is then determined primarily by the width of the planter/furniture, pedestrian, and frontage zones. The size of the curb zone is generally constant throughout a community. Taking into account the minimum width of each zone, at least 8 1/2 feet of right-of-way is allocated to the sidewalk corridor. However, additional space is often needed to accommodate items such as pedestrian crossings, on-street parking, street cafes, and high pedestrian volumes. **Table 6-1** contains suggestions for the minimum widths of each zone.

Figure 6-2. Pedestrian Zone System

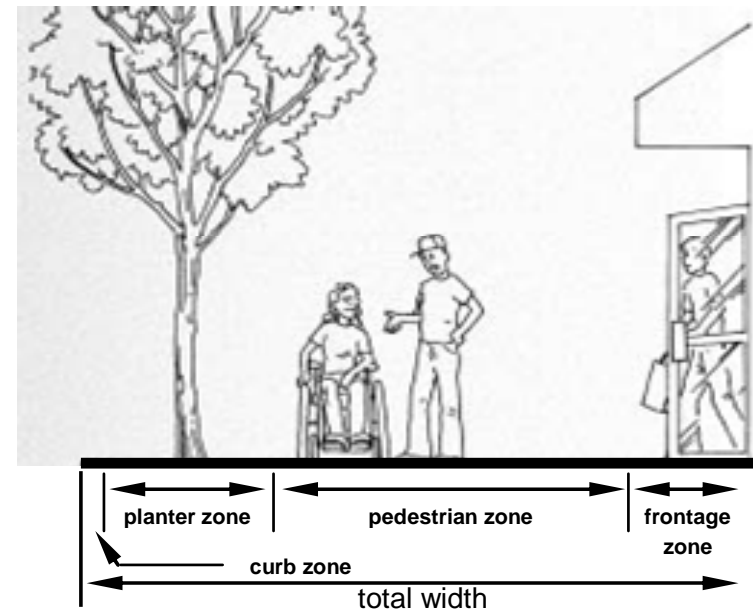


Table 6-1. Sidewalk Corridor Zone

Zone	Minimum Width
Curb Zone	6 inches (1/2 foot)
Planter/Furniture Zone	24 inches (2 feet) (6 feet if planting trees)
Pedestrian Zone	60 inches (5 feet)
Frontage Zone	30 inches*
Total Sidewalk Corridor	10 feet*

*If at least 2 1/2 feet of open space is available between the sidewalk corridor and the property line, no frontage zone is needed and the minimum recommended width for the sidewalk corridor is 7 1/2.

Sidewalk Width and Placement

The width of the sidewalk corridor is one of the most significant factors in determining the type of pedestrian experience that the sidewalk provides. The City of Lakewood's draft street standards are fairly consistent, with five-foot sidewalks, a five-foot planter strip and 1.5- or 2-foot utility strip along arterials, collectors and residential streets. These standards are sufficiently wide. The City may consider modifying its draft standards for street sections where significantly higher pedestrian travel would warrant a wider sidewalk, in most cases the planter strip area could be paved for a 10-foot sidewalk or wider.

The ADA is also specific to the effective clear width of sidewalks. A minimum of 3 feet of clear width has been the operating rule. However, as shown in **Table 6-2**, revised ADA policies are tending towards four feet of clear width along pedestrian access routes. The City's draft sidewalk detail standards include appropriate dimensions that enforce consistent, four-foot clear zones along the sidewalk corridor.

Sidewalk Grade and Cross Slopes

Grades and cross slopes are very difficult for some people with mobility impairments to negotiate because it is harder to travel across sloped surfaces than horizontal surfaces. People with mobility impairments who are ambulatory or use manual wheelchairs (see **Figure 6-3**) must exert significantly more energy than other pedestrians to traverse sloped surfaces. Powered wheelchairs are affected by the additional work required on steep grades because more battery power is used. This reduces the travel range of a powered chair. Both powered and manual wheelchairs can become unstable and/or difficult to control on sloped surfaces. Whenever possible, slopes should not be artificially created and should be minimized (to the extent possible) to improve access for people with mobility impairments. See **Table 6-3**.

Table 6-2. Sidewalk Width Regulations

ADAAG Regulations:

Clearances (Section 403.5) - *Clear Width* of walking surfaces shall be a minimum of 3 feet (36 inches), except as provided at turns and passing spaces.

Passing spaces - "An accessible route with a clear width less than 5 feet (60 inches) shall provide passing spaces at intervals of 200 feet maximum. Passing spaces shall be either: (a) a space 5 feet (60 inches) minimum by 5 feet (60 inches) minimum; or, (b) an intersection of two walking surfaces providing a t-shaped space where the base and arms of the t-shaped space extend **4 feet** (48 inches) minimum beyond the intersection.

FHWA Designing Sidewalks and Trails for Access:

Width - The pedestrian "zone" (sidewalk) should be at least 5 feet (60 inches) wide for two pedestrians to travel side by side without passing other pedestrians, or for two people going in opposite directions to pass one another.

The pedestrian zone should never be less than 3 feet (36 inches). This minimum width is only acceptable when: (1) A wider width is impossible; (2) The narrow width continues for as short a distance as possible; and, (3) Passing spaces are provided at intervals of no more than 200 feet.

ADAAG Draft Rule:

Clear Width - The minimum clear width of a pedestrian access route shall be **4 feet** (48 inches), exclusive of the width of the curb.

Lakewood Standard (Draft):

The *Sidewalk Detail Utility Pole and Sidewalk Detail Street Sign and Mailbox and Width* all illustrate four-foot clear zones along the sidewalk corridor.

Recommended Changes to Lakewood Draft Standard:

None.

Figure 6-3. Sidewalk Grade Impact

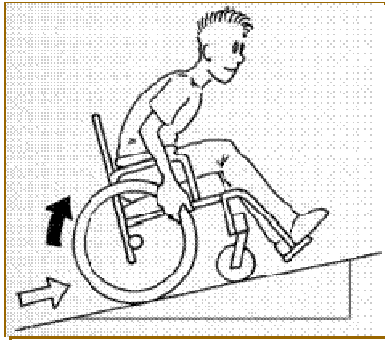


Table 6-3. Sidewalk Grade Regulations

ADAAG Regulations:

Slope - The running slope of walking surfaces shall not be steeper than 1:20 (5%). The cross slope of walking surfaces shall not be steeper than 1:48 (roughly 2%).

ADAAG Draft Rule:

Cross Slope - The cross slope of the pedestrian access route shall be 1:48 maximum.

Grade - The grade of the pedestrian access route within a sidewalk shall not exceed the grade established for the adjacent roadway. (EXCEPTION: The running slope of a pedestrian access route shall be permitted to be steeper than the grade of the adjacent roadway, provided that the pedestrian access route is less than 1:20)

Current Lakewood Draft Standard:

Draft standards for sidewalk sections indicate 2% cross-slope; draft standards are absent reference to any running slope or grade.

Recommended Changes to Lakewood Draft Standard:

Lakewood should consider modifying its draft standards to specify consistent grade as noted in ADAAG.

Driveway Crossings

Driveway crossings permit cars to cross the sidewalk and enter the street. They serve the same basic purpose for cars as curb ramps serve for pedestrians. Therefore, they consist of many of the same components found in curb ramps. It is the driver's responsibility to yield to the pedestrian at the driveway-sidewalk interface. Unfortunately, this does not always happen, and pedestrians are put at risk. Minimizing the number of driveway crossings in a sidewalk significantly improves pedestrian safety.

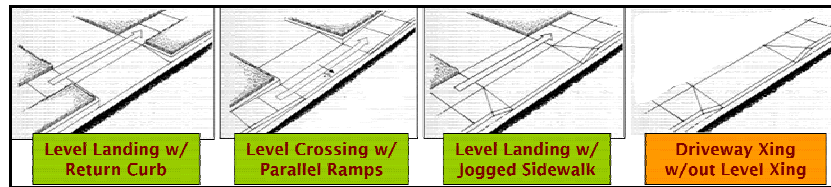
Driveway crossings should be designed so that both the pedestrians and the drivers are able to use them effectively. However, a driveway crossing must provide a way for cars to negotiate the elevation change between the street and the sidewalk. This is generally achieved by ramping all or a portion of the driveway crossing. When the ramp for the motorist crosses the pedestrian's path of travel, significant cross slopes and changes in cross slope must be negotiated by the pedestrian.

Change in Cross Slope

A change in cross slope is an abrupt difference between the cross slope of two adjacent surfaces. ADAAG does not permit cross slope to exceed 2 percent (changes in cross slope are allowed between 0-2 percent only). Changes in cross slope are commonly found at driveway crossings without level crossings. When considering the needs of pedestrians, change in cross slope is evaluated over a 2-foot interval, which represents the approximate length of a single walking pace and the base of support of assistive devices, such as wheelchairs or walkers. The design recommendations for change of cross slope specify the relationship between two adjacent surfaces, not the actual cross slope of either surface.

Figure 6-4 illustrates a number of driveway crossings, depicting those with and without level sidewalk landings. The City's draft driveway crossing standard includes level pedestrian surfaces with the required minimum cross-slope.

Figure 6-4. Driveway Crossing Types



Curb Ramps

For pedestrians of all types, the curb ramp is the immediate junction between the sidewalk and street crosswalk. It is no surprise, then, that a great deal of attention is paid to the planning and design of curb ramps. In general, curb ramps are most commonly found at intersections, but they may also be located at bus stops and mid-block (street) crossings. The implementing regulations under Title II of the ADA specifically identify curb ramps as requirements for existing facilities, as well as all new construction.

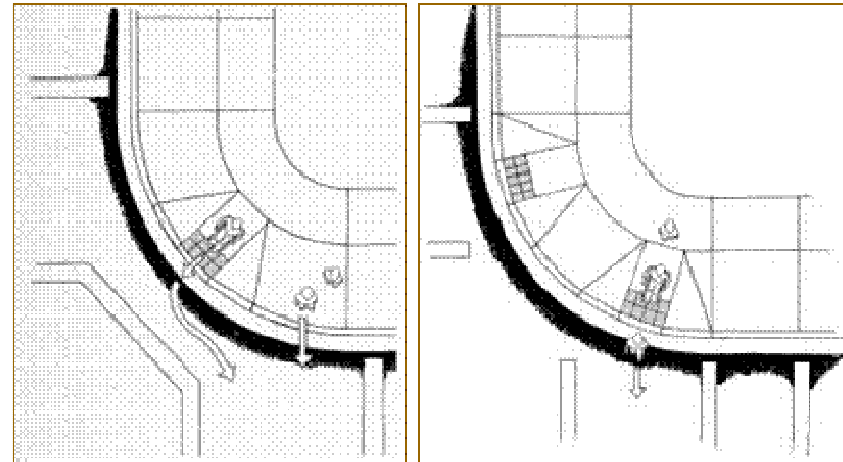
Curb ramp design issues vary from city to city and from subdivision to subdivision. This section provides some background information on curb ramps, user needs, and what can be done to meet ADA conformity by revisions to current curb ramp designs.

Mobility-Impaired Users

As noted by FHWA, curb ramps are designed to provide access to people who use wheeled forms of mobility. Without curb ramps, people who use wheelchairs would not be able to independently access the sidewalk and street.

Not all wheelchairs are similar in design and function, nor are all mobility-impaired pedestrians equally mobile. In fact, not all mobility-impaired pedestrians require a curb ramp. So, “a one-size fits all” curb ramp design is difficult to develop, as illustrated in **Figure 6-5**.

Figure 6-5. Types of Curb Ramp Designs



Vision-Impaired Users

For vision-impaired pedestrians, the curb is the most reliable cue to identify the transition between the sidewalk and the street. Most, if not all, curb ramps remove this cue. The physical ramp itself becomes more of a barrier to some vision-impaired walkers. Curb ramps are more difficult to detect by the range of vision-impaired. The combination of curb ramps and placement of truncated domes can, if done improperly, cause greater confusion to vision-impaired pedestrians seeking direction to cross busy streets.

Ideal Design Characteristics

FHWA's *Designing Sidewalks and Trails for Access* identifies a number of curb ramp designs that make the best accessible connection between the sidewalk and the street – for the full range of pedestrian users. To maximize accessibility and safety for all pedestrians, particularly when retrofitting existing curb ramps, curb ramp designs should attempt to meet all of the best practices for curb ramp design shown in **Table 6-4**. Depending on site constraints, it may not be possible to incorporate all of the best practices within each curb ramp.

Curb Ramp Types

Curb ramps are usually categorized by their structural design and how it is positioned relative to the sidewalk or street. The structure of a curb ramp is determined by how the components, such as ramps and flares, are assembled. The type of curb ramp and the installation site will determine its accessibility and safety for pedestrians with and without disabilities. As shown in **Figure 6-6**, the following types of curb ramps are most typical:

- Perpendicular curb ramps
- Diagonal curb ramps
- Parallel curb ramps
- Combination curb ramps
- Built-up curb ramps
- Curb extension

ADAAG has specifically addressed minimum standards for curb ramp components. In some cases FHWA has provided greater detail on recommended curb ramp designs, as summarized in Table 6-4. Where there are differences between ADAAG and FHWA's *Designing Sidewalks and Trails for Access*, it is recommended that Lakewood follow the FHWA guidelines for ADA compliance.

Lakewood's draft curb ramp standards were evaluated in comparison FHWA's *Designing Sidewalks and Trails for Access* to address each of the following components:

Curb Ramp Grade – ADAAG permits curb ramp slopes of 8.33% for new construction. FHWA recommends 7.1% to allow for construction tolerances. For retrofits where 8.3% ramp slopes cannot be attained, FHWA specifies the following ADAAG (1991) exceptions (not to be used for new construction):

- A slope between 8.33% and 10% is permitted for a maximum rise of 6 inches.
- A slope between 10% and 12.5% is permitted for a maximum rise of 3 inches.
- A slope steeper than 12.5% should be avoided regardless of length of ramp.

Ramp Cross Slope – Ramp cross slopes should not exceed 2.0%.

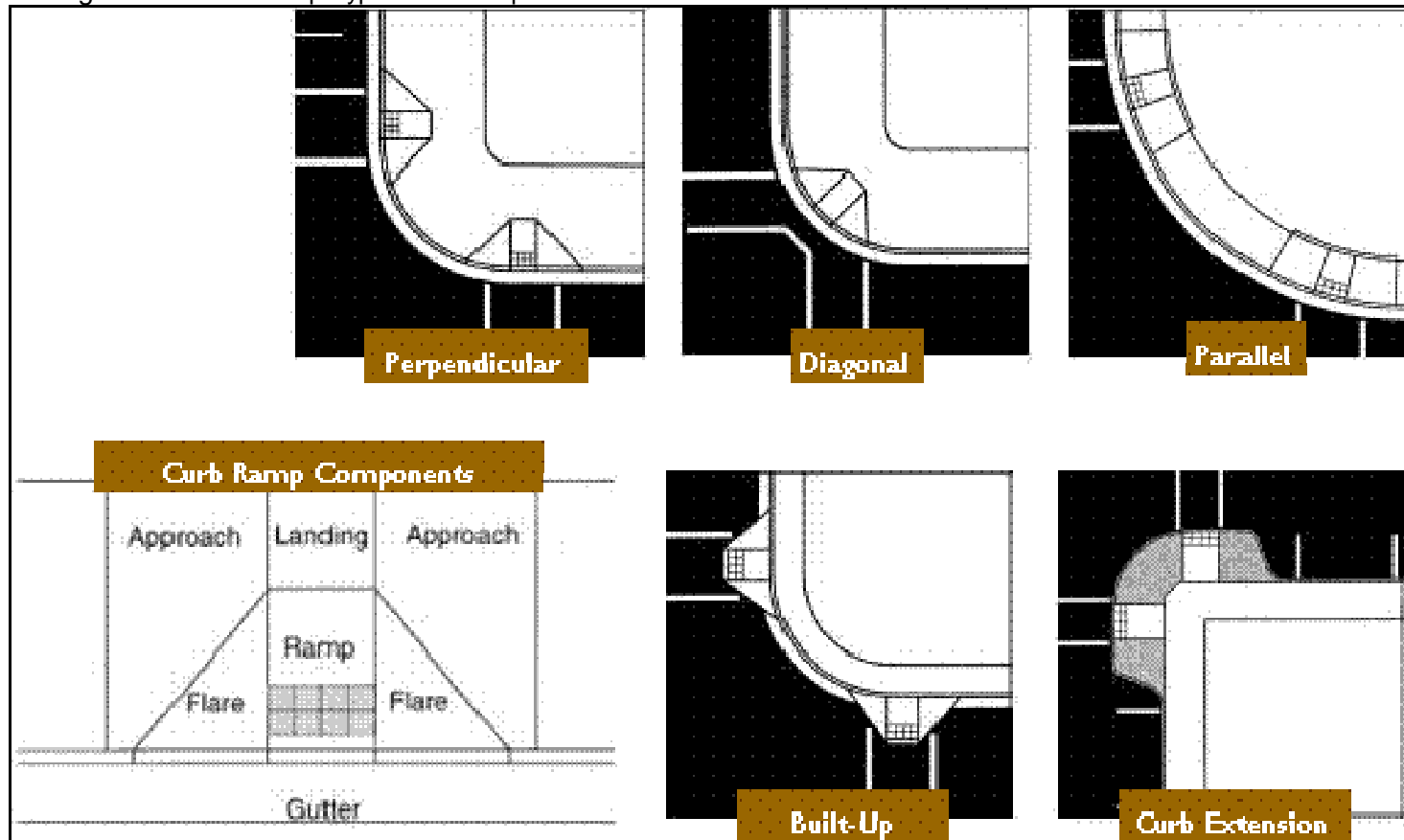
Ramp Length – See FHWA *Designing Sidewalks and Trails for Access*, (Table 7-3).

Ramp Width – Recommended width is 4 feet (48 inches), but should never be less than 3 feet (36 inches).

Table 6-4. Curb Ramp Design Best Practices

Best Practice	Rationale
Provide a level maneuvering area or landing at the top of the curb ramp	Landings are critical to allow wheelchair users space to maneuver on or off of the ramp. Furthermore, people who are continuing along the sidewalk will not have to negotiate a surface with a changing grade or cross slope.
Clearly identify the boundary between the bottom of the curb ramp and the street with a detectable warning.	Without a detectable warning, people with vision impairments may not be able to identify the boundary between the sidewalk and the street.
Design ramp grades that are perpendicular to the curb.	Assistive devices for mobility are unstable if one side of the device is lower than the other or if the full base of support (e.g., all four wheels on a wheelchair) is not in contact with the surface. This commonly occurs when the bottom of a curb ramp is not perpendicular to the curb.
Place the curb ramp within the marked crosswalk area.	Pedestrians outside of the marked crosswalk are less likely to be seen by drivers because they are not in an expected location.
Avoid changes of grade that exceed 11 percent over a 610 mm (24 in) interval.	Severe or sudden grade changes may not provide sufficient clearance for the frame of the wheelchair causing the user to tip forward or backward.
Design the ramp that doesn't require turning or maneuvering on the ramp surface.	Maneuvering on a steep grade can be very hazardous for people with mobility impairments.
Provide a curb ramp grade that can be easily distinguished from surrounding terrain; otherwise, use detectable warnings.	Gradual slopes make it difficult for people with vision impairments to detect the presence of a curb ramp.
Design the ramp with a grade of 7.1 ± 1.2 percent. [Do not exceed 8.33 percent (1:12).]	Shallow grades are difficult for people with vision impairments to detect but steep grades are difficult for those using assistive devices for mobility.
Design the ramp and gutter with a cross slope of 2.0 percent.	Ramps should have minimal cross slope so users do not have to negotiate a steep grade and cross slope simultaneously.
Provide adequate drainage to prevent the accumulation of water or debris on or at the bottom of the ramp.	Water, ice, or debris accumulation will decrease the slip resistance of the curb ramp surface.
Transitions from ramps to gutter and streets should be flush and free of level changes.	Maneuvering over any vertical rise such as lips and defects can cause wheelchair users to propel forward when wheels hit this barrier.
Align the curb ramp with the crosswalk, so there is a straight path of travel from the top of the ramp to the center of the roadway to the curb ramp on the other side.	Where curb ramps can be ahead, people using wheelchairs often build up momentum in the crosswalk in order to get up the curb ramp grade (i.e., they "take a run at it"). This alignment may be useful for people with vision impairments.
Provide clearly defined and easily identified edges or transitions on both sides of the ramp to contrast with sidewalk.	Clearly defined edges assist users with vision impairments to identify the presence of the ramp when it is approached from the side.

Figure 6-6. Curb Ramp Types and Components



Gutter Slope – Drainage slopes should not exceed 2%. On most curb ramps, to avoid rapidly changing grades, the cross slope of the street and gutter approach should not exceed 5%.

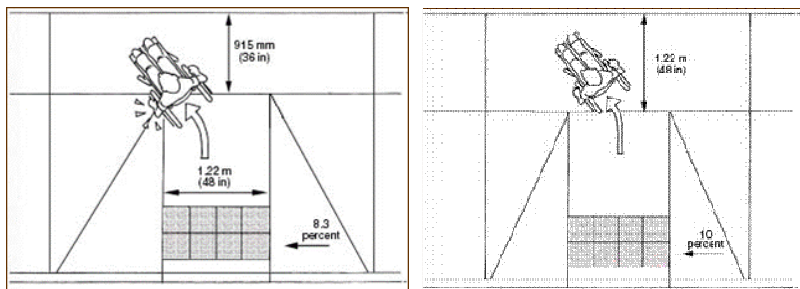
Change of Grade – Transition areas should have a minimum grade change (less than 11%) for a gradual transition for wheelchair users.

Sidewalk Approach Width – Sidewalk approaches should have a minimum, 3-foot (36-inch) clear space, free of obstacles.

Landing Dimension and Slope – Slopes of a landing should not exceed 2%. As shown in **Figure 6-7**, landings should extend at least 4 feet (48 inches) beyond the top of the curb ramp for maneuverability. If the space is limited and a 4-foot landing cannot be provided, an absolute minimum, 3-foot (36-inch) landing is acceptable, coupled with a minimum ramp width of 4 feet (48 inches) and ramp flare slopes not to exceed 8.3%.

The City's draft curb ramp standards appear to meet all of the FHWA thresholds, however, gutter slope details were not reviewed.

Figure 6-7. Curb Ramp Landings Are Critical



The relationship between curb ramps and street design is discussed further in the following section — *Pedestrian Crossings*.

Pedestrian Crossings

In *Designing Sidewalks and Trials for Access*, FHWA fully defines pedestrian crossings as *any location where the pedestrian leaves the sidewalk and enters the roadway*. At a pedestrian crossing, the pedestrian's path of travel crosses the motorist's path of travel. Pedestrian crossings include (a) mid-block crossings and (b) street intersections. At mid-block crossings, pedestrians generally encounter traffic moving in two directions. At street intersections, particularly those controlled with traffic signals, traffic is usually moving in multiple directions because of turning vehicles.

A considerable portion of *Designing Sidewalks and Trials for Access* is summarized here regarding pedestrian crossings at street intersections, to address emerging issues as Lakewood experiences further growth: *how to design arterial street intersections to balance the needs of drivers and pedestrians*.

Possible Design Solutions at Wide Intersections

The City of Lakewood can apply a number of techniques to improve pedestrian conditions and access at wide intersections where appropriate right-of-way exists, including:

- Install center medians to provide a refuge for slower pedestrians;
- Install accessible pedestrian signals to assist in providing people with vision impairments enough time to cross the street;
- Increase crossing times so that people who walk slowly will have sufficient time to cross before the signal indication changes;
- Increase the crossing times so that people who delay the start of their crossing to confirm the WALK interval will have sufficient time to cross before the signal indication changes;
- Restrict right turns on red;
- Enhance the visibility of the crosswalk markings or consider a raised crosswalk with detectable warnings (truncated domes) at both ends;
- Reduce crossing distances and increase visibility through the construction of curb extensions;

- Reduce excessive traffic speed;
- Clarify the pedestrian crossing area by installing stamped or raised crosswalks with detectable warnings (truncated domes) installed at both ends;
- Provide pedestrian lead time and an accessible pedestrian signal so pedestrians, including those with vision impairments, can assert themselves in the crosswalk before motorists start making right and left turns;
- Provide mid-block signalized crossing with accessible pedestrian signal opportunities at busy intersections to encourage people to cross where there are fewer potential points of conflict between pedestrians and motorists;
- Provide a curb extension to decrease crossing distances and increase pedestrian visibility; and
- Add traffic and pedestrian signal indications if they do not already exist.

Turning Radius

Designing intersections with smaller turning radii slows traffic speeds and allows perpendicular curb ramps to be positioned parallel to the crosswalk path of travel, as well as perpendicular to the curb. In addition, smaller turning radii significantly decrease crossing distances for pedestrians. Smaller radii also enhance detection of the crosswalk and improve crossing conditions for people with vision impairments because there is a greater distinction between the perpendicular and parallel traffic flows.

Pedestrian access is significantly compromised at intersections with larger turning radii, for the following reasons:

- Cars can make right turns at higher speeds;
- Curb ramp designs are often compromised;
- Pedestrian crossing distances are increased (this also results in increased vehicle signal phasing delays and reduced roadway capacity from the delays);
- Less space is available on the corner for pedestrians to collect;
- Less space is available on the corner for utilities;

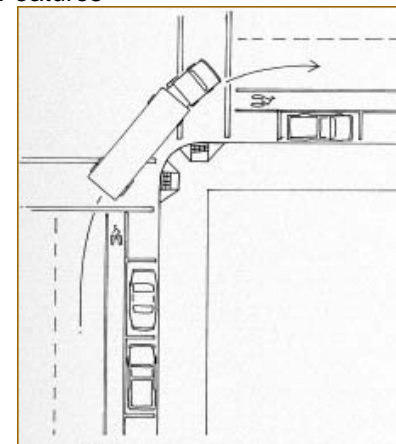
- It is more difficult for pedestrians, especially those with vision impairments, to claim the right of way when crossing;
- Greater numbers of conflicts arise between pedestrians and motorists; and
- Pedestrians are located outside of a driver's line of vision.

Appropriate driver sight lines at street intersections are important for pedestrian safety. Street design and surrounding land use patterns vary significantly within the City of Lakewood and can greatly affect the prevailing sight lines.

Intersection Design Issues for Further Consideration

The design speed of arterial streets greatly affects the design requirements of intersection corner radii. The City's draft standards, although they include pedestrian zone planter strips, remain essentially oriented to auto and truck mobility. These designs can affect the type of sidewalk approaches and curb ramps to accommodate intersecting pedestrians. As illustrated in **Figure 6-8**, by reducing the intersection corner radii for some arterials (arterial design speed), Lakewood may better accommodate pedestrians of all types by including mandatory on-street bicycle lanes that add turning space for larger vehicles in lieu of wider curb radii.

Figure 6-8. Design Speed and Corner Radii Affect Pedestrian Features



Transit Stops

Inadequate facilities for transit access can be a major challenge for pedestrians in Lakewood. The City of Lakewood should be proactive in partnering with Pierce Transit in the development and installation of accessible bus stop zones for the safe and efficient pedestrian access to transit along major city streets. Bus stop improvements should be considered by the City and Pierce Transit as part of all major development review projects. The following bus stop criteria should be included as part of these design reviews for accessible bus stop zones:

- Accessible Bus Stop Zone – 5' x 8' level landing area - for customers to safely wait for, board and alight the bus
- An area for a bus to safely serve the bus stop on or off the roadway.
- An easily identifiable Pierce Transit bus stop sign/flag.
- An accessible pathway around the bus stop or shelter of at least 4 feet.
- An accessible pedestrian path from the bus to the waiting area.
- Bus Stop Pad – 10' x 10' (dual purpose as interim boarding zone, upgradeable to include future bus shelter installation)

Pierce Transit provides design guidance for bus stops as part of their Bus Stop Manual⁸. Example design guides for bus stop benches and shelters are included in the Bus Stop Manual and highlighted in **Appendix D**, with guidance on far-side and near-side bus stops, and whether bus pullouts are needed in certain settings. A summary of each is provided here as they pertain to Lakewood.



Far-Side Stops/Zones

A far-side stop/zone is immediately following an intersection. Far-side stops/zones are the preferred location of Pierce Transit bus stops and are specifically recommended when:

- a. The intersection is controlled by signals, stop signs or yield signs.
- b. Traffic is heavier on the near side than on the far side of the intersection.
- c. A large number of left or right turns occur.
- d. Heavy traffic movements might cause delays in bus schedule.
- e. Pedestrian access and existing landing area are better on the far side than the near side.

Near-Side Stops/Zones

A near-side stop zone is one that is located immediately before an intersection.

Near-side stops are less desirable and should be used when:

- a. There are no far-side options.
- b. The intersection is controlled by signals, stop signs or yield signs, when transit operations are more critical than traffic or parking.
- c. Traffic is heavier on the far-side than on the nearside of the intersection.
- d. Pedestrian access and existing boarding area are better on the near-side than the far-side.

On Street Parking

Bus zone locations are dictated by road conditions and parking arrangements. In general, Pierce Transit prefers not to use pullouts unless required by law or jurisdiction. Generally speaking, it takes more time to serve a pullout than by staying in the lane of travel. The bus may get trapped as cars queue at a traffic signal and fail to yield to the bus as it attempts to re-enter traffic.

Other Pedestrian Design Features

The City of Lakewood should be proactive in the research and application of other design features that assist pedestrians. Major design features included in the Local Design Guide are audible signals to assist blind walkers at major, signalized street intersections—particularly those with complex crossings and configuration.

Audible Signals

Pedestrian signal indications are special types of traffic signals that are used to control pedestrian traffic patterns and movements. They consist of a series of signals to indicate:

WALK interval - the interval designated for pedestrians to cross;

Clearance interval - the interval designated for pedestrians who are already crossing to complete their crossing. Pedestrians at corners should not start a new crossing; and

DON'T WALK interval - the interval when pedestrians are not permitted to cross.

At many signalized intersections, the vision-impaired pedestrian relies on sounds of nearby, parallel traffic to indicate when the traffic signal WALK interval is indicated. At low volume intersections this method can be unreliable. Unreliable auditory cues, proportionately higher turn-volumes and complex pedestrian crossings can, by themselves or all together, cause the vision-impaired pedestrian to misjudge the signal WALK interval, leading to potentially unsafe conditions.

The implementing regulation under Title II of the Americans with Disabilities Act requires that all facilities constructed or altered after January 26, 1992 be designed and constructed to be accessible to people with disabilities (U.S. Department of Justice, 1991a). Therefore, all newly installed pedestrian signals should have accessible design features.

In addition to including accessible pedestrian signals in all new construction, it is also recommended that existing signal devices that are not accessible be prioritized for replacement. The priorities for determining where existing pedestrian signals should be improved include:

- Complex or irregularly shaped intersections;
- Intersections experiencing high volumes of turning traffic;
- Signalized intersections where traffic sounds are sporadic or masked by ambient noise;

- Intersections that have vehicular actuation of the traffic signals;
- Intersections with complex signal phasing;
- Major corridors leading to areas of fundamental importance such as post offices, courthouses, and hospitals;
- Exclusive pedestrian phase areas, such as motorists stopped in all directions; and
- Locations requested by people with vision impairments.

However, there has been considerable national and regional discussion and disagreement over the use of audible pedestrian signals by the two main consumer groups:

- American Council of the Blind (ACB) supported use of audible pedestrian signals; and,
- National Federation of the Blind (NFB) opposed all use of them.

Other Pedestrian Information Techniques

In addition to audible signals there are several pedestrian information techniques the City of Lakewood can provide for the mobility- and vision-impaired. These include:

- Vibro-tactile signal devices,
- Intersection (crosswalk) guide strips,
- Wayfinding directional tiles, and
- Informational signing

The City of Lakewood should coordinate with the vision-impaired community (see Chapter 9), to the extent there is local need, and consider on-going research^{xi} of audible signal design and implementation and other pedestrian information techniques.

If there is a stated need, the City should then establish priorities consistent with *Designing Sidewalks and Trails for Access*, and prepare specific project plans for the installation of pedestrian information and audible signals at critical locations in Lakewood. The City should then revise its traffic signal designs to accommodate

the necessary audible signal equipment and application as part of new traffic signal construction.

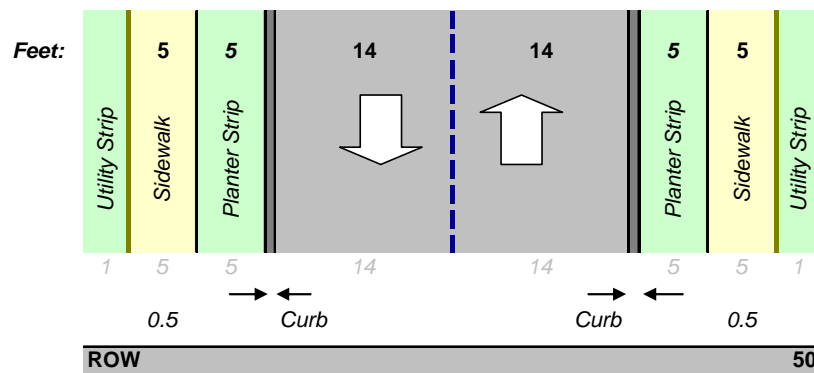
Optional Sidewalk Designs On Local Streets In Established Neighborhoods

In established residential areas many of Lakewood's local streets lack curb, gutter and sidewalk facilities. Adding sidewalks to these streets, if so desired by homeowners, immediately raises issues of storm drain design. Given right-of-way and cost constraints, homeowners may desire a single sidewalk rather than sidewalks on both sides of the street. The City can apply its current design standards. Further evaluation of recent design development and application completed by the City of Seattle may prove a meaningful option for Lakewood's consideration. The two options are illustrated below.

Option #1: Current Local Street Design Standard: Curb, Gutter & Curbside Sidewalk

The city's current design standard is a curb, gutter and sidewalk cross-section as shown in **Figure 6-9**.

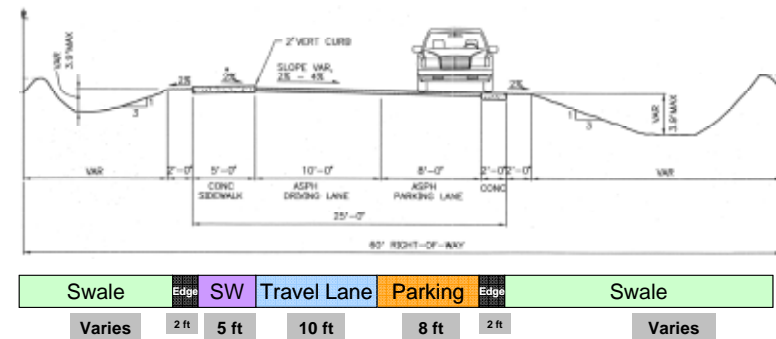
Figure 6-9. Lakewood Current Local Street Design Standard



Option #2: Seattle's SEA Street Model

As shown in **Figure 6-10**, the City of Seattle redesigned a residential street without curb and gutter and constructed a sidewalk separated from the street edge. By design pedestrians are provided a five-foot, concrete sidewalk edging the pavement on one side of the street experience is intended to be more pleasant by plantings that separate the sidewalk from the street, as well as the addition of a drainage system in a swale on the opposite side of the street (rather than a traditional curb and gutter configuration). Seattle had estimated that the alternative design was found to be cheaper, when considering a variety of street improvement elements, including drainage system requirements.

Figure 6-10. Seattle's SEA Street Design Option



A summary of the pros and cons of Seattle SEA street design was generally made as part of the NMTP effort and is summarized in **Figure 6-11**. There is merit to testing the application of a similar SEA Street design in Lakewood.

Figure 6-11. Pros and Cons of Seattle SEA Streets

PROS	CONS
<ul style="list-style-type: none"> May be cheaper than traditional curb/gutter/sidewalk design standard to construct SEA Cost Estimate per city block: <ul style="list-style-type: none"> \$325,000 SEA St. Design \$425,000 Traditional Design May be viewed having higher neighborhood aesthetics May require less off-site stormwater retention and treatment 	<ul style="list-style-type: none"> Requires adoption and application of new residential street design standards Cost of design not factored in to SEA estimates Requires seasonal maintenance, either by: <ul style="list-style-type: none"> formal agreement with individual property owners; or by additional program, revenue source and budget Likely requires similar funding enhancements through LIDs

Bicycle Design Guide

This chapter also includes recommendations regarding bicycle system facilities as part of the NMTP.

Bike Lanes

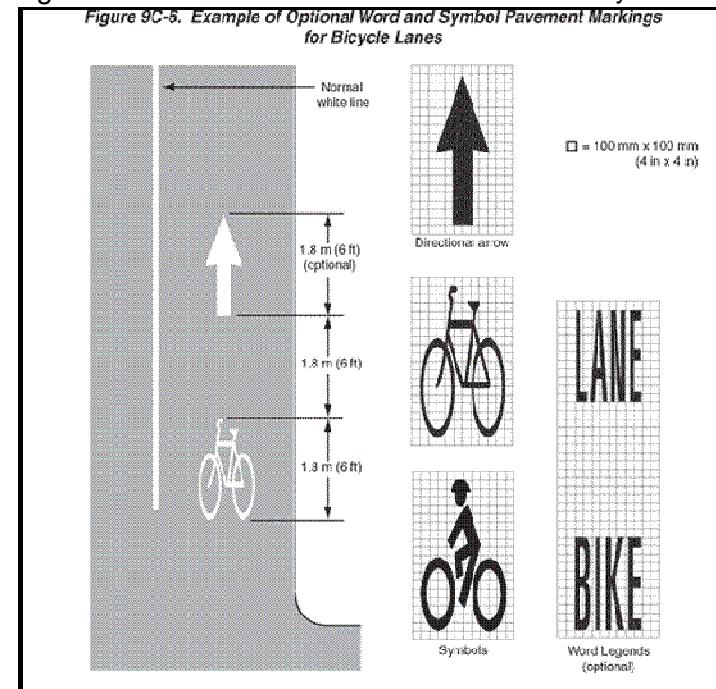
Lakewood's draft street standards should mandate bicycle lanes on Principal and Minor Arterial streets. The draft qualifier language suggests that four-foot lanes are to be placed "when" bike lanes are required, but there are no further policy or regulatory statements that indicate what triggers the requirement.

AASHTO suggests that five-foot bike lanes are most appropriate on arterial streets. Lakewood should reconsider replacing its four-foot bike lane standard with a five-foot standard.

Bike Lane Symbols and Markings

The City should consider adding to its draft design standards a set of bike lane symbols and markings consistent with the MUTCD. **Figure 6-12** summarizes the recommendations of the MUTCD.

Figure 6-12. MUTCD Standard Bike Lane Symbols

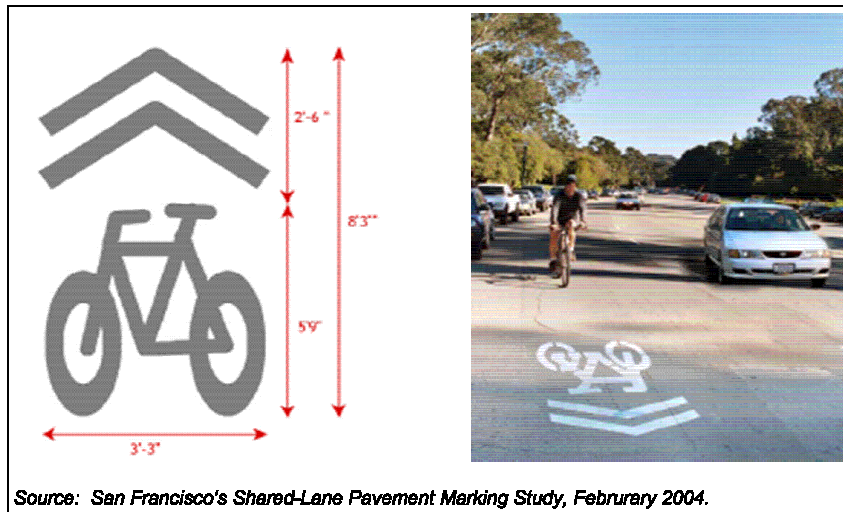


Shared-Lane Symbols and Markings

In the absence of sufficient space to include on-street bicycle lanes on several of Lakewood's major streets, it is important to provide greater route designation for shared travel lanes. These shared lanes, if posted and marked appropriately, indicate significant bicycle traffic to both the motorists and cyclists. The use of "sharrow"

pavement markings has been adopted by the state of California for these conditions, and is subject to be included in the next edition of the MUTCD (due in 2009). Example “sharrow” pavement markings are illustrated in **Figure 6-13**.

Figure 6-13. “Sharrow” Symbol and Pavement Marking

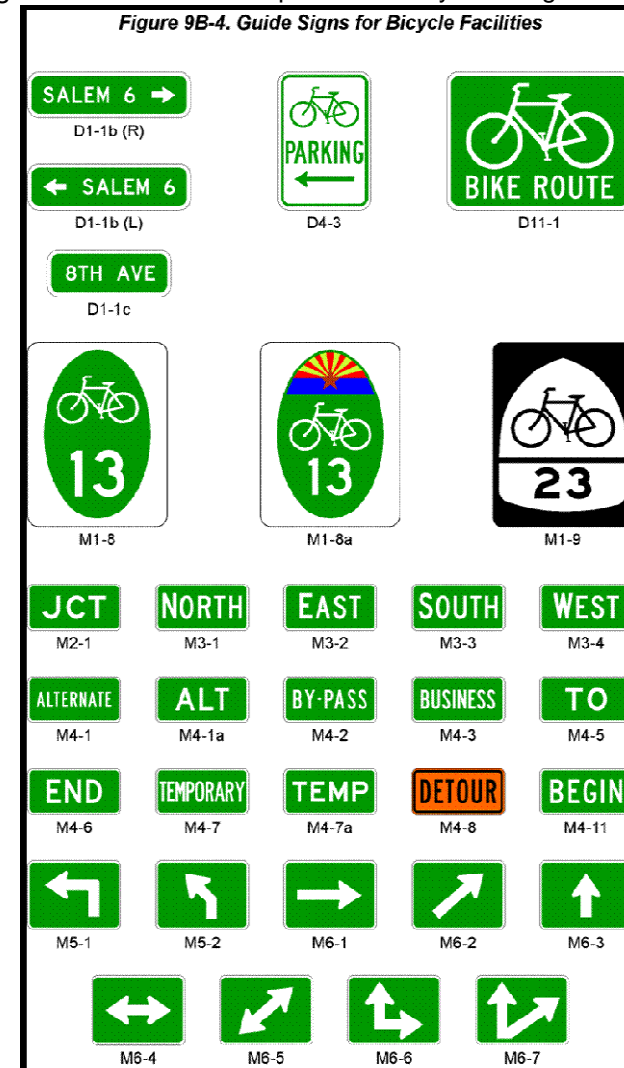


Further statewide policy consideration may be required before application and appropriate designation of sharrow pavement markings within the City of Lakewood if implemented before the MUTCD update. The City should exercise caution in “sharrow” pavement marking placement, particularly along streets with on-street parking and multi-lane arterials. See San Francisco’s research and findings in report titled “San Francisco’s Shared-Lane Pavement Marking Study^{xii}.”

Bicycle Route Signing

Auxiliary signs may be used with standard bicycle route signs to inform cyclists of route continuity and major cycling attractions. Revised research by MUTCD sub-committee work has recently been completed and the MUTCD will be updated to include findings. Meanwhile, examples are shown in **Figure 6-14**.

Figure 6-14. Example of Auxiliary Bike Signs



The City of Lakewood should consider implementation of a city-wide bike route signing program that better links the on-street facilities and

the shared-use paths. Once the MUTCD is revised, the City should consider the following for use in the installation of *junction*, *cardinal direction* and *alternative route auxiliary* signs (in conjunction with appropriate Bicycle Route Guide signs, Bicycle Route signs, or US Bicycle Route signs):

Advance Turn Arrow (M5 series) and Directional Arrow (M6 series) auxiliary signs should be mounted below the appropriate Bicycle Route Guide signs, Bicycle Route signs, or US Bicycle Route signs.

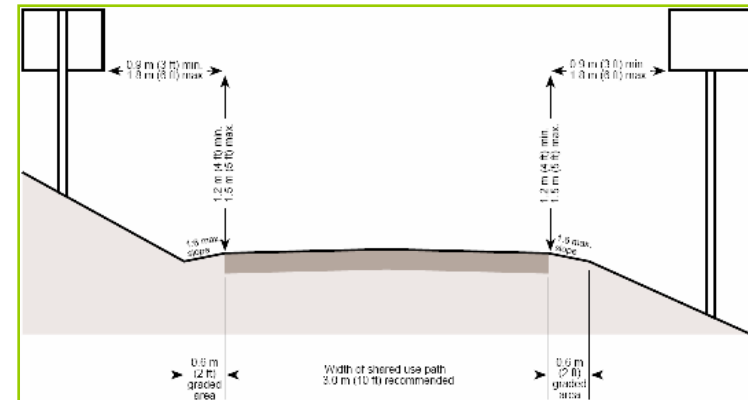
- Route sign auxiliaries carrying word legends that are used on bicycle routes should have a minimum size of 12 x 6 inches.
- Route sign auxiliaries carrying arrow symbols that are used on bicycle routes should have a minimum size of 12 x 9 inches.
- All route sign auxiliaries are to match the color combination of the route sign that they supplement.
- Destination may be mounted below Bicycle Route Guide to furnish additional information, such as directional changes in the route, or intermittent distance and destination information.

Further plan recommendations on route signing are provided in Chapter 7, Wayfinding.

Shared-Use Path Standards

As the City of Lakewood proceeds to plan, design and construct share-use paths, a consistent design standard should be used. The City should consider adopting those standards set forth in FHWA's *Designing Sidewalks and Trails for Access* for ADA compliance and AASHTO *Guide for the Development of Bicycle Facilities*. See **Figure 6-15** for a typical cross-section. AASHTO considers ten feet as *recommended* pavement width (8 feet is *adequate* under low volume conditions), but 12 or 14 feet as *desirable* if significant volume and mix of users (jogger, walkers, cyclists, etc.) is present.

Figure 6-15. Example Cross Section of Two-Way Shared Use Path on Separate Right-of-Way



Re-Striping Arterials with Bike Lanes

As the City considers re-striping some of its arterials with on-street bike lanes it may encounter the need to reduce travel lane widths and parking space. An excellent guide for consideration when reducing travel lane widths is ITE's *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*^{xiii}.

Other Bicycle Design Features

Bicycle Parking

Many potential bicyclists are hesitant to ride for utilitarian trips because they fear their bicycles will get stolen. There is a widespread perception that any bicycle rack or hardware is not very helpful in deterring theft. The real and perceived fear of bicycle theft is a major impediment to greater bicycle ridership and nationally.

The City of Lakewood should review and consider appropriate revisions to its building code and development ordinance to help

ensure the appropriate placement (convenient and safe) and number of bicycle racks through the following measures:

- Placement — an adequate number of bicycle parking racks and/or lockers as needed at the appropriate destinations, such as schools and colleges, public gathering places, transit stations, bus stops, and shopping centers.
- Design—the recommended style of bicycle rack is the inverted "U" Bike Rib bicycle rack or the equivalent.
- Security—encourage employers and property owners to either provide secure parking near building entrances and protected from rain, or allow secure storage inside buildings.
- Convenience—encourage merchants to provide secure, practical bicycle parking for customers.

Bike Box

As shown in **Figure 6-16**, a bike box facilitates a "two-point left turn" or "box turn" and can also improve cyclist safety conditions by prohibiting vehicles from turning right at red lights, sometime resulting in bicycle crashes. Bike boxes can also be placed at stop signed intersections.

Figure 6-16. Bike Box Example



Care must be taken in the design of bike boxes to ensure appropriate and safe motor vehicle sight-lines as a result of revised placement of vehicular stop bars. The bike box provides additional space and priority for cyclists who are crossing major traffic flow, facilitating a two-point turn by placing bicyclists ahead of the stop line

in the cross street for motor traffic and also to the left of right-turning traffic.

Drainage Grates

Lakewood should consider replacing or modifying older drain grates that are not conducive to bicycle safety. Drainage grates are part of the street drainage system. They capture storm water runoff that has flowed from the roadway into the gutter to be taken away via a subsurface system of pipes or to enter the groundwater through a sump. The City has already revised their street construction standards to include bicycle-safe drainage grates. A "bicycle safe" grate must let water pass without allowing routine types and amounts of debris to clog the inlets--and without trapping bicycle wheels. Lakewood should consider system-wide replacement of older drainage grates with bicycle-safe grates.



Summary

Lakewood will need to evaluate and consider a number of their design standards and policies with respect to the full range of pedestrian and bicycle travel needs. The Lakewood Local Non-Motorized Design Guide identifies the sidewalk, curb ramp and driveway crossing standards that should be amended to best comply with the ADA. The Design Guide also identifies needed revisions to the City's street standards for consistency with the most recent federal bicycle standards and policies. Other policies and standards should be re-evaluated



so the City of Lakewood can better provide a balance of transportation facilities to best meet the multi-modal needs and expectations of Lakewood residents. FHWA's *Designing Sidewalks and Trails for Access* is an excellent, comprehensive resource for Lakewood's use as it evaluates its broader design standards and policies with respect to pedestrian access. AASHTO's *Guide for the Development of Bicycle Facilities* is a good source for bicycle facility design features.

ⁱ Americans with Disabilities Act Accessibility Guidelines, U.S. Access Board, 2002.

ⁱⁱ *Designing Sidewalks and Trails for Access; Part II – Best Practices Design Guide*, U.S. Department of Transportation, 2002; and, *Developing Curb Ramp Design Based on Curb Radius*. Edward R. Stollof. Institute of Transportation Engineers Journal, April 2005.

ⁱⁱⁱ *Guide for the Planning, Design and Operation of Pedestrian Facilities*, American Association of State Highway and Transportation Officials, 2004.

^{iv} *Pedestrian Facilities Users Guide – Providing Safety and Mobility*, Federal Highway Administration, March, 2002.

^v *Guide for the Development of Bicycle Facilities*, American Association of State Highway and Transportation Officials, 1999.

^{vi} *Manual of Uniform Traffic Control Devices*, U.S. Department of Transportation, Federal Highway Administration, 2004. See also Washington State Modifications to the MUTCD, M 24-01.

^{vii} WSDOT Design Manual, Bicycle Facilities—Section 1020, 2001

^{viii} Americans with Disabilities Act Accessibility Guidelines, U.S. Access Board, 2002.

^{ix} See FHWA Memorandum, July 30, 2004. “The US Access Board, the federal agency responsible for developing accessibility guidelines under the Americans with Disabilities Act (ADA), published the ADA/ABA Accessibility Guidelines (ADA/ABA-AG) on July 23, 2004. The Access Board is charged with developing minimum guidelines to assist the Department of Transportation (DOT) and Department of Justice (DOJ) in establishing design standards. Although the publication of these guidelines marks the completion of the Access Board's responsibilities, these guidelines will not become ADA standards until the Departments of Justice and Transportation go through standard notice-and-comment rulemaking to adopt the new guidelines into the

standards they maintain under the ADA, a process which is expected to take one to two years. In the interim, agencies must continue to use current ADA standards -- including those for detectable warnings at curb ramps and blended transitions -- when building new and altering pedestrian facilities. Therefore, there have been no changes to the existing requirements (since July 26, 2001) that detectable warnings must be applied to curb ramps in new construction and alterations.

As part of updating the guidelines, the Access Board has developed more specific guidelines for public rights-of-way. On June 17, 2002 the Board released a draft of these guidelines for public comment in advance of publishing a proposed rule. Included are provisions for sidewalks, curb ramps, street crossings and related pedestrian facilities that are not addressed in the newly published ADA/ABA-AG. Both FHWA and the Access Board encourage use of the June 17, 2002 draft's scoping and technical provisions for detectable warnings as an equivalent facilitation to the current requirements in the 1991 (current) ADAAG.

USDOT is an implementing agency for the title II of the Americans with Disabilities Act and for section 504 of the Rehabilitation Act; the FHWA is the USDOT agency responsible for overseeing Title II and 504 compliance for pedestrian access in public rights-of-ways. USDOT is evaluating the ADA/ABA-AG and considering possible changes to USDOT section 504 regulations to reflect current detectable warning requirements until such time as the new public rights-of-way guidelines can be issued. The FHWA MUTCD staff are also pursuing inclusion of detectable warnings in Chapter 3 Markings. NCHRP and FHWA research is also underway to improve truncated dome maintenance and contrast.”

× **Pierce Transit, Bus Stop Manual, July 2005.**

^{xi} See (a) *Manual of Uniform Traffic Control Devices*, U.S. Department of Transportation, Federal Highway Administration, 2004; (b) *Signalized Intersections: Information Guide*, FHWA, August 2004; (c) *Accessible Pedestrian Signals: Synthesis and Guide to Best Practice*. National Cooperation Highway Research Program (NCHRP), Research Results Digest, July 2003, Number 278; and, (d) on-going NCHRP research grant 3-62.

^{xii} *Shared-Lane Pavement Marking Study*, City of San Francisco, February 2004.

^{xiii} *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*, Institute of Transportation Engineers, 2006.

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Non-Motorized Transportation Plan



Chapter 7—Wayfinding Guide

Introduction

The City of Lakewood's street system was developed around and between major geographic features and barriers, resulting in a pattern of multiple directions, angles and non-traditional intersections. Especially for recreation cyclists and walkers, the area's many destinations are difficult to reach while negotiating the street system. As the City implements and eventually completes its NMTP there will be more convenient routes for non-motorized travel. Cross-town travel could remain tricky, so a system of supplemental wayfinding signs can significantly enhance non-motorized travel within the Lakewood urban area and between its neighboring cities. Well-defined and placed wayfinding signs can better inform walkers and cyclists towards the appropriate routes and destinations.

The importance of this wayfinding chapter lies in the need for the City of Lakewood to produce a clear, concise signage program that defines the area's features and safely directs people to their destinations whether they are walking or cycling, and in some cases driving.

Purpose of Wayfinding

Wayfinding helps people find destinations from all travel modes by using a succession of cues, primarily visual, that help a user experience an environment in a positive way. It facilitates easy access from point A to point B. When executed successfully, the system reassures the user and creates a welcoming environment, whether it is in a park, a neighborhood, or a city. Wayfinding can also provide opportunity for Lakewood to define its gateways, either at the city edge or edge of the downtown area.

By providing a hierarchy of information through wayfinding signage, users in Lakewood will be able to rely on a clear navigation system that gives them ease of decision-making and execution while cycling, walking or driving in the community. The results of such a friendly

environment can lead to better vehicle, bicycle and pedestrian traffic flow.

An effective wayfinding system can be a particularly helpful tool for visitors who may be unfamiliar with Lakewood, as well as giving businesses and residents a sense of place and community as Lakewood continues to take more urban shape.

Directional signs should recognize attractions and amenities. Everything from parking and parks to shopping and dining could be identified. In addition, a few area attractions and services should be provided individual signs that are consistent with the overall sign plan. The suggested attractions that would benefit the visitor by having consistent directional signage would include Lakewood Towne Center, Fort Steilacoom, City Hall, and key external destinations within neighboring cities.

Wayfinding's effectiveness depends on typeface, font, size and spacing between letters and words. For example, a combination of uppercase and lowercase letters is easier to read than only uppercase. Color contrast is also essential for optimum readability.

Bicycle Wayfinding

Roadway signs, markings, and signals in the United States are governed by the MUTCD, a manual that is managed by the Federal Highway Administration (FHWA). Signs not in the MUTCD may be used on an experimental basis. All experiments must be filed with the FHWA in advance, FHWA must approve the experiment, and the agency must sign an agreement to return the location to compliance with the MUTCD once the experiment is completed.

In general, the MUTCD requires that signage for bicycle routes to include both the words "Bike Route" and a bicycle symbol on a bicycle sign, then another panel showing the destination name, and another for the route number. An example of the current MUTCD Bike Route sign is shown here.



The current MUTCD calls for signs at decision points, and where routes change.

National Best Practices

The City of Chicago has developed an alternate set of bicycle route signs, which combine direction, distance, and destination on one sign, eliminating the words “Bike Route” in favor of a bicycle symbol. Chicago’s “Bike Route” signs are placed after every turn, after every major signalized intersection, or every 1/4 mile. The Destination, Direction, Distance panel signs are placed where bike routes intersect. The attached photo shows an example Chicago’s wayfinding signs.



The National Committee on Uniform Traffic Control Devices (NCUTCD) has recently recommended that Chicago’s signage be included in the MUTCD to supplement the signage currently in the MUTCD. Bicycle route guide signs may be provided to inform bicyclists of bicycle route direction changes and to confirm distance, direction, and destination. The attached illustration is an example of an alternative bicycle route sign.



Pedestrian Wayfinding

There is no national standard for pedestrian wayfinding signs comparable to the MUTCD. Pedestrian wayfinding signs are usually one of two types: directional or maps. Directional signs are usually simple signs with an arrow indicating direction, a destination name, and sometimes distance to the destination. Maps usually show the pedestrian their location, and the surrounding streets and destinations. Pedestrian wayfinding signs are usually intended to direct pedestrians over short distances, often ½ mile or less.

The nature of being a pedestrian in contrast to a motorist or bicyclist means that the pedestrian can approach the sign more closely, and take as much time as they want to read it. Therefore a pedestrian sign can contain a lot more detail than is possible with a sign directed at motorists or bicyclists. Pedestrian signs and maps may serve an educational as well as a wayfinding purpose. For example, pedestrian signage could contain information about the natural and man-made landscape.

A good pedestrian wayfinding map should be readable, and show the right level of detail. It usually shows the area within a reasonable walking distance, often a half-mile or one-mile radius. Important buildings, streets, parks, and transit facilities are often shown. This photo is an example of a neighborhood wayfinding map for pedestrians in Arlington, Virginia.





Non-Motorized Transportation Plan



Chapter 8—Pedestrian and Bicycle System Plans

Introduction

The Lakewood NMTP Steering Committee was essential in helping establish non-motorized priorities and in the review and general consensus of draft pedestrian and bicycle plan recommendations—mainly the respective, draft pedestrian and bicycle system plan maps. These maps indicated the priority pedestrian and bicycle projects identified in the Lakewood urban area, generally to be constructed over the next 20 years. The draft maps were then finalized as the major culmination of the Pedestrian and Bicycle System Plans. The following describes each plan.

Pedestrian System Plan

Chapter 3 summarized the process establishing the priority sidewalk and curb ramp improvement needs and their costs based on a GIS composite accessibility index scoring system. The first step in defining Lakewood's Pedestrian System Plan involved consideration of the three GIS accessibility priority groups:

- High* – potential projects (new sidewalks and curb or replacement sidewalks and curb ramps) located near major pedestrian activity corridors or centers;
- Medium* – potential projects located near relatively minor pedestrian activity centers; and
- Low* – potential projects found generally along local streets in remote residential areas, with relatively low pedestrian activity.

The second step involved defining logical pedestrian corridor projects that addressed high priority needs (local accessibility – see Figures 3-1 and 3-2), but also provided continuous linkages between major non-motorized trip generators or attractions, particularly those connections that link various neighborhoods with each other and downtown Lakewood. The resulting Pedestrian System Plan culminating this two-step process is illustrated in **Figure 8-1**.

New Sidewalks and Shared-Use Paths

As shown in Figure 8-1, the recommended Pedestrian System Plan includes a sizeable increase in new sidewalks (over 45 miles) and shared-use paths (over 5.6 miles) for pedestrian travel. The recommended projects include new sidewalks along sections of arterial and collector streets, which in many cases serve as in-fill to match existing sidewalks within these corridors, plus replacement sidewalks to those existing sections that were found to be needing repair.



New Sidewalks on Pacific Highway

Figure 8-1 Pedestrian System Plan

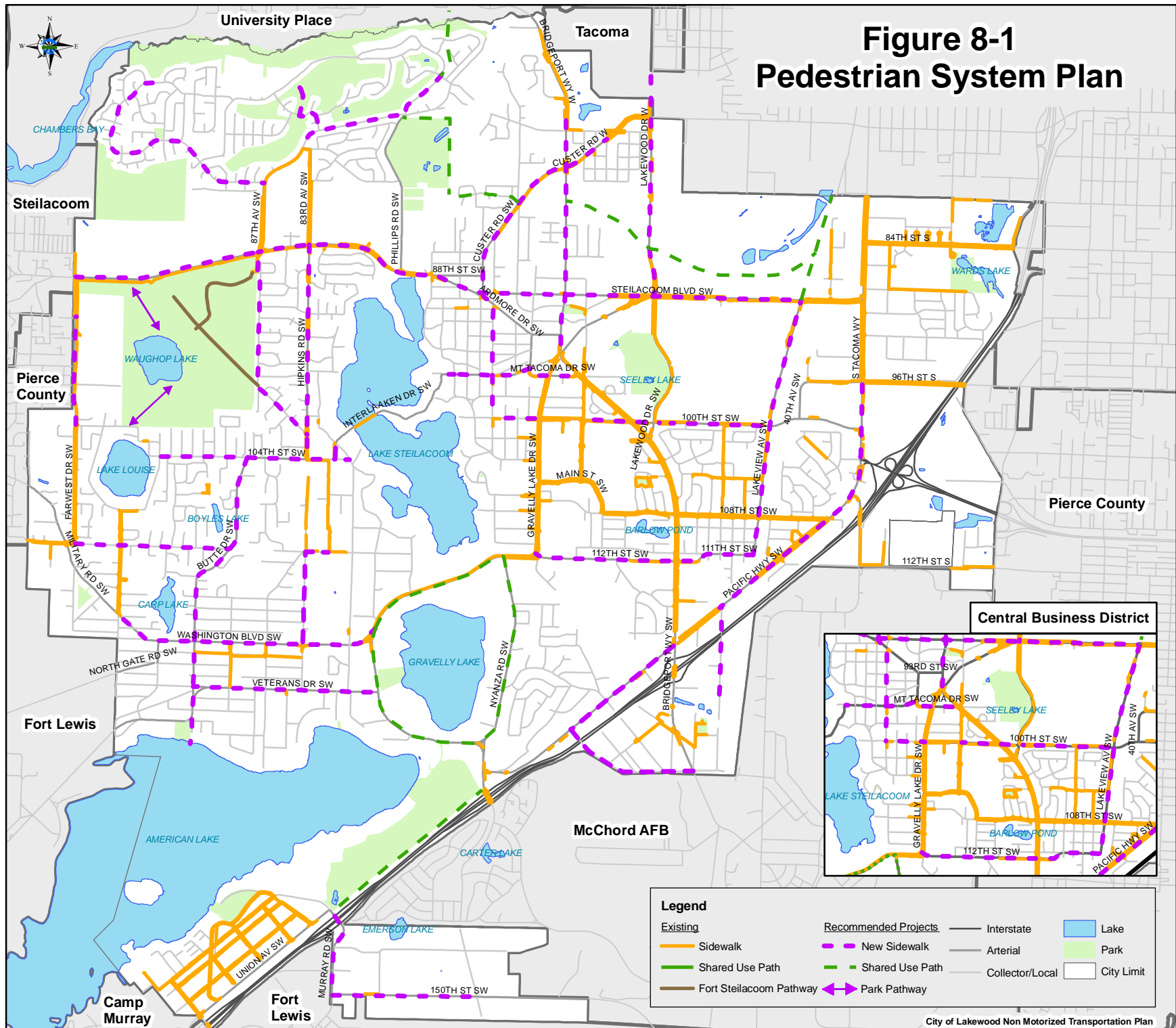
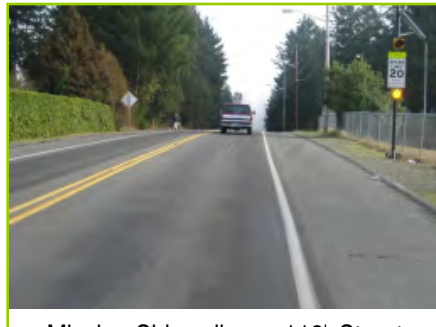


Table 8-1 lists the various new sidewalk projects within the City of Lakewood. The High priority pedestrian system improvements include the completion of critical sidewalk connections along several Principal and Minor Arterial streets, including:

- Steilacoom Boulevard
- 112th Street
- Lakeview Avenue
- Washington Boulevard

As noted in Table 8-1, some of these sidewalks are likely to be constructed as part of new city arterial projects (urban street upgrades) to be identified in the City's update to its Transportation Master Plan. The street upgrade projects will add more than 25 miles of sidewalk to the city's system.



Missing Sidewalks on 112th Street

New sidewalk projects are also listed in Table 8-1. These projects are estimated at almost \$26 million and total more than 17 miles in new sidewalk construction on important routes such as:

- 100th Street
- Hipkins Road
- Lakewood Drive

The new, high priority sidewalk projects included in the NMTP provide important system connections to major pedestrian trip generators and safety enhancements for pedestrians traveling along busy city arterials streets. Pedestrian access to transit is significantly enhanced by these system improvements.

Sidewalk Repairs

As noted above, there are some existing sidewalks that need to be replaced, either because they have insufficient width or are in poor condition. Slightly more than 5 miles of existing sidewalks are in need of repair within the Lakewood urban area. Figure 8-1 and

Table 8-1 also summarize those corridors where sidewalk repair improvements are needed.

New Curb Ramps and Curb Ramp Replacement

Individual curb ramp projects are not mapped in this chapter but are included within the City GIS database for reference in project planning. As previously summarized in Chapter (Table 3-3), the cost for new curb ramps and curb ramp replacements within High priority accessibility ranking totals about \$0.6 million. These costs are also summarized in Table 8-1.



New Curb Ramps with Truncated Domes

Funding Needs for Pedestrian Improvements

Funding Lakewood's pedestrian system improvements will require a policy commitment by the city. As summarized in **Table 8-1**, the cost to build new and improved sidewalks and curb ramps fully compliant with the ADA within Lakewood's high priority areas is estimated at about \$27 million. When averaged over 20 years this results in an annual cost of about \$1.4 million to add or repair over 23 miles sidewalks and curb ramps in Lakewood's critical corridors. The costs for shared-use paths are discussed further in the Bicycle System plan section.

Table 8-1. Priority Pedestrian System Projects

	Project #	Street	From	To	Distance (mi)	Cost
Complete Streets	NEW SIDEWALKS					
	<i>Candidate Urban Street Upgrades (adding curb, gutter and sidewalks)</i>					
	USU 1	112th St.	Farwest Dr.	Butte Dr.	1.9	\$2,958,000
	USU 2	112th St./111th St.	Gravelly Lake Dr.	Lakeview Ave.	2	\$3,236,000
	USU 3	47th Avenue	124th St	Pacific Highway	0.7	\$1,173,000
	USU 4	Bridgeport Way	McChord	Pacific Highway	0.5	\$1,616,000
	USU 5	Butte Dr./Vernon Ave.	104th St.	American Lake Park	3.3	\$5,154,000
	USU 6	Custer Rd./Ardmore Dr./Meadow Rd.	Burgess St.	100th St.	2.8	\$4,370,000
	USU 7	Steilacoom Blvd.	Farwest Dr. (western city limits)	Lakeview Ave.	3.7	\$5,873,000
	USU 8	Lakeview Ave.	Steilacoom Blvd.	111th St.	2.3	\$3,603,000
	USU 9	McChord/New York	Pacific Highway	Bridgeport Way	1.4	\$2,250,000
	USU 10	Military Rd./Washington Blvd.	Holden Rd.	Gravelly Lake Dr.	2.7	\$4,235,000
	USU 11	Murray / 150th Street	Woodbrook	Pacific Highway	1.6	\$2,471,000
	USU 12	Veterans Dr.	Vernon Ave.	Gravelly Lake Dr.	2.1	\$3,282,000
	<i>Subtotal</i>					25 \$40,221,000
	<i>Candidate New Sidewalk Projects</i>					
	NS 1	83rd Av.	Washington	Idelewood	1.1	\$1,800,000
	NS 2	100th St.	Meadow Rd.	Lakeview Ave.	1.4	\$2,270,000
	NS 3	104th St.	Lake Louise Dr.	Interlaaken Dr.	1.9	\$3,066,000
	NS 4	87th Ave/Elwood Dr./Angle Lane	Steilacoom Blvd.	Hipkins Rd.	2	\$3,225,000
	NS 5	Amber	Onyx	Zircon	0.8	\$1,200,000
	NS 6	Farwest Dr.	Steilacoom Blvd.	101st St.	0.6	\$942,000
	NS 7	Hipkins Rd.	Steilacoom Blvd.	104th St.	1.3	\$2,082,000
	NS 8	Lakewood Dr.	74th St. (northern city limits)	Steilacoom Blvd.	1.4	\$2,168,000
	NS 9	Mt. Tacoma Dr.	Waverly Dr.	Bridgeport Way	1.1	\$1,746,000
	NS 10	Onyx Dr./Phillips Rd.	Garnet Lane	approx. Turquoise Dr.	1.8	\$2,784,000
	NS 11	Onyx Dr./Zircon Dr.	87th Ave.	approx. 97th Ave.	2.9	\$4,572,000
	NS 12	S. Tacoma Way/Pacific Hwy.	96th St.	47th Ave.	1.5	(state)
	<i>Subtotal</i>					17.8 \$25,855,000
	Total					42.8 \$66,076,000
	SIDEWALK REPAIR/REHABILITATION					
	SR 1	100th St.	Meadow Rd.	Lakeview Ave.	1.2	\$218,000
	SR 2	112th St./111th St.	Gravelly Lake Dr.	Lakeview Ave.	0.1	\$21,000
	SR 3	87th Ave/Elwood Dr./Angle Lane	Steilacoom Blvd.	Hipkins Rd.	0.1	\$19,000
	SR 4	Custer Rd./Ardmore Dr./Meadow Rd.	Burgess St.	100th St.	0.4	\$76,000
	SR 5	Farwest Dr.	Steilacoom Blvd.	101st St.	0.2	\$36,000
	SR 6	Lakeview Ave.	Steilacoom Blvd.	111th St.	0.1	\$17,000
	SR 7	Lakewood Dr.	74th St. (northern city limits)	Steilacoom Blvd.	0.2	\$40,000
	SR 8	Mt. Tacoma Dr.	Waverly Dr.	Bridgeport Way	0	\$4,000
	SR 9	Steilacoom Blvd.	Farwest Dr. (western city limits)	Lakeview Ave.	2.9	\$542,000
	Total					5.2 \$973,000
	NEW / REPLACEMENT CURB RAMPS - High Priority (see Appendix A)					\$237,000
	PEDESTRIAN SIGNAL BUTTON REPLACEMENTS					\$264,440
	<i>See Table 8-2 referencing Shared-Use Path and Sounder Station Access Improvements</i>					
	TOTAL SIDEWALK ONLY & CURB RAMP COSTS					\$27,329,440

WSDOT Coordination

Several critical pedestrian routes cross I-5 to link Lakewood neighborhoods to the city system. There are four local arterial street crossings or interchanges with I-5 that currently are missing or substantially missing pedestrian facilities. These routes include:

- South Tacoma Way
- Murray Road
- New York/McChord
- 47th Avenue (important future connection to Sounder Station)

In each case the current structures spanning I-5 were mostly constructed without sidewalks and it is expected that the cost to add sidewalks to these structures would be prohibitively expensive. Eventually, each structure will need to be replaced or modified, at which time new sidewalks should be added. The City will need to coordinate with WSDOT to ensure that new pedestrian facilities are included in any structural upgrades or replacements to the I-5 interchanges or over-crossings.



47th Street Overcrossing of I-5

Bicycle System Plan

Priority was placed in the plan process to identify opportunities to build new (as part of street projects identified in the City TIP) or re-stripe existing arterial streets with bicycle lanes to close critical gaps in the existing system. The city, unfortunately, is tasked with trying to effectively connect its various neighborhoods and downtown and other centers by means of overcoming steep terrain, navigating around several lakes and crossing the Burlington Northern Santa Fe (BNSF) Railroad¹ tracks and I-5. There are limited corridors making these connections, and in each corridor the public rights-of-way are constrained.

As an alternative, along existing streets where space is limited (existing travel lanes and curb/sidewalks) or there are underlying design constraints bicycle lane re-striping was found to be impractical. As an alternative to bike lanes, the plan recommends striping and posting many of these routes as shared lanes with “sharrow” designations (see Chapter 6 – Local Design Guide).

Many cyclists in Lakewood enjoy the existing shared-use path (trail) system, particularly for recreation but some commuter traffic as well. A series of new shared-use path connections are identified in the plan around Gravelly Lake, and along Flett Creek.

Figure 8-2 maps the existing and planned bicycle system for the Lakewood urban area. The bicycle system plan includes re-striping

¹ Sound Transit (ST) has acquired the rail line that runs nearest I-5 in Lakewood, whose proper name was previously the “BNSF Lakeview Subdivision.” Although ST has not formally renamed the line, its staff indicated that due to the ownership change, referring to it as the “ST line” would be appropriate. Further, they noted that the line adjacent to Tillicum could potentially be referenced as the “Lakewood to DuPont segment” as Sounder service extends southward in the future.

about 8 miles of bicycle lanes, 32 miles of shared-use lane (sharrow) routes, and over 7.0 miles of new shared-use paths to fill critical gaps in Lakewood’s bicycle system.

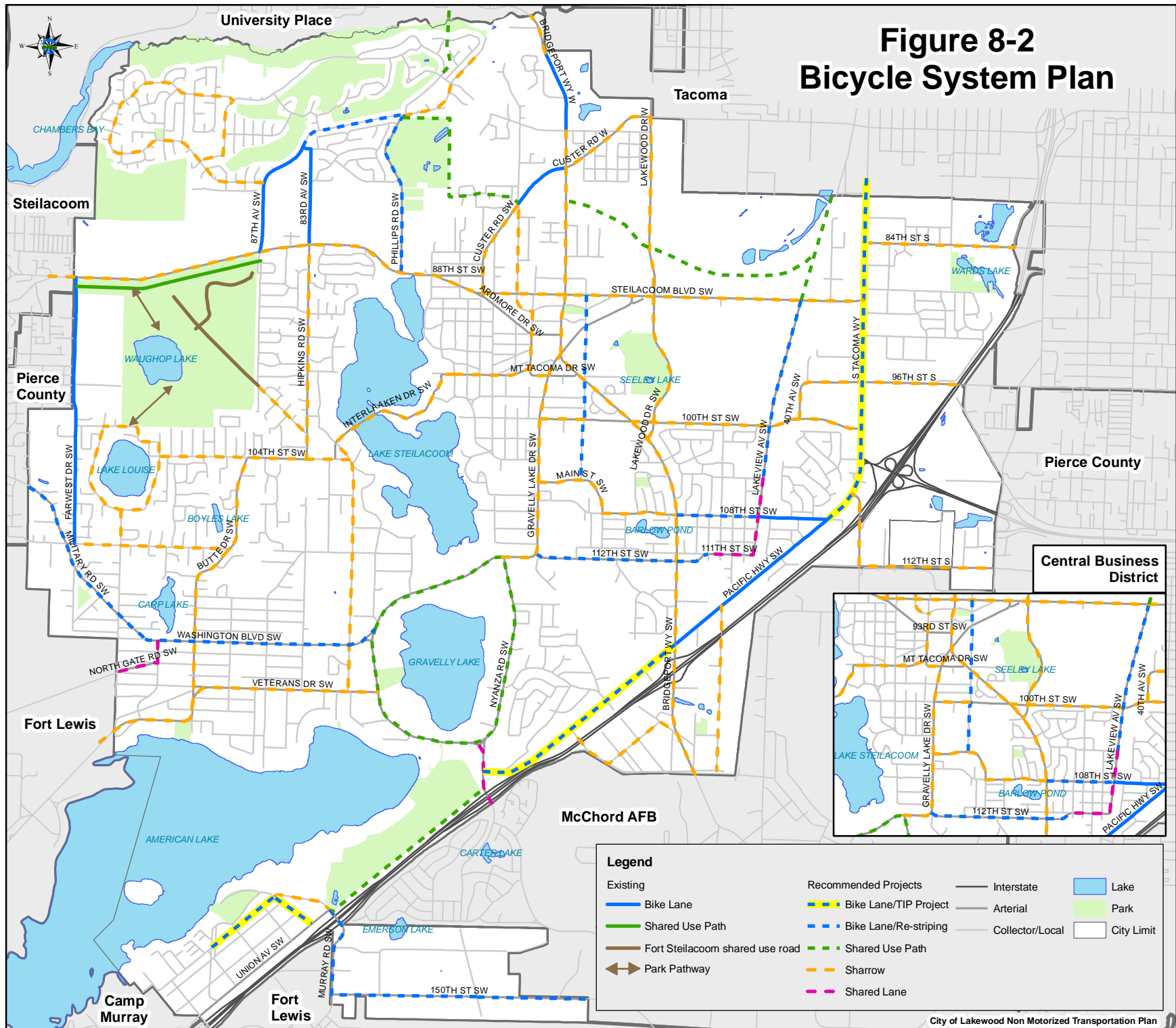
New Bike Lanes

As seen in Figure 8-2, new bike lanes along Pacific Highway are included within the City’s TIP. These new bike lanes are mapped separately in Figure 8-2. In addition, several arterial streets in Lakewood have sufficient paved width for the possibility of re-striping travel lanes to accommodate on-street bike lanes (see Chapter 6 for design guidance on marking and posting bike lanes). These routes provide critical linkages to major cycling activity centers, particularly downtown Lakewood and connections to the shared-use path system. These streets include:

- Washington Boulevard
- 112th Street
- Lakeview Avenue
- 59th Avenue
- Phillips Road



Figure 8-2 Bicycle System Plan

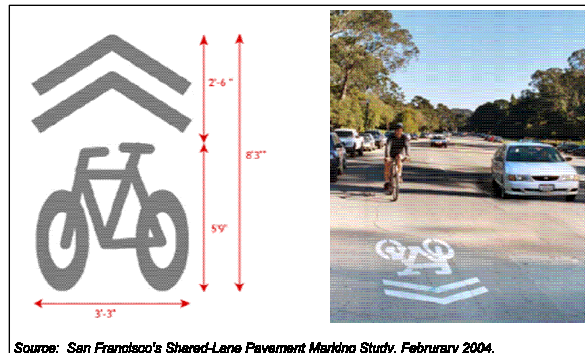


Shared-Lane Routes

The NMTP examined a number of options to help connect the bicycle system within and through the Lakewood urban area. Unfortunately, several major corridors are severely constrained making it difficult to re-stripe existing streets without removing important travel lane vehicular capacity or incurring significant costs to purchase new right-of-way and widen existing streets. As noted in Chapter 6 (Local Non-Motorized Design Guide), use of “sharrow” symbols, and sign-posting shared-use routes can help inform motorists and cyclists of those critical corridors intended for significant bike use. See Chapter 6 for design guidance on marking and posting shared-lane routes.

As illustrated in Figure 8-2, the proposed shared-lane routes provide critical linkages for cyclists in a number of corridors, including:

Steilacoom Boulevard, 100th Street, Main Street, Bridgeport Way, Gravelly Lake Drive, Lakewood Avenue, Interlaaken, Butte Road and 104th Street. Several of these routes are multi-lane arterials. In the implementation of these recommendations, the City of Lakewood should apply signing and striping of sharrow lanes on the two-lane routes first; and then select a demonstration application of sharrows on one of the multi-lane arterials (symbol placement on outer travel lanes) before a system-wide application².



Source: San Francisco's Shared-Lane Pavement Marking Study, February 2004.

Shared-Use Path Connections

New shared-use path connections are recommended around Gravelly Lake next to Gravelly Lake Drive and Nyanza Drive, and along Flett Creek. A new shared use path is recommended between Gravelly Lake Drive and Thorne Lane, paralleling the BNSF Railroad. The proposed path is approximately 1.05 miles long, will cost approximately \$5.0 million, and includes some new rights-of-way, base material, a paved surface of 10-12 feet, and potentially sound walls as part of the Cross-Base mitigation program.

These paths will provide important linkages for future trail users, and provide greater local (cross-town) and regional non-motorized access, especially for recreational cyclists and pedestrians. These projects will require significant design efforts, considering the level of topographic, right-of-way and environmental constraints.

Shared-use paths usually intersect major city arterials at critical junctions. At the western terminus of the existing shared-use path adjacent to Steilacoom Boulevard at Farwest Drive, westward bound cyclists have difficulty crossing Farwest Drive (as do northbound cyclists on Farwest Drive, in the bike lane) to continue traveling westward along Steilacoom Boulevard. This location is an excellent opportunity for the City to consider placement of a “bike box” (see Chapter 6) on the south leg of the Farwest Drive intersection of Steilacoom Boulevard. The “bike box” would provide added space for cyclists wishing to cross and turn left onto Steilacoom Boulevard. If successful, similar “bike box” striping projects could be place at other major intersections.



Routes for Special Study

The NMTP includes various new bike lane, shared-lane and shared-use path connections within a fairly comprehensive system spanning the Lakewood urban area. However, due to topographical and geographical constraints and obstacles, not all corridors are

² Other urban areas (Laz Cruces, New Mexico) are experimenting with sharrows on multi-lane arterials. The City of Lakeview should consider this experience before conducting their demonstration project.

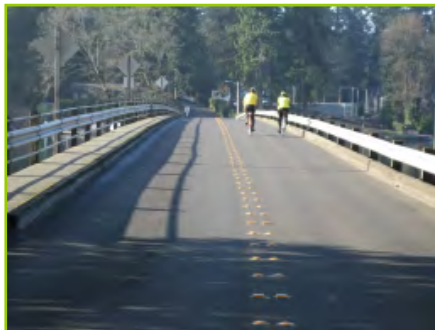
optimally connected and require further study to identify the appropriate, long-range plan solutions.

Gravelly Lake / Nyanza Avenue

Recreational cyclists, walkers and commuter cyclists have different needs to travel around Gravelly Lake. A single design for all non-motorized travel around the lake may not be attainable. Several design options were raised and discussed with the NMTP Steering Committee, and further design considerations will be required before a final project is constructed. As shown in **Figure 8-3**, there are two major options for shared-use path improvements around Gravelly Lake. One option is to locate the pathway on the outside of the streets circling the lake, another is to place them on the inside of the street. The former is likely to benefit commuter and recreational cyclists and the latter to benefit recreational walkers. Issues of available right-of-way and the critical non-motorized crossings of streets connecting to Gravelly Lake Drive and Nyanza Avenue routes will need to be considered in the project's final design.

Interlaaken Bridge

The Interlaaken Bridge is an important non-motorized connector between downtown Lakewood and the Lake Louise area. The bridge's minimum dimension prohibits the re-striping for bike lanes, so use of "sharrow" markings and signs are appropriate. Furthermore, the addition of sidewalks to the bridge may be extremely expensive, and neither connector streets have sufficient space to add sidewalks and curbing treatments without major impacts to private residential landscaping and infrastructure. The current pedestrian access within the corridor (sharing the travel lane and thin shoulders) will likely be required in the future.



Interlaaken Bridge

Downtown Lakewood

There are limited streets in Lakewood's downtown area where bicycle facility enhancements can be made without removing either on-street parking (undesirable to local merchants) or travel lanes (undesirable to commuters). Yet downtown Lakewood is an important non-motorized destination and inter-modal hub. The NMTP identified key corridors in which bicycle lanes can be added by changing current traffic control measures. NW 59th Avenue appears to provide the most feasible route in which there is sufficient space to re-stripe a north-south connector with on-street bike lanes, with a direct connection to Lakewood's city center from Steilacoom Boulevard.

Sounder Station Connectivity

Enhanced pedestrian and bicycle access to the Sounder Station will be important to better link Lakewood to new passenger rail service. In future additions to the City's TIP, sections of Lakeview Drive (south of 108th) and 111th Street (east of Addison) should be considered for full urban street upgrades with sidewalks and on-street bicycle lanes.



111th Street

Figure 8-3. Gravelly Lake Share-Use Path Options



Shared-Use Path Outside of Roadway



Shared-Use Path Inside of Roadway



Funding Needs for Bicycle System Pedestrian Improvements

Planning-level costs were estimated for stand-alone bike lane and shared lane re-striping, and the extension of the shared-use path network. The total cost of the bicycle system improvements is summarized in **Table 8-2** and is estimated at about \$9.6 million over the next 20 years.

Funding the bicycle improvements will also require a policy commitment by the City of Lakewood.

Sound Transit Coordination

Pacific Highway / South Tacoma Way is an important corridor providing non-motorized route connections in the Lakewood area, particularly regarding access to the emerging Sounder transit station located near 47th Avenue. Other street and access improvements will be needed to fully connect Lakewood to the Sounder Station. The City of Lakewood and Sound Transit have been coordinating on land use policy revisions to encourage greater transit-oriented development (TOD) plans and design. To complete the non-motorized connectivity in the area an important grade-separate crossing of the railroad is needed. As shown in **Figure 8-4**, additional pathway improvements will also be needed within the area. The NMTP assumes that these improvements will be made privately as lands are re-developed to the City's TOD policy and standards.

Figure 8-4. Sounder Station Area Access Needs

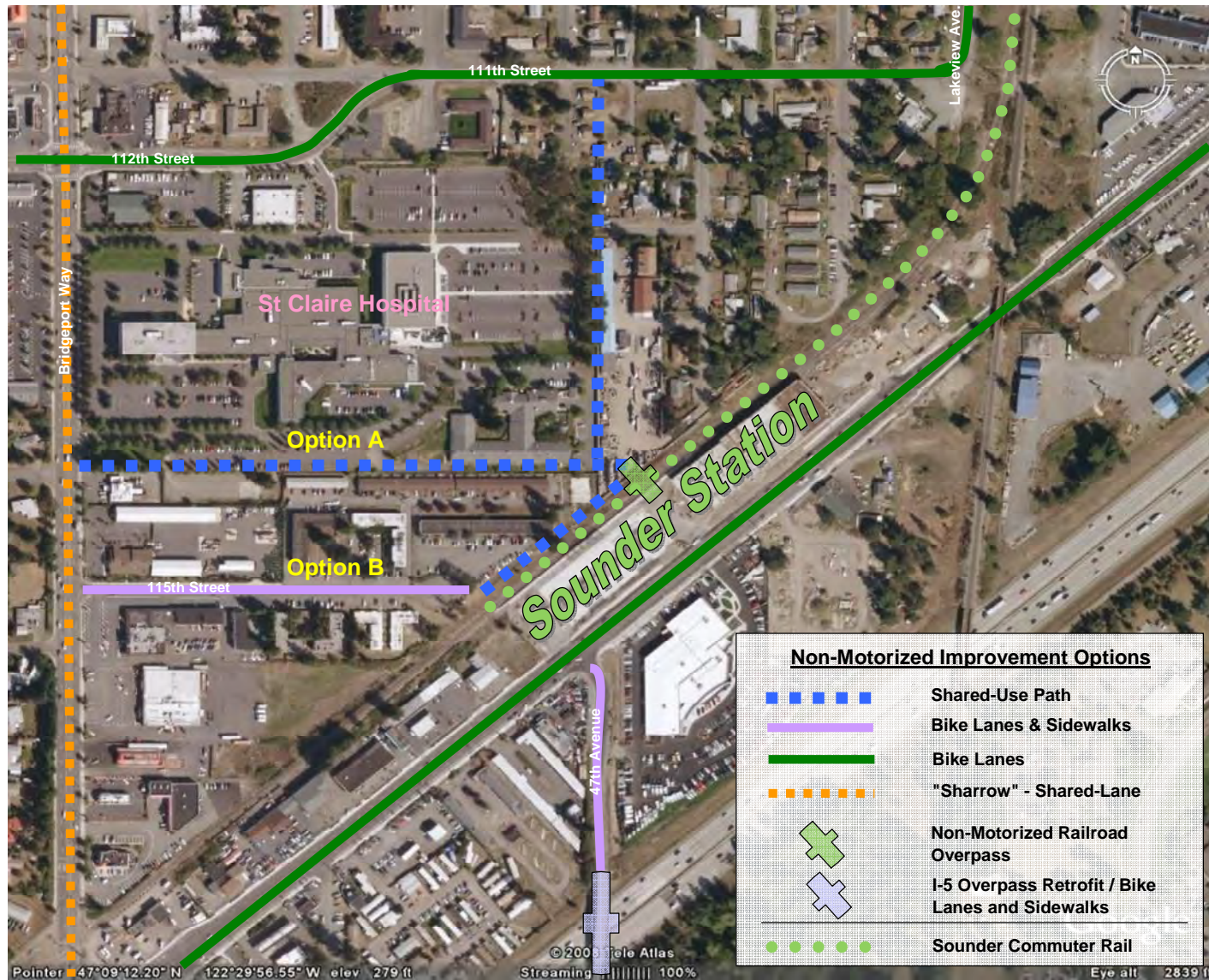


Table 8-2. Priority Bicycle System Projects

<i>Project #</i>	<i>Street</i>	<i>From</i>	<i>To</i>	<i>Distance (mi)</i>	<i>Cost</i>
BIKE LANE SIGNING & MARKING					
BL- 1	Phillips Rd.	Onyx Dr.	Steilacoom Blvd.	0.91	\$29,000
BL- 2	Onyx Dr.	Garnet Lane	Phillips Rd	0.62	\$20,000
BL- 3	Hipkins Rd.	88th St. Ct.	Cross Lane	0.72	\$23,000
BL- 4	Military Rd. & Wash. Blvd.	city limits	Gravelly Lake Dr.	2.35	\$75,000
BL- 5	59th Ave.	Steilacoom Blvd.	Main St.	1.00	\$32,000
BL- 6	Lakeview Ave.	Steilacoom Blvd.	Pacific St.	1.00	\$32,000
BL- 7	108th St.	Bridgeport Way	Lakeview Ave.	0.45	\$15,000
BL- 8	112th St.	Gravelly Lake Dr.	11th St./Freiday St.	0.97	\$31,000
Total				8.02	\$257,000
SHARED-LANE SIGNING & MARKING					
SL- 1	Onyx Dr. & Zircon Dr. & 91st Ave. & 78th St.	87th Ave.	loop around to Onyx Dr.	2.35	\$47,000
SL- 2	Phillips Rd.	Onyx Dr.	68th Ave.	0.57	\$11,000
SL- 3	Steilacoom Blvd.	city limits	S. Tacoma Way	4.38	\$88,000
SL- 4	Hipkins Rd.	Lenox Ave.; North Way; Cross Lane	88th St. Ct.; South Way; 104th St.	0.44	\$9,000
SL- 5	Angle Lane	Elwood Dr.	Hipkins Rd.	0.38	\$8,000
SL- 6	Lake Louise Dr.	101st St.	around Lake Louise	1.44	\$29,000
SL- 7	Holden Rd.	Lake Louise Dr.	112th St.	0.19	\$4,000
SL- 8	104th St.	Lake Louise Dr.	Interlaaken Dr.	1.04	\$21,000
SL- 9	Butte Dr. & Vernon Ave.	104th St.	Veterans Dr.	1.54	\$31,000
SL- 10	Veterans Dr.	city limits	Gravelly Lake Dr.	1.35	\$27,000
SL- 11	Interlaaken Dr.	Mt. Tacoma Dr.	Washington Blvd.	1.89	\$38,000
SL- 12	Thorne Lane	Portland Ave.	Union Ave.	0.32	\$6,000
SL- 13	Custer Rd.	John Dower Rd.; city limits	Steilacoom Blvd.; Bridgeport Way	1.11	\$22,000
SL- 14	John Dower Rd. & Fairlawn & Whitman	Custer Rd.	Motor Ave.	0.95	\$19,000
SL- 15	Bridgeport Way	Custer Rd.	southern city limits	3.54	\$71,000
SL- 16	Lakewood Dr.	74th St. (city limits)	Bridgeport Way	1.82	\$36,000
SL- 17	Mt. Tacoma Dr. & Motor Ave.	Interlaaken Dr.	Gravelly Lake Dr.	0.61	\$12,000
SL- 18	100th Street	Gravelly Lake Dr.	59th Ave.	0.25	\$5,000
SL- 19	Gravelly Lake Dr.	Bridgeport Way	112th St.	1.14	\$23,000
SL- 20	Main St. & 108th St.	Gravelly Lake Dr.	Bridgeport Way	0.87	\$17,000
SL- 21	New York Ave. & Lincoln Ave. & SF Ave.	Pacific Hwy.	Bridgeport Way	0.76	\$15,000
SL- 22	47th Ave.	Pacific Hwy.	121st St.	0.32	\$6,000
SL- 23	100th St.	Bridgeport Way	S. Tacoma Way	1.27	\$25,000
SL- 24	96th St. & 40th Ave.	100th St.	I-5	1.02	\$20,000
SL- 25	S. Tacoma Way & 112th	Pacific Hwy.	eastern city limits	1.14	\$23,000
SL- 26	84th St.	S. Tacoma Way	Tacoma Mall Blvd.	0.81	\$16,000
SL- 27	North Gate Rd / Edgewood Dr	City Limits	Washington Blvd.	0.20	\$4,000
Total				31.69	\$633,000
SHARED-USE PATH					
P- 1	Gravelly Lake Dr. & Nyanza Rd.	around Gravelly Lake	around Gravelly Lake	2.93	\$836,000
P- 2	Flett Creek	Railroad path	Bridgeport Way	1.7	\$485,000
P- 3	Railroad path	Steilacoom	74th Street	1.0	\$285,000
P- 4	Railroad Crossing - Sounder Station	(public-private cost sharing likely as part of land re-development)		0.1	\$2,000,000
P- 5	Sounder Station Access	Bridgeport & 111th Street	New RR Bridge	0.25	\$71,000
P- 6	Railroad path	Gravelly Lake Drive	Thorne Lane	1.04	\$5,000,000
Total				7.02	\$8,677,000
TOTAL BICYCLE SYSTEM COSTS					\$9,567,000

Non-Motorized Funding Needs

The combined non-motorized system priority improvement costs are slightly less than \$37 million, as summarized in **Table 8-3**.

Table 8-3. Priority Non-Motorized Plan Costs

	Miles	Cost	Annual Cost (rounded)
New Sidewalks	18	\$25,855,000	
Sidewalk Repairs	5	\$973,000	
New / Replacement Curb Ramps		\$237,000	
Pedestrian Signal Button Replacement		\$264,000	
Bike Lane Signing and Marking	8	\$257,000	
Shared-Lane Signing / Marking	32	\$633,000	
New Shared-Use Paths	7.0	\$8,677,000	
Total		\$36,896,000	\$1,844,800

Clearly, the majority of these costs are attributable to high priority sidewalk improvements, and it remains uncertain as to whether some of these sidewalk improvements will be included within other arterial street projects in future updates to Lakewood's TIP.

However, should the City decide to fund these non-motorized improvements over twenty years, the annual cost would be about \$1.8 million. This is a sizeable increase in non-motorized funding than what the City of Lakewood has undertaken in the past.

A preliminary funding assessment was conducted on the various pedestrian and bicycle improvement needs as input into the larger transportation funding question that Lakewood will examine as part of its Transportation Master Plan, at which time the NMTP findings can be revised and updated. It is generally anticipated that the 20-year NMTP priorities will not be funded unless an additional revenue program(s) is implemented.

Sidewalk Construction Program—totaling almost \$26 million. Potential sources include General Fund, New Development and

state & federal grants. The City will need to consider either dedicating more of their General Fund revenues towards sidewalk improvements in these major corridors or consider an additional revenue program, or both. For significant local sidewalk construction it is likely that the only reasonable additional program would be some type of city-wide bond measure, re-paid by an increase in local property tax.

Sidewalk Repair Program—a proposed 50%-50% cost share between the City and adjacent private property owners (total—\$486,500). City source is General Fund.

Curb Ramp Replacement Program—totaling \$0.24 million – constituting a new program within Lakewood's TIP as a dedicated program to address ADA compliance. City source is General Fund and available grants.

Pedestrian Signal Push-Button Replacement—totaling \$0.26 million – constituting a new program within Lakewood's TIP as a dedicated program to address ADA compliance. City source is General Fund and available grants.

Bicycle System Expansion Program—totaling \$2.5 million. City source is General Fund.

Sounder Station Area Access Improvements - totaling approximately \$2.02 million (\$2 million for new, non-motorized railroad bridge over-crossing), including joint transportation/land use development, through a public/private coordination to increase pedestrian and bicycle access across the railroad line to link to the Sounder Station.

Increased funding levels from existing sources or new funding sources will be necessary should the city pursue more aggressive funding of the full priority pedestrian improvements or additional bicycle system facilities.



Non-Motorized Transportation Plan



Chapter 9—Recommended Measures to Implement NMTP

Summary

The Lakewood NMTP process identified a number of planning issues that will require the City's attention and in some cases further evaluation. The findings and recommendations of the NMTP will likely require the City to serve in a coordinating role, with significant cooperation from the Clover Park School District, re-development agencies, WSDOT, neighboring cities, transit providers and other government entities. Coordination will be required to implement the NMTP, with further enhancements to the City's design standards, as part of inter-jurisdictional and private transportation projects. A fragmented implementation of the NMTP carries the risk of inconsistent application of its findings and recommendations.

ADA Coordinator

In accordance with current ADA requirements¹ the City of

Lakewood is to designate an **ADA**

Coordinator. As described in this chapter, there are many important measures that the City should undertake to implement the findings of the NMTP. A well coordinated effort is essential to success. As such, it is recommended that the City re-designate a staffing position - the **NMTP Coordinator** - to effectively and consistently implement the NMTP. The NMTP Coordinator can also serve as the ADA Coordinator in a consistent, dual role.



Sidewalk Construction – Steilacoom Blvd.

This section describes the various NMTP implementation measures to be administered by the NMTP Coordinator.

ADA Policy Coordination

The U.S. Access Board has recently completed a more comprehensive design guideline for pedestrian facilities as part of the ADAAG update. It will be critical for the City of Lakewood to keep current with the revised ADA rules and guidelines. Changes and additions to ADAAG may require the City to revise its pedestrian facilities standards and perhaps update the NMTP.



ADA Title II

New ADA rules, guidelines and standards should be communicated with the local mobility- and vision-impaired community. The City of Lakewood should take a proactive and lead coordination role, as continued rule revisions and guidelines will be developed and practices that the City administers.

Project Programming, Coordination and Development

The NMTP Coordinator can effectively lead the City of Lakewood's efforts to engage neighboring cities, regional transportation agencies, school district and neighborhood associations in prioritizing neighborhood sidewalk and curb ramp improvements and bicycle facility enhancements. These efforts will be necessary to develop the annual update of sidewalk and curb ramp improvement projects and bicycle system enhancements as input into the six-year Transportation Improvement Program (TIP). Defining short-term projects will involve more detailed planning than simply selecting the high priority projects to construct as already noted in the NMTP. Other issues that will affect project priority-setting include:

- Defining “packaged” pedestrian improvements that span or mix *high* and *moderate* priorities, resulting in comprehensive corridor enhancements for construction programming and cost efficiencies

¹ Americans With Disabilities Act Accessibility Guidelines, U.S. Access Board, 2002.

- Complimenting long-range street projects with intersecting sidewalk, curb ramp and bicycle facility improvements to complete neighborhood accessibility
- Coordinating state highway improvement projects with WSDOT and transit station, stop and route improvements with neighboring city pedestrian and bicycle system enhancements
- Re-striping and signing major corridors with on-street bicycle lanes or “sharrow” (shared travel lanes) to link major sub-areas and activity centers to the City’s shared-use path system and major employment, recreation and commercial destinations

NMTP Database Maintenance

The NMTP GIS database should be updated periodically to reflect new or replacement pedestrian and bicycle system improvements within the Lakewood urban area. Updates to the City of Lakewood’s GIS database can either be made on a case-by-case basis or in a comprehensive effort at the end of each year (prior to updates of the 6-year TIP).



GIS Mapping of Existing and Missing Sidewalks and Curb Ramps

Site Plan Review

Even if Lakewood does everything right by revising its design standards and ensuring that pedestrian and bicycle improvements in its public rights-of-way jurisdiction are constructed to meet ADA guidelines and the findings of the NMTP, significant obstacles that impeded safe pedestrian travel might still be constructed elsewhere. Within private developments or along state highways there is similar need to administer and guide good non-motorized design, with emphasis on pedestrian and bicycle circulation and access. The City of Lakewood should continue to coordinate with neighboring cities, WSDOT and Pierce Transit to administer better site plan review practices regarding pedestrian and bicycle access and safety.

WSDOT Coordination

WSDOT’s highways provide critical regional connections within and through Lakewood. Non-motorized accessibility and mobility issues are important along state highways within the city. The City of Lakewood has no immediate jurisdiction over the design and construction of WSDOT facilities. However, the City has a responsibility to ensure that WSDOT requires all new project construction to adhere to the ADA requirements.

The City should encourage WSDOT to complete a thorough examination of each interchange and overcrossing of I-5 within Lakewood with respect to pedestrian and bicycle facilities. The state’s evaluation should address all of the ADA Transition Plan requirements, including a Self-Evaluation and plan to remove pedestrian access obstacles. Such findings can then be administered through each of WSDOT’s design and construction projects to comply with the ADA.

Sidewalk and Bicycle Design Standards

The *Local Non-Motorized Design Guide* (see Chapter 6) provided insight into several critical design issues relating to pedestrian treatments on sidewalks, driveway crossings, curb ramps and crosswalks, and bicycle treatments on streets and shared-use paths. The City of Lakewood should revise and update its design standards to address some of the minor findings and recommendations of the NMTP.

In this process the City will need to lead discussions and educate local contractors and design firms concerning modifications to its design standards.

The City should conduct further research in the application of audible signals to best meet local user



Inaccessible Push Button

needs. Continued research and evaluation of audible signals and truncated dome placement (and curb ramp design) should be conducted by the City, working with the local stakeholders, to best meet user needs.

The City should examine and apply “sharrow” bicycle facility designation, where cyclists and motorists are provided signage and pavement markings to indicate bicycle routes and the sharing of the outside travel lane for joint, vehicle and bicycle use. While not yet adopted by WSDOT in a revision to the state Design Manual, the “sharrow” has been adopted by the state of California and will likely prove beneficial and supportive of bicycle travel within highly constrained arterial street corridors.

Temporary Access in Work Zones

Pedestrian accessibility needs to be maintained in areas of street construction and maintenance. The City should review its standards and policies to ensure that alternative walking routes are secured within designated work zones.

Removing Obstacles

There are some moveable and fixed obstacles along Lakewood's existing sidewalks that limit the minimum pedestrian clear width (4 feet). The City can and should exercise its authority to ensure that these obstacles are removed from the public rights-of-way as early and to the extent possible. Many but not all fixed obstacles need to be removed in order to maintain adequate clear width for pedestrian access. For example, some private utility poles have been placed within the public sidewalk. The cost to move these poles can be extremely high. However, the City has existing agreements with utility providers to move utility lines when reasonable and feasible.



New Bus Stop – No Sidewalks

Other fixed obstacles include mailboxes, fire hydrants and traffic signal poles and equipment.



Transit Station and Stop Coordination

As Pierce Transit implements new transit system enhancements within and through the Lakewood urban area (see Pierce Transit Development Plan), project planning and design for site specific bus stops and stations will intensify. Further work is needed to coordinate the NMTP priorities, and ensure that bus stop facilities within Lakewood's rights-of-way are constructed in compliance with ADA.



Sounder Station Plan – Lakewood Station

Neighborhood Traffic Management

Traffic congestion and management issues will more frequently be raised as the Lakewood urban area grows and matures. To best manage local traffic conditions and non-motorized improvement measures, the City of Lakewood should continue to implement its Neighborhood Traffic Management Program in coordination with the findings and recommendations of the NMTP. The city's Neighborhood Traffic Management Program is designed to improve neighborhood safety and respond to citizen's request for neighborhood traffic monitoring and solutions. Possible solutions or measures are defined through a two-phase process: Phase I measures include various traffic control measures like temporary installation of speed radar devices, pavement markings, target law enforcement, signing and volunteer speed watch efforts; Phase II measures (should Phase I measures not yield sufficient results) include installation of more permanent, physical traffic control devices like speed humps, traffic circles and street medians. It is particularly important to coordinate the Phase II physical traffic control devices with the recommendations and projects identified in the NMTP to help ensure that non-motorized safety is considered.



Walk-to-School Route Planning and Bicycle Education

Currently, the Clover Park School District does not have specified walk-to-school route plans as it mostly buses students the various local school facilities. Walk-to-school route planning may best serve as a mechanism to refine the NMTP, with neighborhood-specific priority refinements and comprehensive projects that best match the

initial priorities identified in the NMTP. Walk-to-school route planning is also an excellent mechanism to advance pedestrian and bicycle safety education. The City of Lakewood has developed initial walk-to-school route plans in coordination with Clover Park School District. As Lakewood continues to develop into a more urban center, walk-to-school routes will likely become more important. The city should continue to coordinate with the Clover Park School District to refine and update future walk-to-school route plans.

Funding

There are several ways in which pedestrian and bicycle system improvements are funded in Lakewood. This section highlights both current funding mechanisms and the options the City might consider to increase funding of pedestrian and bicycle system improvements. Whenever possible the distinction is made between funding programs and funding sources. Pedestrian and bicycle system improvements are funded both *privately* and *publicly* in Lakewood.

Private Pedestrian & Bicycle Systems Development

Within new developments, new sidewalk and curb ramp improvements are often funded privately as required or conditioned by local city and county subdivision policies. Typically, these system improvements are located along local, residential streets; less frequently on collector and arterial streets.

Public Pedestrian & Bicycle Systems Development

State Highways

In general, the City of Lakewood and WSDOT have jurisdiction over most public roads in Lakewood. The funding for state highway and freeway improvements is coordinated through PSRC and construction projects are programmed through Washington's Statewide Transportation Improvement Program (STIP). These highway improvements often include pedestrian and bicycle system components. The funding source for these improvements are generally a combination of federal and state gas taxes, fees and sales tax.

In 2005 the Legislature passed a new transportation revenue package to fund 274 projects across the state over the next 16 years. The 2005 funding package includes:

- 9.5 cents gas tax increase phased in over four years (\$5.5 billion)
- Vehicle Weight Fee on passenger cars (\$908 million)
- The light truck weight fee increase (\$436 million)
- Annual motor home fee of \$75 (\$130 million)

Projects funded by the 2005 Legislature in Lakewood include those projects listed in the proposed 2008-2013 STIP² as follows:

- **100th Street SW:** Gravelly Lake Drive to 59th Avenue - Primary improvements will include curb, gutter and a grade separated, 8 foot wide shared pedestrian and bicycle facility (sidewalk). These improvements will be constructed along both sides of 100th Street SW from Gravelly Lake Drive SW to 59th Avenue SW. In addition to the improvements described above, minimal roadway widening will be necessary at the intersection of Bristol Avenue to accommodate a left turn pocket. Street and pedestrian scale lighting and landscaping will also be installed on both sides of 100th Street SW.
- **Bridgeport Way:** 59th Avenue to Steilacoom Boulevard - Prepare design, purchase right-of-way, and construct curb, gutter, sidewalk, illumination, signal modifications, and associated storm drainage between 59th Avenue and Steilacoom Blvd SW (approximately 2,700 linear feet).
- **Gravelly Lake Drive:** 112th Street to Bridgeport Way - Overlay (pavement) Gravelly Lake Drive SW with hot mix asphalt (HMA) (2" minimum). Plane pavement as required to tie into limits and preserve curb exposure. Modify existing curb ramps and driveways to current ADA accessibility standards.
- **Pacific Highway:** Gravelly Lake Drive to Bridgeport Way - Project provides multi-modal improvements including curb,

gutter, sidewalks, bicycle lanes, street lighting, landscaping, and storm drainage along Pacific Highway between Gravelly Lake Drive and Bridgeport Way. This is primarily a non-motorized project, extending sidewalk/bicycle lane improvements along Pacific Highway to Lakewood's Central Business District and Station District.

- **Pacific Highway:** 108th Street to SR-512 - Project consists of constructing a structural asphalt concrete pavement overlay along Pacific Highway SW/South Tacoma Way SW from 108th Street SW to State Route 512. The existing roadway will be ground to allow the overlay without affecting the existing drainage and driveway connections and a 2 inch thick asphalt concrete overlay will be constructed. In addition, in accordance with ADA regulations, the sidewalk and curb ramps at intersections within the project limits will be reconstructed to meet current ADA requirements.

State Pedestrian and Bicycle Safety and Safe Routes to School Programs

In 2005, the Washington State Legislature included \$74 million over 16 years to support pedestrian and bicycle safety projects such as pedestrian and bicycle paths, sidewalks, safe routes to school and transit. The purpose of the Pedestrian and Bicycle Safety program is to aid public agencies in funding cost-effective projects that improve pedestrian and bicycle safety through engineering, education and enforcement. Eligible projects may include engineering improvements, education programs and enforcement efforts.

WSDOT also administers the Safe Routes to School program, which coordinates federal and state funding commitment to support pedestrian and bicycle safety projects such as safe routes to school, transit and pedestrian and bicycle paths. The purpose of the Safe Routes to Schools program is to provide children a safe, healthy alternative to riding the bus or being driven to school. Eligible projects include engineering improvements, education projects, and enforcement efforts within two-miles of primary and middle schools (K-8).

² Washington State Transportation Department, Draft Statewide Transportation Improvement Program, 2008-2013.

WSDOT has initiated grant funding for both programs. For the 2007-2009 biennium, approximately \$18 million is available for the two programs (\$11 million of state funds and \$7 million of Safe Routes to School federal funds).

City Transportation Improvement Program (TIP)

Pedestrian and bicycle system improvements, separate or along the City of Lakewood streets, are generally programmed through the City of Lakewood's TIP in a number of ways, directly or indirectly:

(1) New Construction – Arterial Streets

The TIP defines arterial street improvements projects, ranging from major street widening to added turn-lane and channelization projects. Pedestrian and bicycle improvements (new or replacement) are often included with these street improvements. A variety of short- and long-range plans and studies and individual requests help identify projects that are included and prioritized in the City's TIP and budget. The City of Lakewood updates its TIP each year and regularly coordinates with other jurisdictions and the community at-large with regards to timing and project priorities. Approximately \$3.4 million is budgeted for new arterial street construction in the 2008-2013 TIP.

(2) Roadway Improvements

Enhancements to Lakewood's existing streets are placed in this category. While some safety measures are addressed by these projects, the majority involve upgrading older streets to urban standard, with curb, gutter, sidewalk and storm drain facilities. Approximately \$30.1 million is budgeted for street upgrades in the 2008-2013 TIP.

(3) Traffic Signals

The installation of new or replacement traffic signals is included in this category. Enhancements to Lakewood's existing streets are placed in this category. These projects oftentimes involve pedestrian crossing enhancements. Approximately \$2.9 million is budgeted for street upgrades in the 2008-2013 TIP.

(4) Transportation Planning

This section identifies plans and programs to improve the city's planning and programming for multi-modal transportation systems. Approximately \$0.25 million is budgeted for planning in the 2008-2013 TIP.

(5) Bikeways

This is a new section identified in the TIP and currently has no budget for 2008-2013, as the city is waiting for recommendations from the NMTP to update this section. Recommended bicycle system signing and striping projects and new shared-use path projects are ideal candidates for the next TIP update to the Bikeways section.

(6) Street Lighting

This section is categorized into arterial and low income street lighting. With a total estimated budget of \$0.36 million, these projects can significantly enhance pedestrian and bicycle safety.

(7) Bridge Inspection

This section includes the biannual budget for ongoing bridge inspection.

(8) Beautification Projects

This section has no budget for 2008-2013. The city may identify beautification projects in the future which could contain important pedestrian and bicycle system improvements.

(9) Roadway Restoration Projects

This section is budgeted with four projects for 2008-2013 at a total of \$4.3 million. This section includes street re-surfacing and some ADA sidewalk and curb ramp projects. This section is important for both the pedestrian ADA coordination but also for those city streets that

are identified for re-striping with either bike lanes or sharrows. In future TIP updates it will be important for the city to coordinate this section with the findings and recommendations of the NMTP to include bicycle system re-striping and signing improvement projects.

(10) Neighborhood Traffic Management Roadway Restoration Projects

This section is budgeted for miscellaneous projects for 2008-2013 at a total of \$0.2 million. This section includes the possibilities for installation of physical traffic control measures but also curbing and possible sidewalk enhancements funds to match local improvement district (LID) projects.



Pedestrian Features on Main Street

Other Funding Options

Local Improvement Districts

In the past the City of Lakewood has administered development of local improvement districts (LID) to fund sidewalk improvements (new and replacement sidewalks) within specified areas. Projected public support for LID funding of significant street and sidewalk systems is uncertain. The City should continue to support the formation of LIDs for critical neighborhood pedestrian system enhancements, alone or as part of street improvements and neighborhood traffic management improvements.

Funding Policies for Lakewood Consideration

The City of Lakewood is currently funding significant pedestrian and bicycle system improvements within the urban area, based on its current major funding sources: federal and state gas taxes, state fees and state grants. As an extension of current practice,

Lakewood should continue to actively pursue additional funding support for pedestrian and bicycle funding through application to various federal and state programs as identified by FHWA as part of SAFETEA-LU and WSDOT, in particular the State Pedestrian and Bicycle Safety and Safe-Routes-to-School Program. The combination of these policies will help the City of Lakewood supplement its current funding programs for pedestrian and bicycle system improvements. As outcome, priority pedestrian improvements may be accelerated, helping the City meet growing demands.

Next Steps

The City of Lakewood should take the following steps, in order of priority, to implement the findings and recommendations of the NMTP:

1. The City of Lakewood should undertake additional planning steps to review and refine its street standards. The review should focus on balancing auto/truck and non-motorized needs. For pedestrians, these include the critical junction points: *intersections*, *cross walks* and *sidewalk connections*. For cyclists, these include shared space on arterial streets between (or within) the outside travel lanes, and along shared-use paths.
2. Conduct further examination of NMTP project definition criteria based on the funding plan and policies derived from the Lakewood Transportation Master Plan process. As part of this effort the City should convene individual working groups with each school and develop more current Safe Route to School maps, plans and policies. Guidelines for these efforts are provided by the Washington State Safety Commission³ and the Institute of Transportation Engineers⁴.

³ *School Administrator's Guide to School Walk Routes and Student Pedestrian Safety*, Washington Traffic Safety Commission and Washington State Department of Transportation, 2003.

⁴ *School Trip Safety Program Guidelines – Recommended Practice*, Institute of Transportation Engineers, 1984.

3. Convene a special city staff working group in the revision of local standards for sidewalks, curb ramps, driveway crossings and traffic signal control facilities to meet ADA requirements, and “sharrow” bicycle facility designations and coordinate consistent regional and local policies for “off-system,” ADA compliance, especially focused on site-plan review. The City should ensure the expeditious review, refinement and adoption of street and sidewalk standards that comply with ADA.
4. Convene local training and development workshops to help educate local contractors, developers and design/engineering professionals with regards to revised ADA-compliant construction standards and applications, and site-plan review procedures. Distribution of the NMTP should precede the workshop invitations as relevant background material.
5. Convene school-specific, walk-to-school route plan refinement efforts to either confirm or expand and refine existing plans. The outcome of these plans, priority sidewalk and bicycle improvements, should then be integrated into refinements to the NMTP project priorities. Participation in these efforts should include the school district and school representatives, parent and neighborhood representatives, law enforcement and City planning and engineering staff.
6. Continue to pursue federal and state funding, especially the WSDOT Pedestrian and Bicycle Safety and Safe Routes to School grant programs, to supplement the City’s current revenue programs for pedestrian and bicycle system improvements.



Lakewood’s public exposure as a designer and provider of street and non-motorized systems. This increased exposure will likely give rise to increased expectations.

The NMTP Coordinator will need to regularly coordinate with the City of Lakewood’s *Government Relations Director* that all of the NMTP findings and recommendations are sufficiently communicated to its constituents.



Pedestrian Features on Main Street

Summary

The recent public opinion research indicates that Lakewood residents regard safe walking routes a public priority, and value the public’s investment in bicycle facilities, especially the shared-use path (trail) system. The City serves a critical role in the planning, development and construction of needed pedestrian and bicycle improvements. The NMTP will certainly elevate the City of



Non-Motorized Transportation Plan



Appendix A – Pedestrian System Inventory and ADA Transition Plan

Appendix A includes the following:

1. A summary of the GPS data dictionary used to record the pedestrian system. See description in Chapter 2.
2. Summary GIS maps of pedestrian and bicycle system inventory and analysis.
3. Summary of Lakewood's Transition Plan to address Americans with Disabilities Act, Title II requirements.

1 - GPS Data Dictionary

"Lakewood Invent_v2", Dictionary, "Location, Type and Description"

"Sidewalk", line, "", 5, seconds, 1, Code

"Width", menu, normal, normal

"< 4 Feet",[5]

"4 Feet",[3]

"5 Feet",[2], default

"+5-6.5 Feet",[1]

"+7-9 Feet",[1]

"10 + Feet",[1]

"Cross-Slope", menu, normal, "ADA Compliance", normal

"< = 2.75°",[0], default

"3° - 4°",[3]

"> 4°",[5]

"Material", menu, normal, normal

"Concrete",[0], default

"Asphalt",[5]

"Brick/Stone Paver",[0]

"Combo conc/pav"

"Surf Cond", menu, normal, "FHWA Rating Scheme", normal,

Label1

"New",[0]

"Very Good",[2], default

"Ave",[3]

"Below Ave",[4]

"Very Poor",[5]

"Maint Req'd?", menu, normal, "Sweeping/Pruning Required",
normal, Label2

"None",[0], default

"Sweep",[1]

"Prune Foliage",[1]

"Sweep & Prune",[2]

"Heave & Crack", menu, normal, normal

"None",[0], default

"Minor <1/4 in",[2]

"Moderate <1/2",[3]

"Significant <3/4 in",[4]

"Extreme 3/4+",[5]

"Panel Length", menu, normal, normal

"3 ft", default

"4-5 ft"

"> 5 ft"

"Panels to Replace?", numeric, 0, 0, 0, 0, normal, normal

"Fixed Obst Type", menu, normal, "typical combination", normal

"None",[0], default

"Utility Poles",[2]

"Mailboxes",[2]

"Meters/Hydrant",[2]

"Signs",[1]

"Poles, Mailboxes",[4]

"Trees",[2]

"3 or more",[5]

"FO Limit Access?", menu, normal, "Below 48 in.", normal

"No", default

"Yes"

"# Fixed Obst", menu, normal, "that reduce width below 48",
normal

"None",[0], default

"1",[1]

"2-3",[2]

"4-6",[3]

"7-9",[4]

"+10",[5]

"Movable Obst Type", menu, normal, normal

"None",[0]

"Msg Boards",[3]

"Parked Car",[3]

"2 or more",[5], default

"Other",[3]

"MO Limit Access?", menu, normal, "Below 48 in.", normal

"No", default

"Yes"

"# Movable Obst", menu, normal, "that reduce width below 48",
normal

"None",[0], default

"1",[1]

"2",[2]

"3",[3]

"4",[4]

"5",[5]
 "Vertical Protrusions", menu, normal, "ADA Compliance - > 4'", normal
 "None",[0], default
 "1-2",[1]
 "3-4",[2]
 "5-6",[4]
 "7",[5]
 "Driveways", menu, normal, "Commercial & Residential", normal
 "Steep Cross-slope",[5], default
 "Compliant",[0]
 "None"
 "# Driveways", menu, normal, normal
 "None",[0]
 "1",[1]
 "2",[2], default
 "3",[3]
 "4",[4]
 "5 or more",[5]
 "# Compliant DW", numeric, 0, 0, 10, 0, normal, normal
 "Buffer", menu, normal, normal
 "None",[5], default
 "2-4 Feet",[3]
 "5 Feet",[0]
 "> 5 Feet",[0]
 "Trees", menu, normal, normal
 "None",[5], default
 "Trees / No Well",[3]
 "Trees in Well",[2]
 "Trees in Buffer",[1]
 "Curb Type", menu, normal, normal
 "Vertical Curb/Gutter",[1], default
 "Concrete Rolled Curb",[3]
 "Asphalt Wedge Curb",[3]
 "Vertical Curb/No Gut",[5]
 "Open Shoulder",[5]
 "Other"
 "No Sidewalk", line, "", 5, seconds, 1, Code
 "Curb Type", menu, normal, normal

"Open Shoulder",[5], default
 "Vertical Curb/Gutter",[1]
 "Asphalt Wedge",[3]
 "Shared-Use Path", line, "", 5, seconds, 1, Code
 "Type", menu, normal, normal
 "Separate ROW", default
 "Streetside"
 "Width", menu, normal, normal
 "10 Feet",[1], default
 "< = 5 Feet",[5]
 "6-7 feet",[3]
 "8 Feet",[2]
 "> 10 Feet",[1]
 "Material", menu, normal, normal
 "Asphalt",[1], default
 "Concrete",[1]
 "Crushed Gravel",[3]
 "Other",[1]
 "Surf Cond", menu, normal, "FHWA Rating Scheme", normal, Label1
 "New",[0]
 "Very Good",[2], default
 "Ave",[3]
 "Below Ave",[4]
 "Very Poor",[5]
 "Maint Req?", menu, normal, "Sweeping/Pruning Required", normal, Label2
 "None",[0], default
 "Sweep",[1]
 "Prune Foliage",[1]
 "Sweep & Prune",[2]
 "Heave & Crack", menu, normal, normal
 "None",[0], default
 "Minor",[2]
 "Moderate",[3]
 "Significant",[4]
 "Extreme",[5]
 "Buffer", menu, normal, normal
 "> 5 Feet",[0], default
 "None",[5]

"2-4 Feet",[3]
 "5 Feet",[0]
 "Driveways", menu, normal, "Commercial & Residential", normal
 "None", default
 "Level ",[0]
 "# Driveways", menu, normal, normal
 "None",[0], default
 "1",[1]
 "2",[2]
 "3",[3]
 "4",[4]
 "5 or more",[5]

 "Curb Ramp", point, "static point", 1, seconds, 1, Code
 "Type?", menu, normal, normal
 "Diagonal", default
 "Perpendicular"
 "Parallel"
 "Built-Up"
 "Bulbout"
 "Surface Condition", menu, normal, "FHWA Rating Scheme",
 normal
 "New / Almost New",[0]
 "Very Good",[2], default
 "Ave",[3]
 "Below Ave",[4]
 "Very Poor",[5]
 "Material", menu, normal, normal
 "Concrete",[0], default
 "Brick/Stone Paver",[0]
 "Asphalt",[5]
 "Top Landing W", menu, normal, normal
 "None",[5], default
 "> = 48 Inches ",[0]
 "36-47 Inches",[3]
 "< 36 Inches",[5]
 "Not Applicable"
 "# Ramps", menu, normal, normal
 "1",[3], default
 "2",[5]
 "Ramp Width", menu, normal, normal
 "> = 48 Inches",[0], default

"36-47 Inches",[3]
 "< 36 Inches",[5]
 "Ramp Slope", menu, normal, normal
 "< = 7.1°",[0], default
 "7.2° - 8.3°",[1]
 "8.4° - 10°",[3]
 "> 10°",[5]
 "CrossSlope-parallel", menu, normal, normal
 "< = 2°",[0], default
 "3° - 4°",[3]
 "> 4°",[5]
 "Truncated Domes?", menu, normal, normal
 "No",[5], default
 "Yes",[0]
 "Approach Type", menu, normal, normal
 "Flare",[5], default
 "Curbed",[5]
 "NA (parallel)"
 "Flare Slope(s)", menu, normal, normal
 "< = 10°",[0], default
 "> 10°",[5]
 "Not Applicable"
 "Gutter Slope", menu, normal, normal, Label1
 "< = 2°",[0], default
 "> 2°",[5]
 "Lip", menu, normal, normal
 "None",[0], default
 "< = 1/4 Inch",[3]
 "1/2 Inch",[4]
 "= > 3/4 Inch",[5]
 "End in Crosswalk?", menu, normal, normal
 "Yes",[0], default
 "No",[5]
 "No Xing Present"
 "Alignment to curb?", menu, normal, "to crosswalk", normal, Label2
 "Perpendic",[0], default
 "Angle",[5]
 "BotLand Width", menu, normal, not_permitted
 "> = 48 Inches",[0], default
 "36-47 Inches",[3]
 "< 36 Inches",[5]
 "None",[5]

"BotLand Slope", menu, normal, not_permitted
 "< = 2°",[0], default
 "+2°- 4°",[3]
 "> 4°",[4]

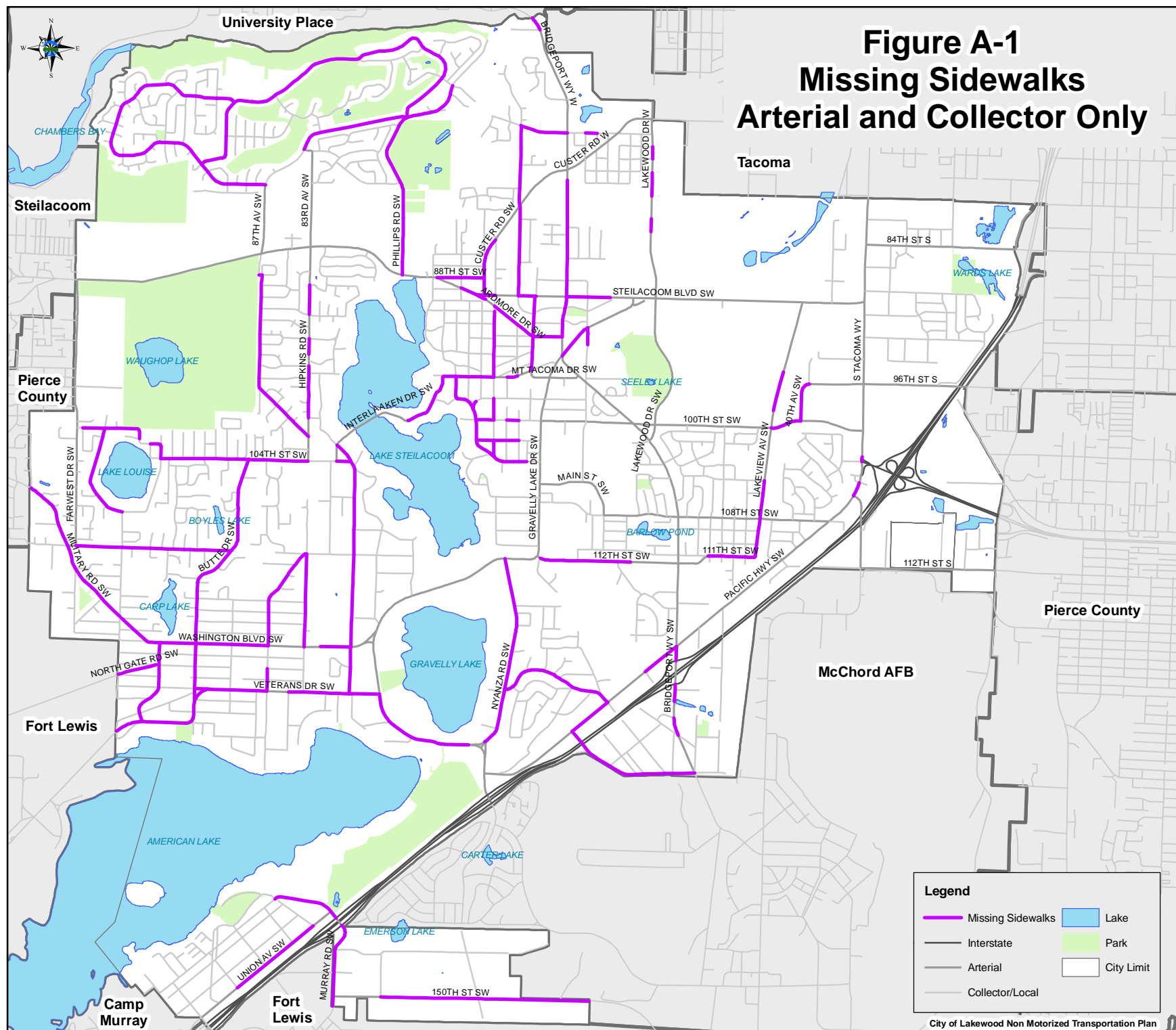
"No Curb Ramp", point, "", 5, seconds, 1, Code
 "Location", menu, normal, normal, Label1
 "Corner",[5], default
 "Mid-Block",[5]
 "Alley Xing",[5]
 "Swalk Flush w/ St", menu, normal, normal
 "Yes", default
 "No"
 "Fix Obst Type", menu, normal, "typical combination", normal
 "None",[0]
 "Utility Poles",[2]
 "Mailboxes",[2]
 "Meters/Hydrant",[2]
 "Trees",[2]
 "# Fixed Obst", menu, normal, "that reduce width below 48'",
 normal
 "None",[0]
 "1",[1], default
 "2",[2]
 "3",[3]

"Non-Compliant Ramp", point, "", 5, seconds, 1, Code

"Ped Button", point, "", 5, seconds, 1, Code
 "BUTTON_ID", text, 30, required, "Pedestrian button identification
 number", normal, Label1
 "BUTTON_TYPE", menu, normal, "Type of button.", normal, Label2
 "Compliant"
 "Non-Compliant", default
 "BUTTON_HEIGHT", numeric, 0, 0, 100, 0, normal, "Height of
 button (inches)", normal
 "BUTTON_REACH", numeric, 0, 0, 100, 0, normal, "Distance of
 button from walk (inches)", normal
 "BUTTON_DISTANCE", numeric, 2, 0.00, 10.00, 0.00, normal,
 "Distance of button from crosswalk (ft)", normal

"STREET_CROSSING", text, 50, normal, "Street that is crossed",
 normal
 "PHOTO", text, 30, normal, "Photo(s) taken at the location", normal
 "AUDIBLE_SIGNAL", menu, normal, "If there is an audible signal",
 normal
 "No", default
 "Yes"
 "POLE_SIDE", menu, normal, "Side of pole the button is on",
 normal
 "Crossing"
 "Non-crossing", default
 "POLE_TYPE", menu, normal, "Type of pole the button is on",
 normal
 "Ped Button"
 "Ped Head"
 "Signal", default

2 - GIS Mapping



**Figure A-2
Sidewalk Surface Condition**

Legend

Sidewalk Surface Condition		Interstate	Lake
New	Very Good	Arterial	Park
Average	Below Average	Collector/Local	City Limit
Very Poor			

City of Lakewood Non Motorized Transportation Plan

Figure A-3 Sidewalk Width

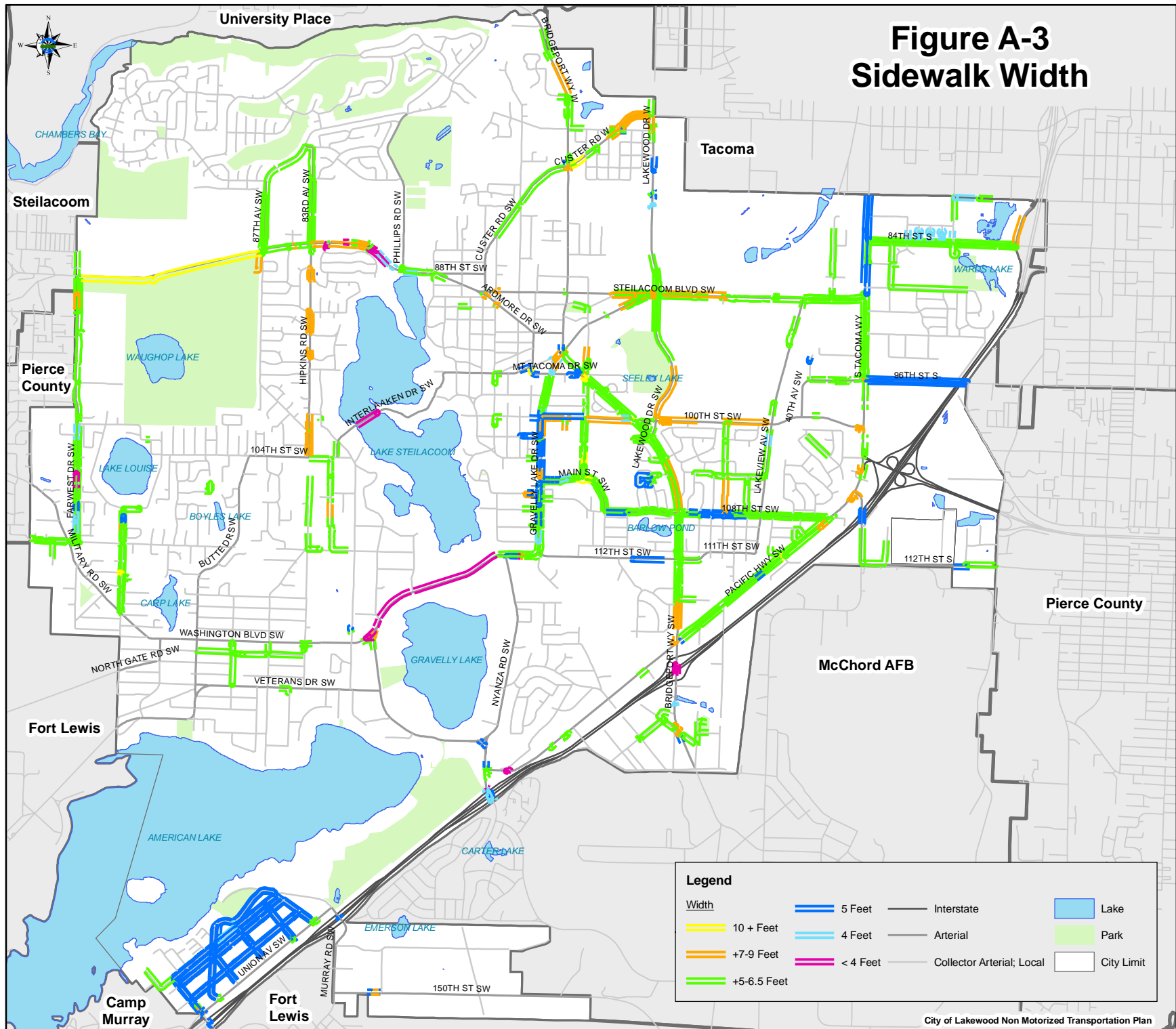


Figure A-4 Schools & Walk-To-School Routes

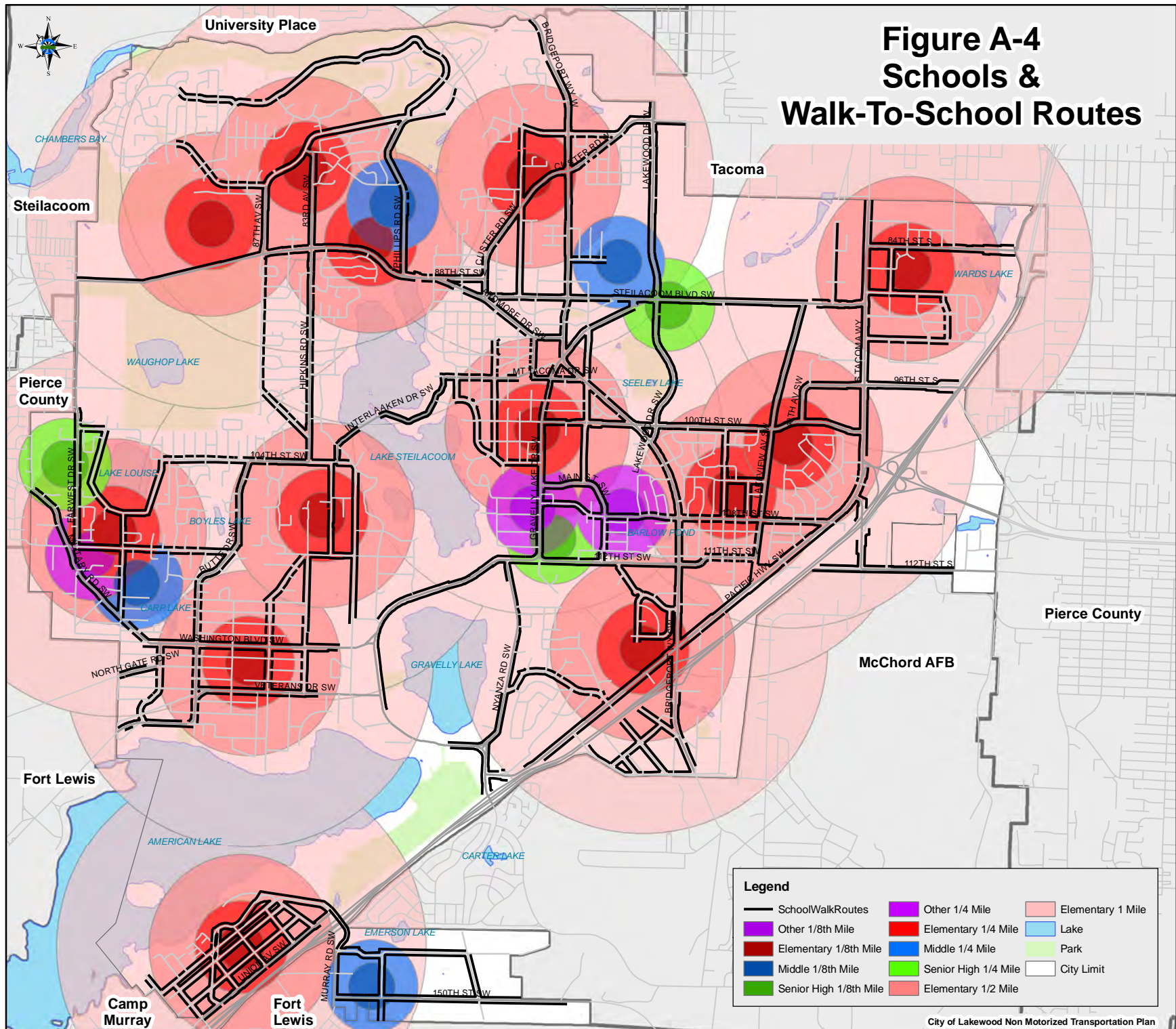


Figure A-5 Local Civic Centers

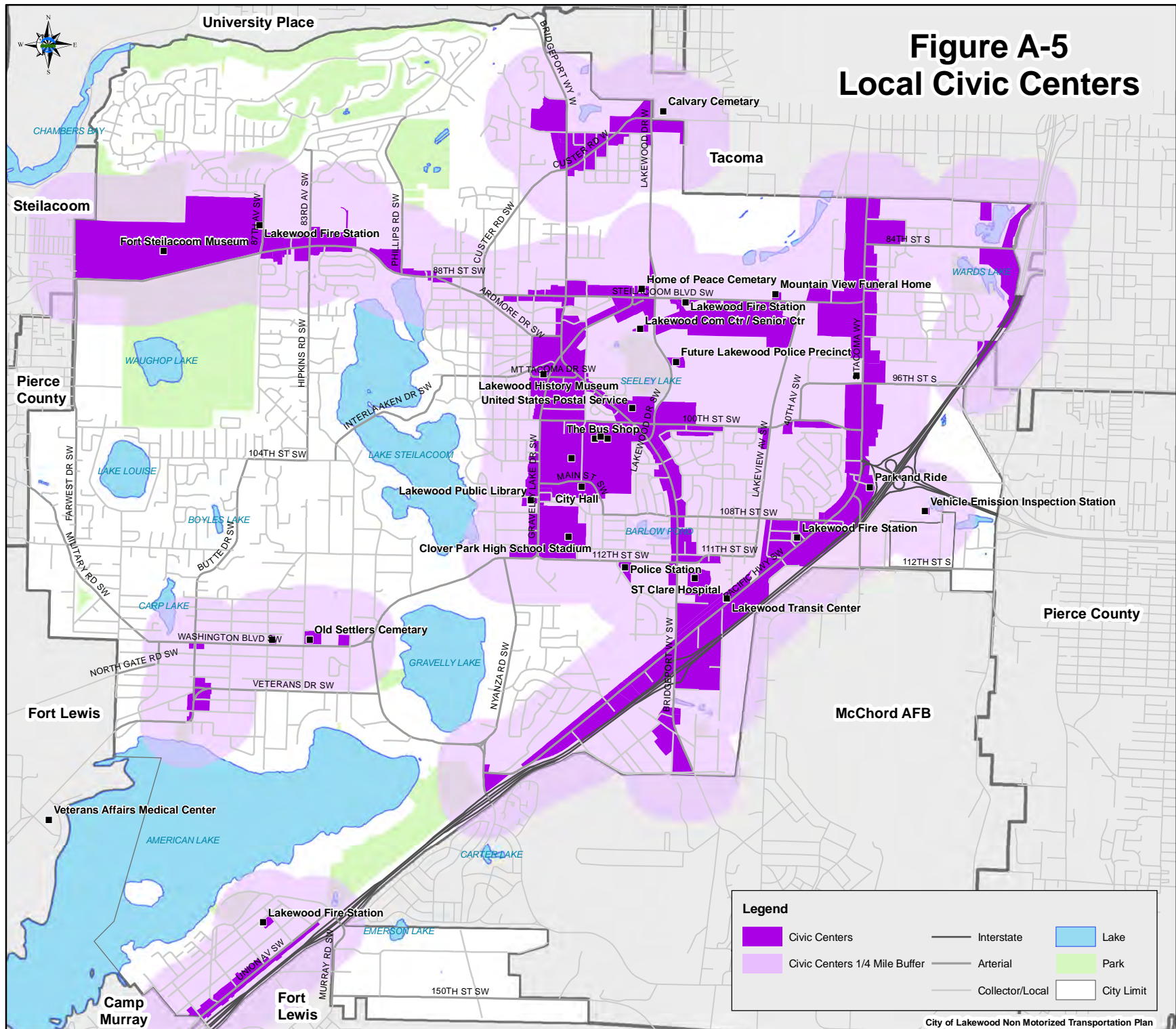
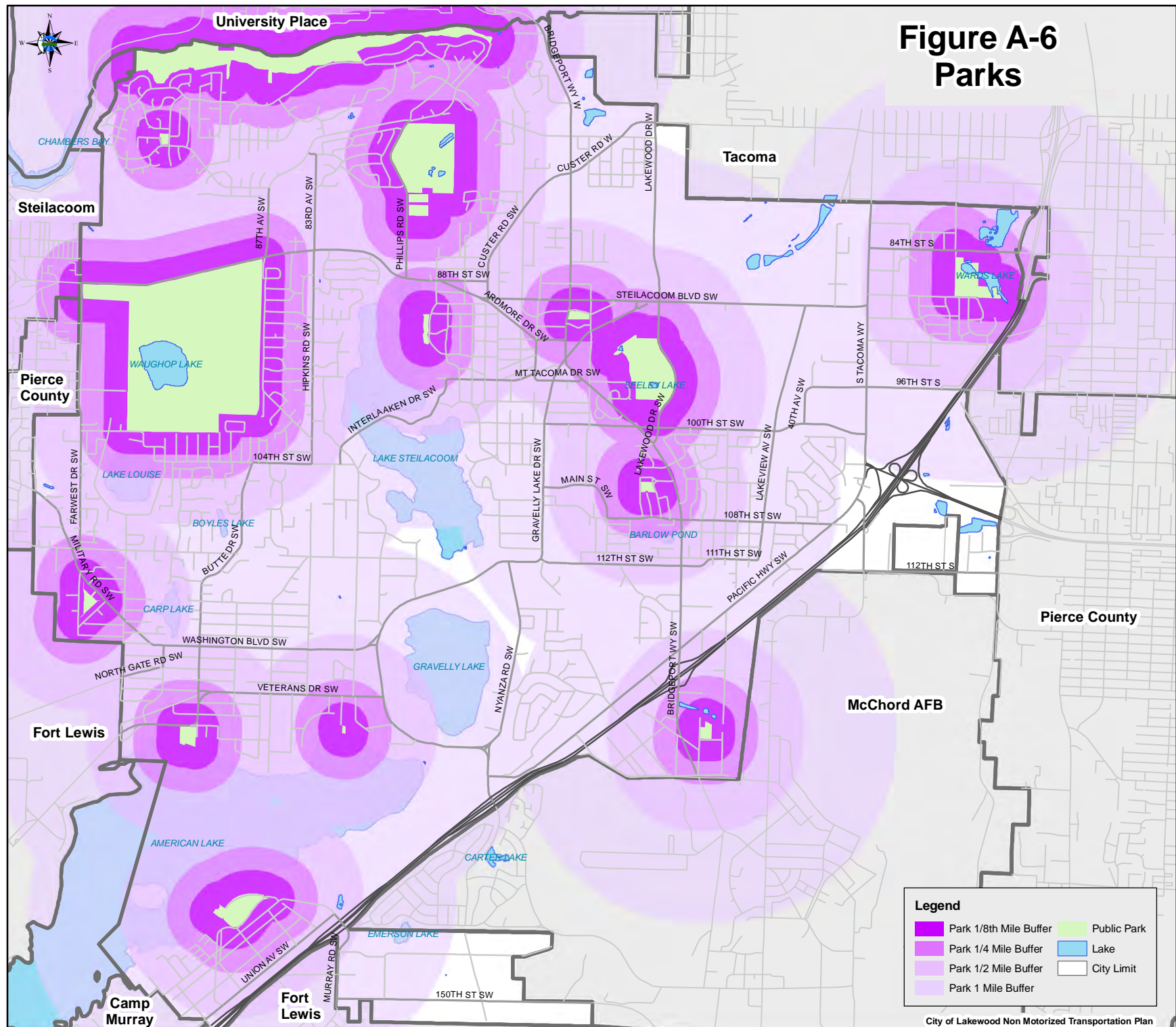


Figure A-6 Parks



**Figure A-7
Transit Routes & Bus Stops**

The map illustrates the transit network and bus stop locations within the City of Lakewood and its surrounding areas. Key features include:

- Transit Routes:**
 - Interstate:** Represented by a thick black line.
 - Arterial:** Represented by a medium-weight black line.
 - Local/Collector:** Represented by a thin black line.
- Bus Stop Buffers:**
 - Bus Route 50ft Buffer:** Indicated by a dark red line.
 - Bus Stop 1/8th Mile Buffer:** Indicated by an orange shaded area.
- Geographic Features:**
 - Lake:** Represented by a blue area.
 - Park:** Represented by a green area.
 - City Limit:** Represented by a white area.
- Key Locations and Roads:**
 - Steilacoom:** Located in the northwest, featuring Steilacoom Blvd SW and various local streets like 87th Av SW, 83rd Av SW, and 88th St SW.
 - Tacoma:** Located in the northeast, featuring Steilacoom Blvd SW and various local streets like 84th St S, 96th St S, and 97th Av SW.
 - Fort Lewis:** Located in the southwest, featuring American Lake and various local streets like 150th St SW and 151st St SW.
 - Camp Murray:** Located in the south, featuring American Lake and various local streets like 150th St SW and 151st St SW.
 - McChord AFB:** Located in the southeast, featuring various local streets like 112th St S and 112th St SW.

Legend

Interstate	Bus Route 50ft Buffer	Lake
Arterial	Bus Stop 1/8th Mile Buffer	Park
Local/Collector		City Limit

City of Lakewood Non Motorized Transportation Plan

Figure A-8 Traffic Signals & Roundabouts

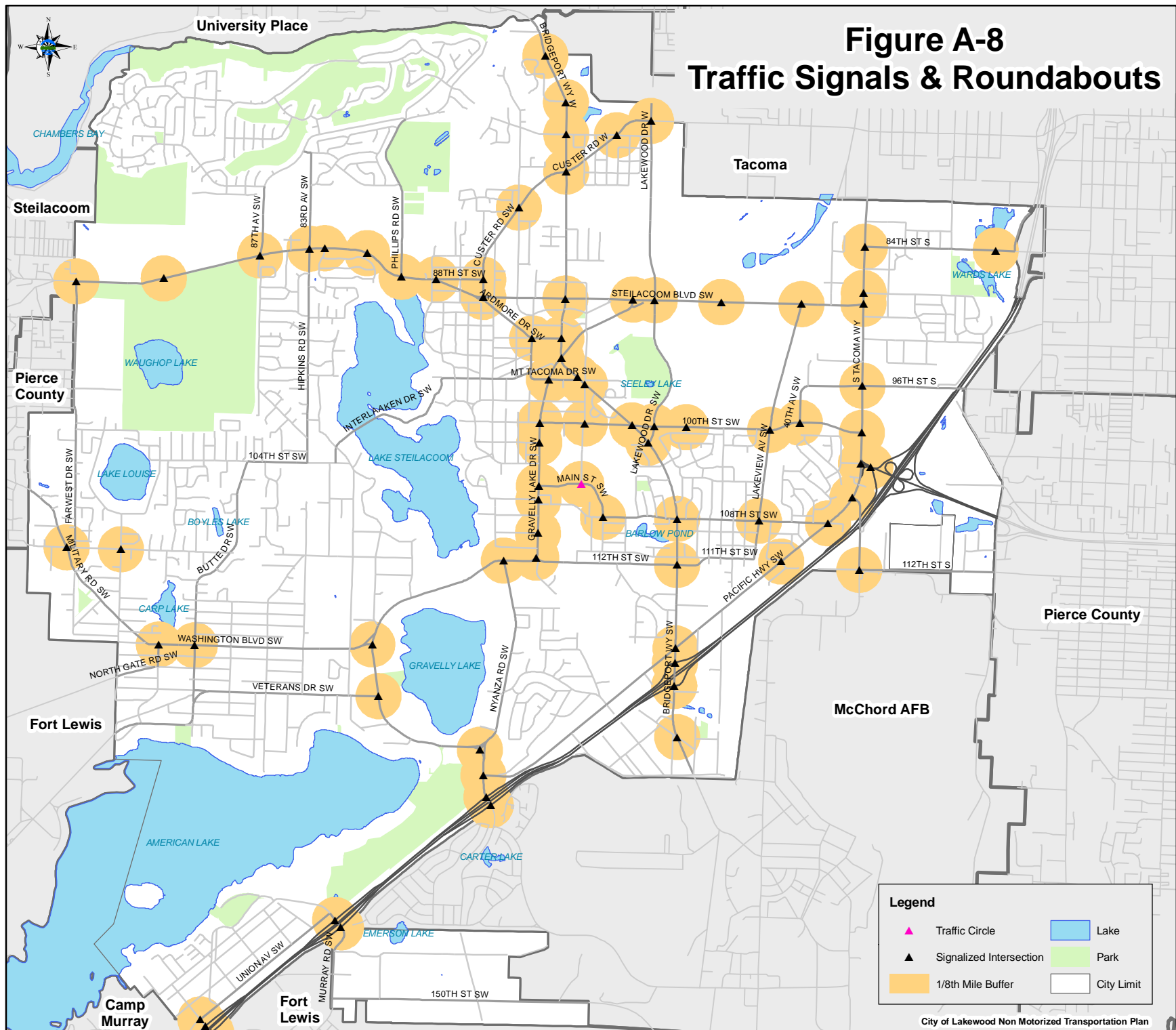


Figure A-9 Low Income

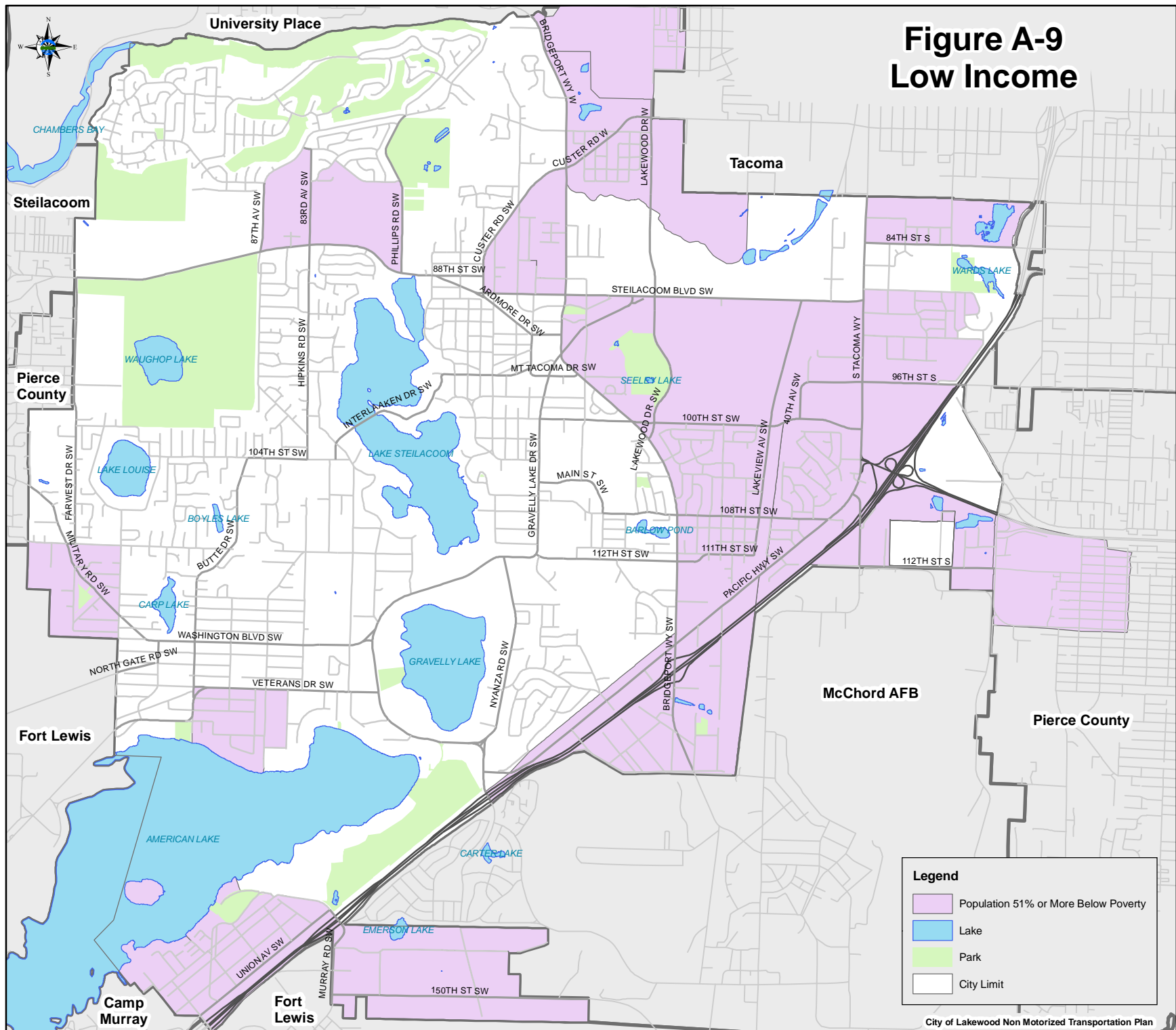


Figure A-10 Mobility Impaired Residents

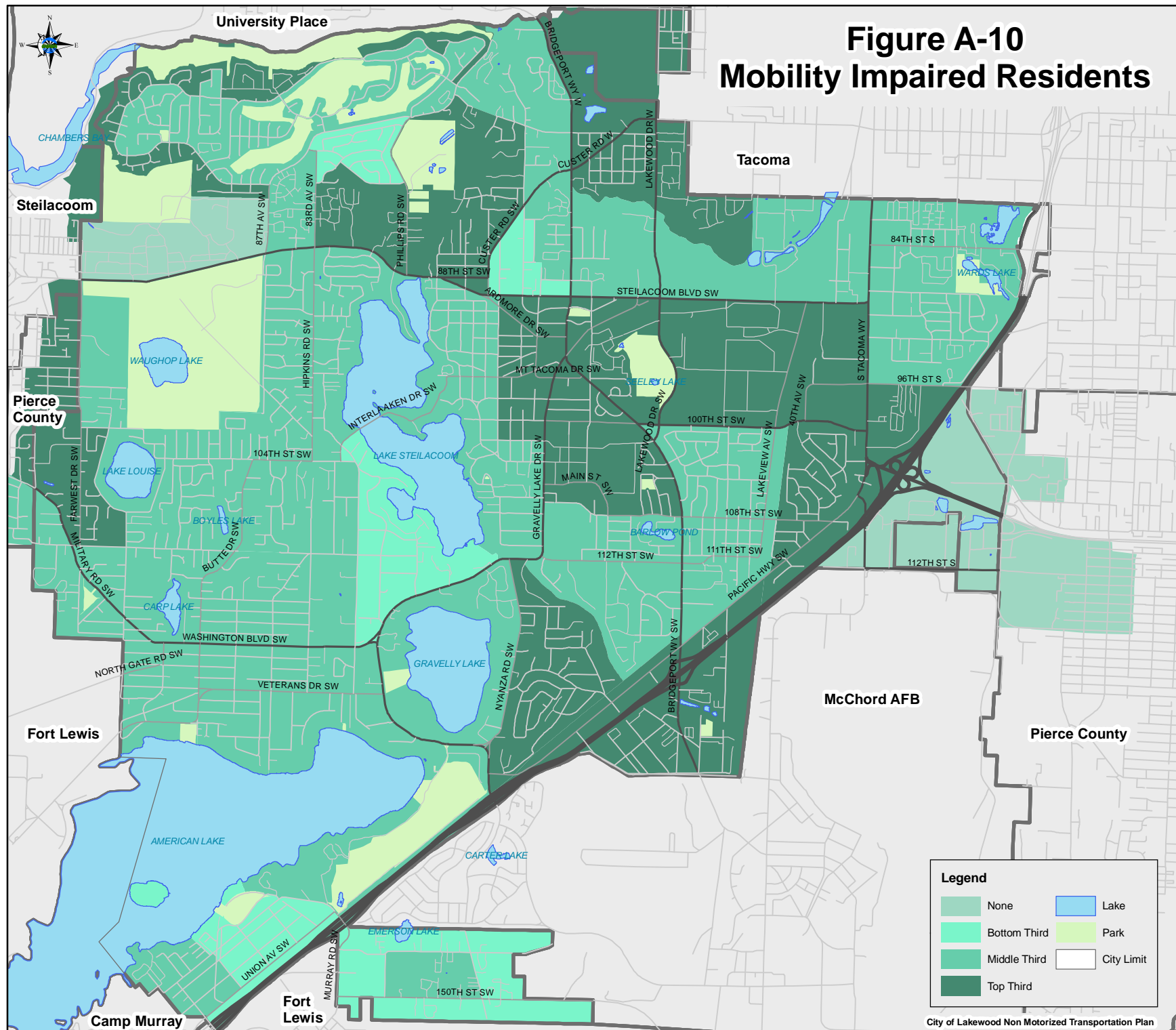


Figure A-11 Housing & Employment Density

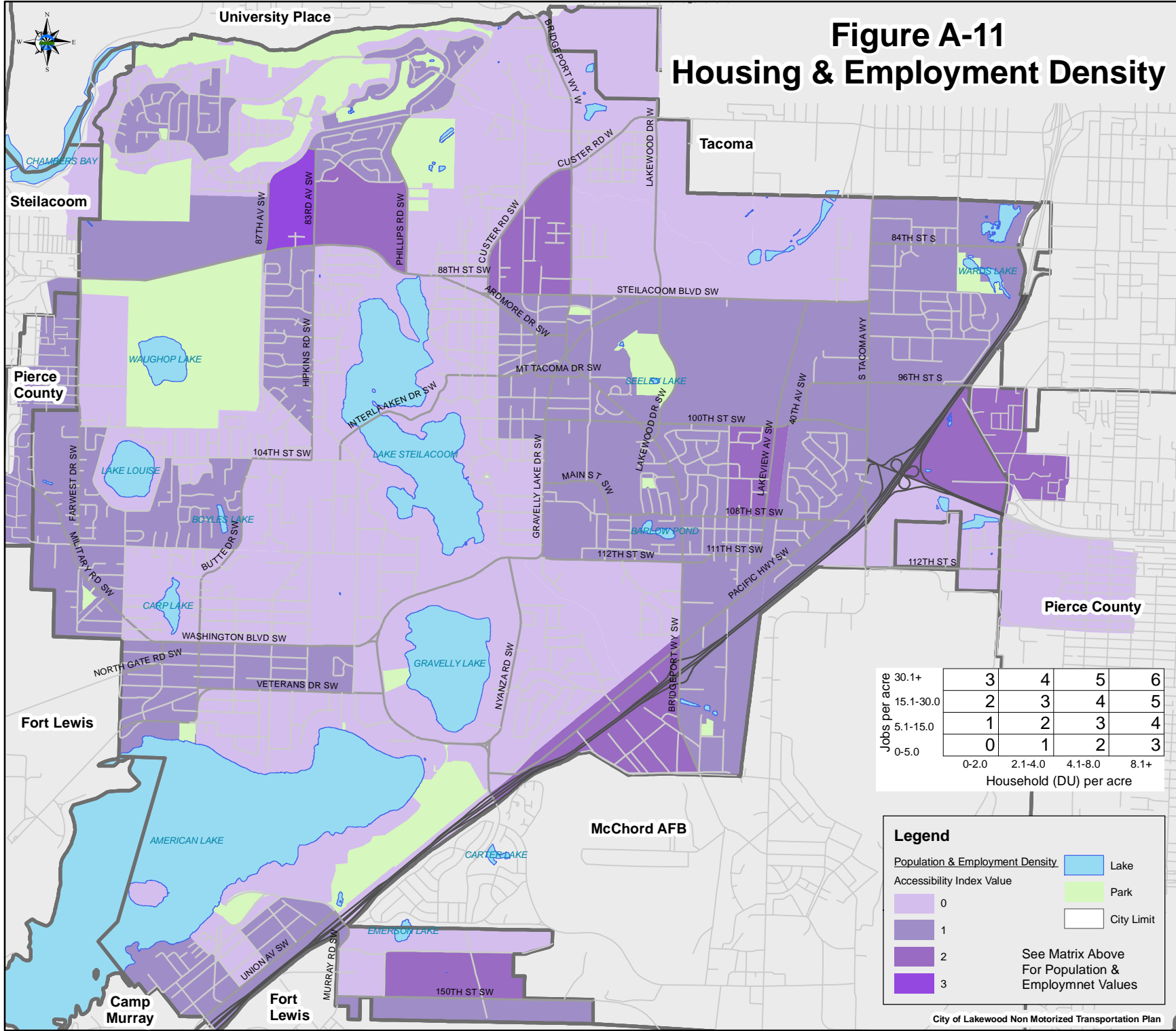


Figure A-12 Walk To Work Mode Share

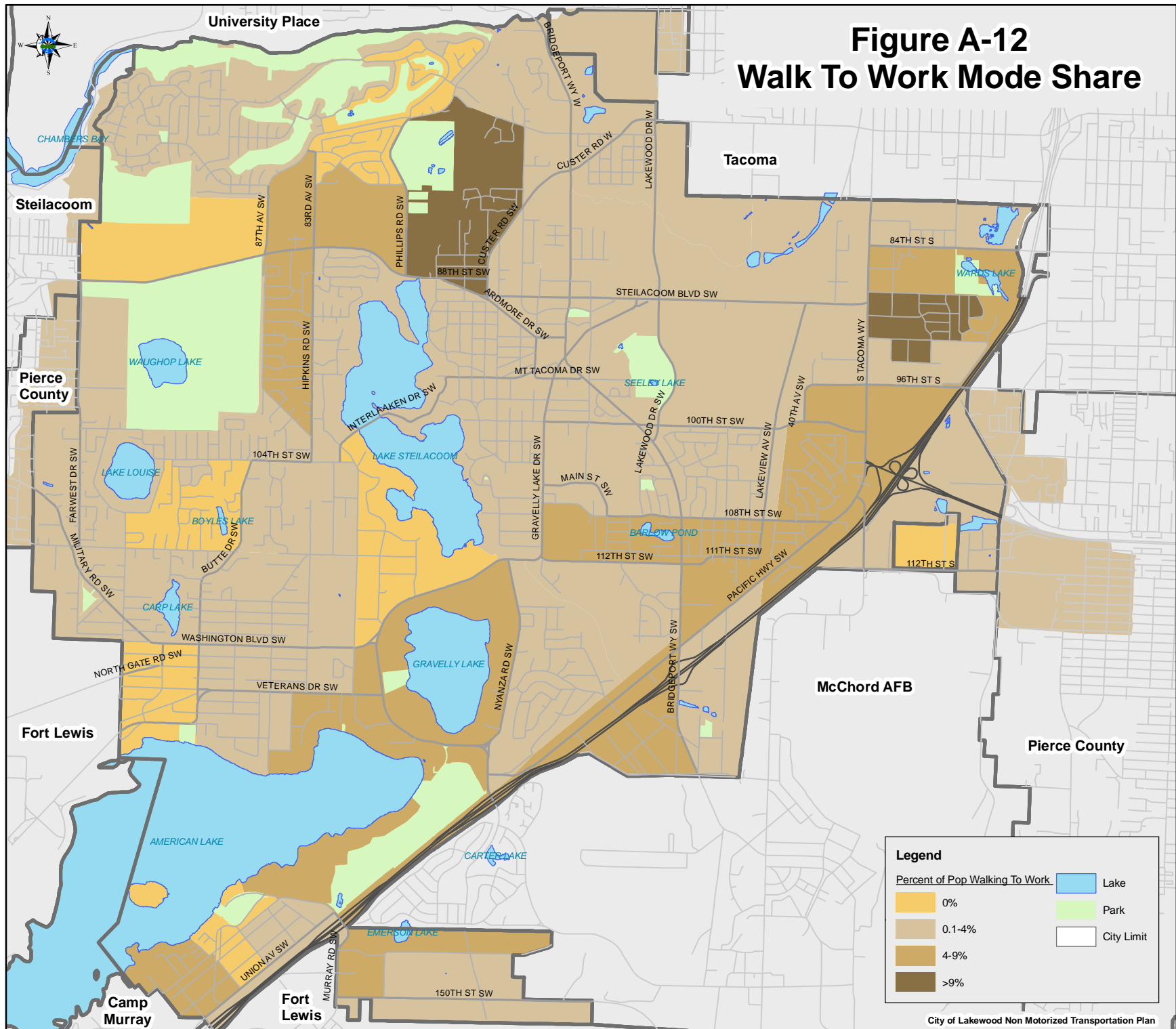


Figure A-13 Senior Housing

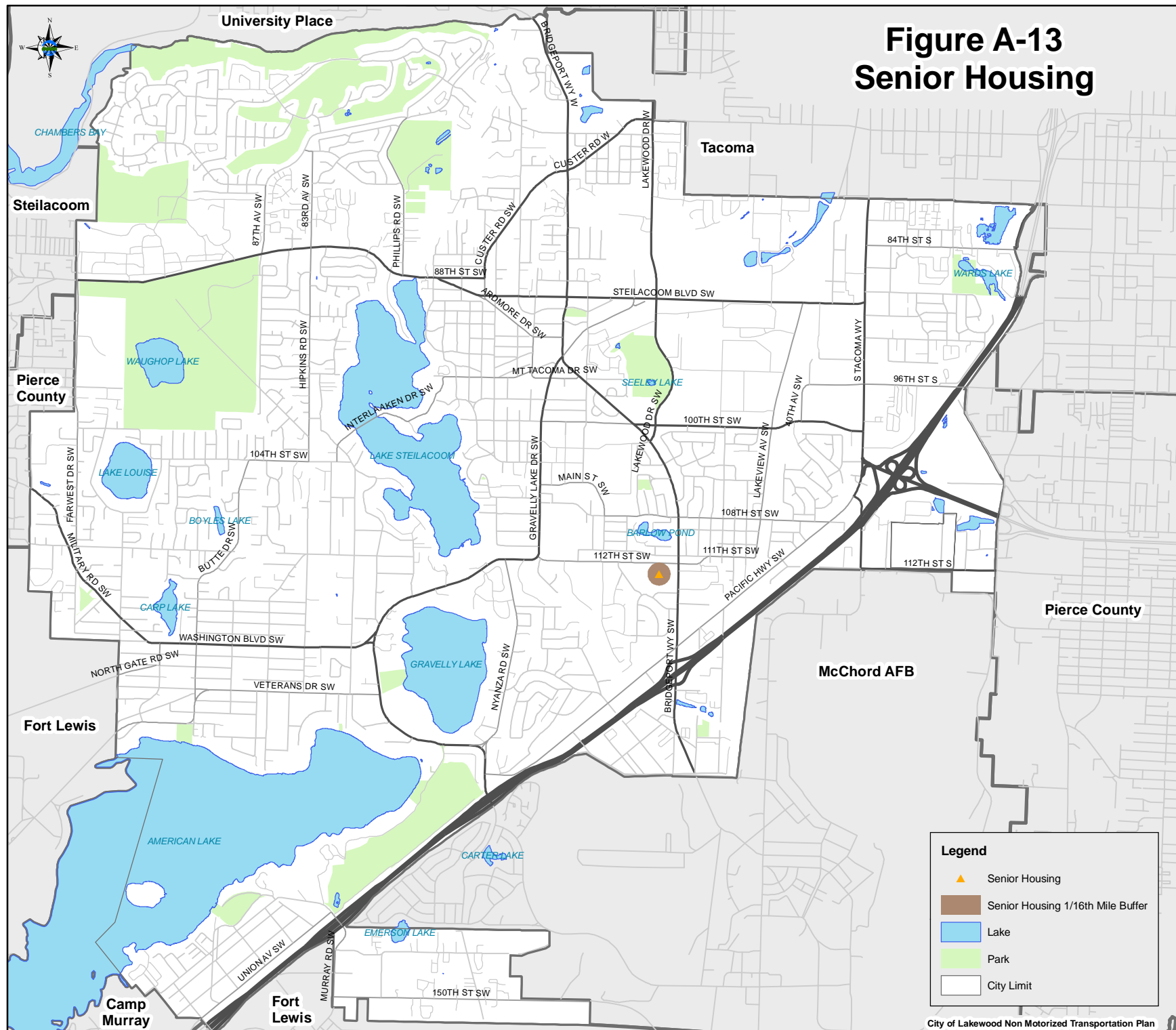
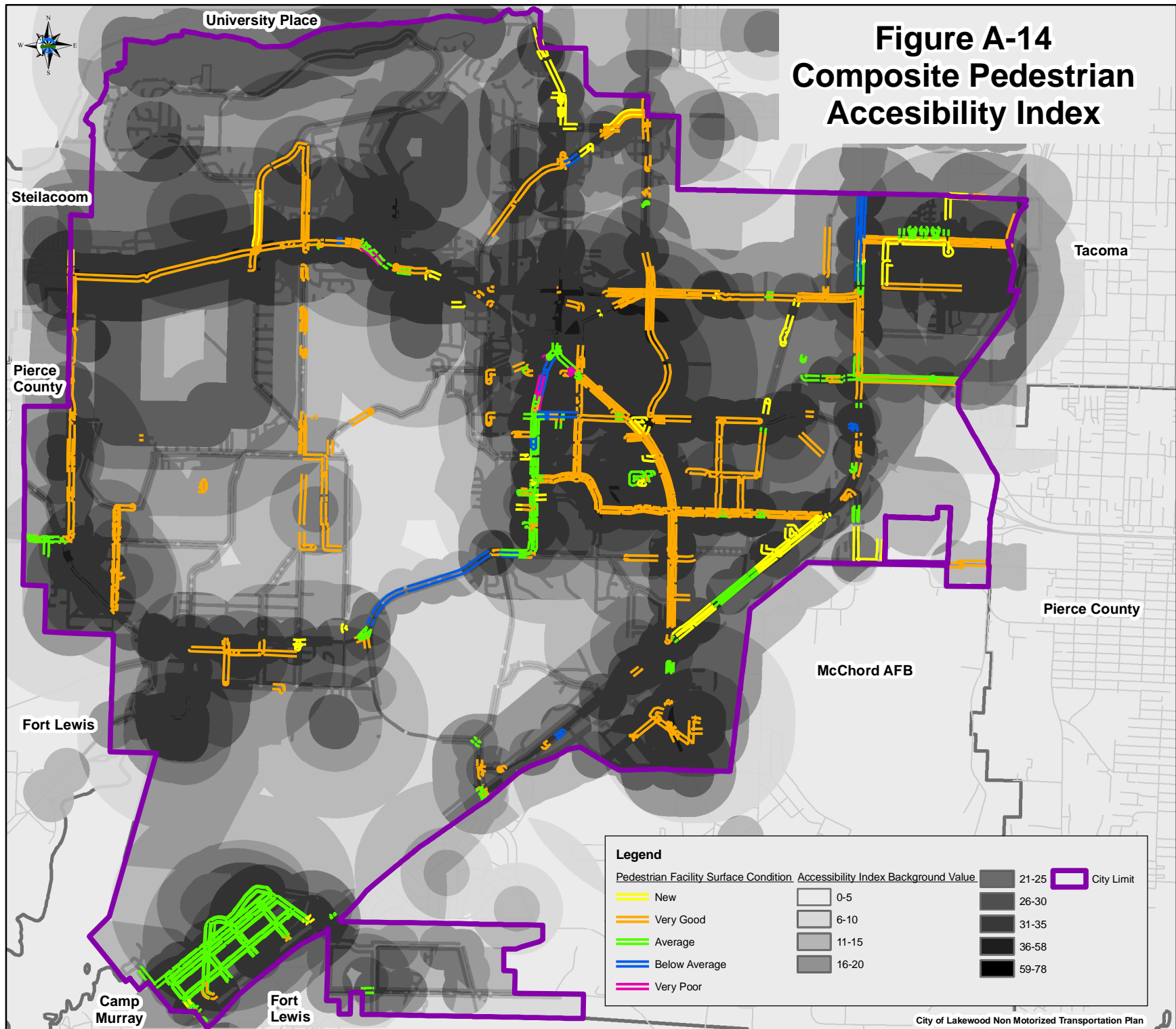


Figure A-14 Composite Pedestrian Accessibility Index



3 - ADA Transition Plan

Americans with Disabilities Act (ADA)

Lakewood Transition Plan: Pedestrian Corridors

The following is a general overview of the ADA requirements for Transition Plans to address Title II of the ADA as it applies to Lakewood's public rights of way which are to accommodate pedestrians; mainly street and shared-use path corridors. For the purposes of the Transition Plan, broad interpretation of the ADA is made here to distinguish the meaning of "program" accessibility inclusive of Lakewood's street and other pedestrian pathway corridors and rights of way.

The Americans with Disabilities Act (ADA) of 1990 provides comprehensive civil rights protections to qualified individuals with disabilities in the areas of employment, public accommodations, State and local government services, and telecommunications. A primary goal of the ADA is the equal participation of individuals with disabilities in the "mainstream" of American society. Title II of the Act took effect on January 26, 1992 and covers programs, activities, and services of public entities, including Lakewood, Washington. Most requirements of Title II are based on Section 504 of the Rehabilitation Act of 1973, which prohibits discrimination on the basis of disability in federally assisted programs and activities. The ADA extends Section 504's non-discrimination requirement to all activities of public entities, not only those that receive Federal financial assistance.

Under Title II, a public entity may not deny the benefits of its programs, activities, or services to individuals with disabilities because its facilities are inaccessible.

A public entity's programs, services, and activities, when viewed in their entirety, must be made readily accessible to and usable by individuals with disabilities, except where to do so would result in a fundamental alteration in the nature of the program; result in undue financial and administrative burdens or threaten or destroy the historic significance of an historic property. This standard, known as

"program accessibility" applies to all existing facilities of a public entity. Under this standard, the City of Lakewood is not required to make all its facilities or every part of a single facility accessible.

Program accessibility may be achieved by a number of methods, including but not limited to: alteration of existing (pedestrian) facilities to remove architectural barriers, the relocation of activities or services from inaccessible to accessible buildings, the redesign of equipment, assignment of aides to beneficiaries, home visits, or delivery of services at alternate accessible sites. When choosing a method of providing program access, priority is to be given to the one that results in the most integrated setting appropriate to encourage interaction among all users, including individuals with disabilities.

The (Transition) plan must:

- 1) List of the physical barriers in a public entity's facilities that limit the accessibility of its programs, activities, or services to individuals with disabilities.
- 2) Provide a detailed outline of the methods to be utilized to remove these barriers and make the facilities accessible;
- 3) Provide a schedule for taking the necessary steps to achieve compliance with Title II. If the time period for achieving compliance is longer than one year, the plan should identify the interim steps that will be taken during each year of the transition period; and,
- 4) The name of the official responsible for the plan's implementation.

Interested persons, including individuals with disabilities or organizations representing individuals with disabilities, are required to be provided an opportunity to comment on the Transition Plan. The plan must also be made available for public inspection for a period of three years.

This is an overview of the Transition Plan prepared by Lakewood. In many cases references are made in the Transition Plan to those pertinent sections of the Lakewood NMTP which addresses specific pedestrian facility inventory, design guide and system plan elements. The Transition Plan (by reference to sections of the NMTP) assesses the extent of architectural barriers to program accessibility on street

and shared-use path corridors (rights of way) operated by the City of Lakewood, estimates costs for their correction, sets priorities for their elimination, and provides a schedule for their removal.

List of Physical Barriers

The listing of physical barriers within Lakewood's pedestrian corridors (public rights-of-way) was prepared as a result of the Self-Evaluation (Chapter 2), design guidance (Chapter 6) and prioritization of pedestrian system improvements (Chapter 8) contained within the NMTP.

The method and design guidance used to conduct the Self-Evaluation is described in Chapter 2 of the NMTP. See copy of GPS-based Data Dictionary above, Appendix A.

The methodology for prioritization of pedestrian system improvements (which help remove existing barriers) is identified in NMTP Chapter 3.

A summary of the pedestrian system barriers is provided in **Table A-1** and **Figure A-15: ADA Self-Evaluation – Barrier Removal Map**. The map includes, in the following order:

1. Missing Sidewalks

- A. High Priority (42.8 miles – see tables below – based on Pedestrian Priority Index as defined in NMTP Chapter 3)
- B. All others streets with missing sidewalks

2. Missing Curb Ramps

- A. High Priority (40 curb ramps – see Table A-1)
- B. All others (83 curb ramps)

3. Curb Ramp Reconstruction

- A. High Priority (191 curb ramps) These “deficient” curb ramps to be replaced were already identified using the PPI as either (a) very poor surface, (b) non-compliant ramp width of less than 36 inches (c) non-compliant top landing as either missing of less than 36 inches or (d) non-compliant slope of 8.4% or greater.
- B. All Other Lower Priority. These “deficient” curb ramps to be replaced were also identified using the PPI as (a) very poor surface, (b) non-compliant ramp width of less

than 36 inches (c) non-compliant top landing as either missing of less than 36 inches or (d) non-compliant slope of 8.4% or greater. These curb ramps are found in lower priority areas of accessibility needs and are to be replaced when funding becomes available, or as part of other transportation improvement projects.

- C. Additional Barriers. In addition to “A” and “B” above, the following criteria are used to identify other curb ramp barriers, for those ramps that are:
 - Any remaining ramp where ‘Cross_Slope’ = > 2%....then
 - Any remaining ramp where ‘Alignment’ = “Angle”

The total of Lower Priority and Additional Barrier curb ramps identified in the Self-Evaluation is 159). Removal of these barriers by replacement curb ramps are recommended in the NMTP, to be completed when funding becomes available, or as part of other transportation improvement projects in the City's TIP.

Furthermore, a total of 110 existing curb ramps, otherwise considered ADA compliant, have “lips” equal to or greater than ¼ inch, and are not identified or scheduled to be repaired as part of the city's TIP or NMTP. As part of its regular and current TIP maintenance program the City of Lakewood should repair these lips through simple pavement or grinding to ensure a clean surface for the transition of mobility-impaired pedestrians.

4. Pedestrian Button

- A. Rated “deficient” as part of the Self-Evaluation
These pedestrian buttons are included in Lakewood's NMTP.

In the original NMTP GIS analysis (Chapter 3) new sidewalk needs, new curb ramp needs and curb ramp replacement needs were prioritized based on proximity to several pedestrian system features and activities, based on community input.

Methods Used to Remove Barriers

The two principle methods to remove barriers in Lakewood's pedestrian corridors (public rights-of-way) include (a) revisions to design standards to enhance pedestrian accessibility, (b) recommended and prioritized pedestrian system projects through new sidewalks and curb ramps or replacement sidewalks and curb ramps that enhance accessibility.

Recommended refinements to the city's pedestrian design standards are identified in NMTP Chapter 6 – Local Non-Motorized Design Guide.

The recommended Pedestrian System Plan includes prioritized new sidewalks, new curb ramps, curb ramp replacement and shared-use path improvements included in NMTP Chapter 8. The combination of these projects helps provide accessible pedestrian facilities along the city's most critical corridors.

In Chapter 8 (Pedestrian and Bicycle System Plans), the NMTP identifies over \$40 million in street improvement costs for urban street upgrades which add curb, gutter and sidewalks to existing arterials and collectors. These projects are recommended for Lakewood to consider in its update of the Transportation Master Plan. Many of these projects will result in the removal of pedestrian barriers (missing sidewalks and curb ramps, substandard curb ramps, etc.).

The NMTP also identifies almost \$26 million in new sidewalks, almost \$1 million in sidewalk repairs and \$600,000 in new or replacement curb ramp improvements. These projects were the result of the mapping analysis targeting the highest accessibility needs within the city (see Chapter 3 of the NMTP). The combination of these projects will significantly remove barriers to pedestrian travel in Lakewood, particularly along critical corridors in higher areas of pedestrian activity, often supportive of greater access to public transportation and civic centers and public facilities.

As shown in Table A-1, the city's current TIP and proposed NMTP sidewalk improvement projects will dramatically impact and reduce the number of independent pedestrian curb ramp barriers (non-compliant and missing curb ramps) by their construction of

replacement ramps or new curb ramps as part of either the TIP street projects or recommended street upgrade, new sidewalk and sidewalk repair projects identified in the NMTP (see Chapter 8).

Table A-1: ADA Self-Evaluation – Curb Ramp Summary

		Number Curb Ramps		
		Lakewood NMTP Pedestrian Priority Index (PPI)		
		High	Medium	Low
a	Self-Evaluation Summary	397	240	490
b	Level I ADA Barriers	143	51	37
c	Level II ADA Barriers	48	31	40
d	ADA Non-Compliant Ramps (b+c)	191	82	77
e	ADA Compliant Ramps (a-d)	206	158	413
f	ADA Non-Compliant Ramps	191	82	77
<i>Less Ramp Replacement Projects as part of.....</i>				
g	TIP Projects	3	8	13
h	NMTP Urban Street Upgrades	23	6	6
i	NMTP Sidewalk Projects	1	3	
j	NMTP Sidewalk Repair Projects	10	1	3
k	Subtotal (g+h+i+j)	37	18	22
l	Stand-Alone Curb Ramp Replacements (f-k)	154	64	55
m	Missing Curb Ramps	40	35	48
<i>Less New Ramp Construction as part of.....</i>				
n	TIP Projects		14	11
o	NMTP Urban Street Upgrades	23	9	6
p	NMTP Sidewalk Projects	7		
q	NMTP Sidewalk Repair Projects	6		
r	Subtotal (n+o+p+q)	36	23	17
Stand-Alone New Curb Ramps (m-r)		4	12	31

Schedule for Barrier Removal

The City of Lakewood has limited funding to implement the findings and recommendations of the NMTP. It is anticipated that the NMTP recommendations for high priority improvements can be accomplished within a 20-year planning horizon, as funding is available. Not all identified barriers will be removed within the first year of the NMTP. Further, some local streets that are identified as missing sidewalks may never be constructed with new sidewalks; where local land owners may chose to retain the current street travel lanes(s) and/or shoulder as the accepted pedestrian facility. Table A-2 lists the general schedule to remove barriers within Lakewood's pedestrian corridors.

Table A-2: Pedestrian Corridor Barrier Removal Schedule

	#	Unit	Schedule
New Streets w/ Sidewalks	14	Projects	see 6-Yr TIP ¹
Streets Upgrades w/ Sidewalks	25	SW Miles	NMTP/ 20-Yr ²
New Sidewalks – High Priority	17.8	SW Miles	NMTP/ 20-Yr
Sidewalk Repairs – High Priority	5.2	SW Miles	NMTP/ 20-Yr
Replace Curb Ramps – High Priority	154	Ramps	NMTP/ 20-Yr
New Curb Ramps – High Priority	4	Ramps	NMTP/ 20-Yr
Pedestrian Button Replacement	43	Ped Button	NMTP/ 20-Yr
New Shared-Use Paths	6.7	Miles	NMTP
Replace Curb Ramps – Lower Priority	119	Ramps	Upon Request & Available Funding
New Curb Ramps – Lower Priority	43	Ramps	Upon Request & Available Funding
Curb Ramp Lip Removal	110	Ramps	On-going Maintenance/TIP
New Sidewalk – Lower Priority	208	SW Miles	Upon Request & Available Funding
Sidewalk Repairs – Lower Priority	45	SW Miles	Upon Request & Available Funding

Interim steps (Taken Annually)

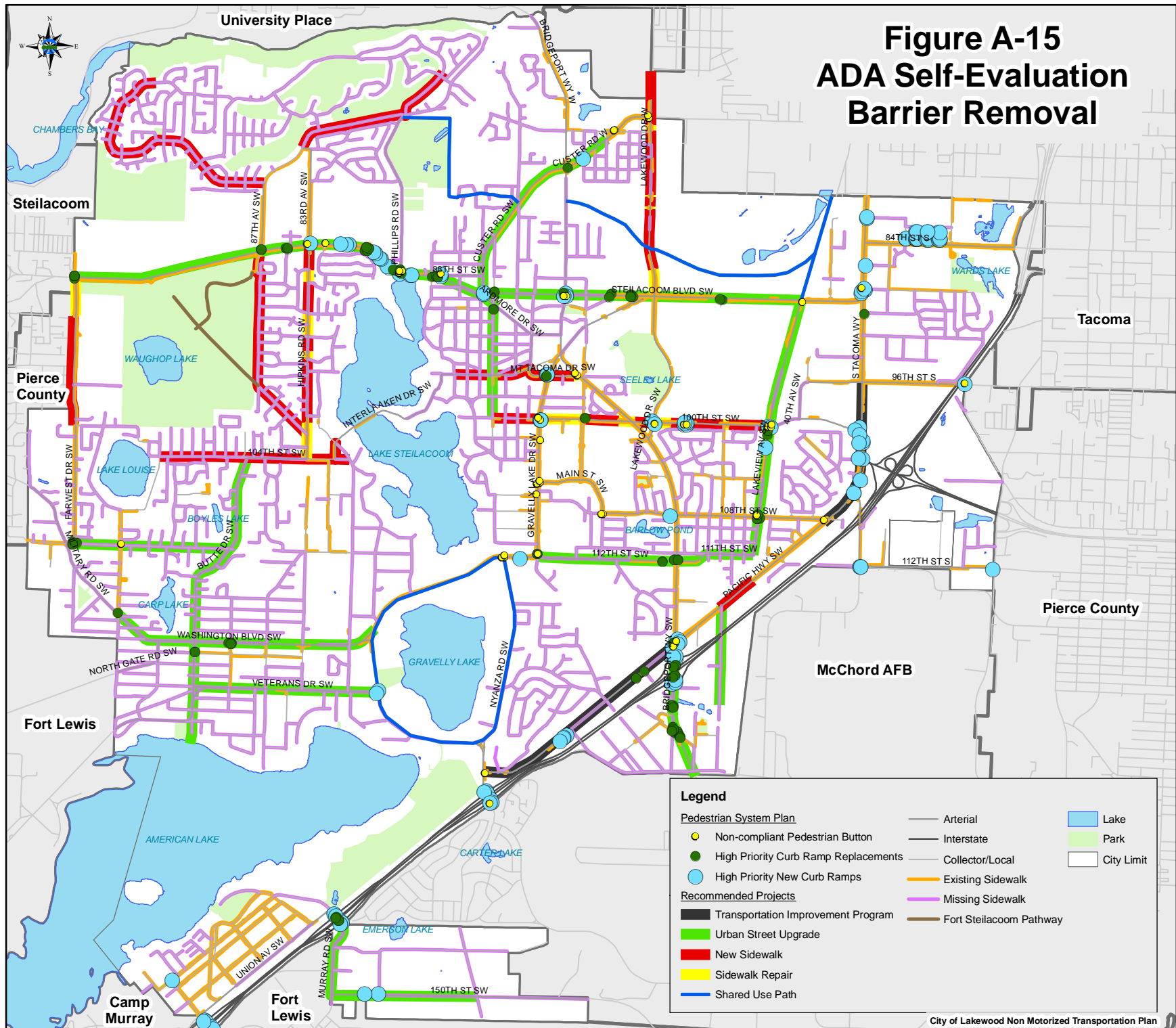
Lakewood currently administers its own policy to include approximately \$15,000 annually within its Transportation Improvement Plan (TIP) for Neighborhood Traffic Calming measures, available for curb ramp replacement projects at the request of individuals, likely on a first-come, first-serve basis.

The TIP is updated annually in consideration of revised transportation needs and available funding.

Name of Official Responsible

Chapter 9 of the NMTP includes a recommendation for the designation of an ADA Coordinator.

Figure A-15 ADA Self-Evaluation Barrier Removal



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Non-Motorized Transportation Plan



Appendix B – Steering Committee Pedestrian Priority Rankings

Index Criteria	Location Rating	Point Value	Possible Score	Committee Preference
ATTRIBUTE INDEX	<i>Calculation of all scores summarizing Rating of Existing Conditions</i>		35	
ACCESSIBILITY INDICES		Total		
Schools		10	10	20
Proximity to Schools	Within 1/8-mile radius of school	5		7
Walk-To-School Route	Within 50 feet on either side of route	5		13
Central Business District	Within 1/4-mile radius of civic/commercial center	5	5	2
Local Business/Civic Centers	Within 1/4-mile radius of neighborhood centers	5	5	14
Parks	Within 1/8-mile radius of park	5	5	14
Transit		5	5	13
Transit Route	Within 50 feet on either side of route	1		
Transit Bus Stops	Within 1/8-mile of transit stop	4		
Traffic Signal/Roundabout	Within 1/8-mile of signal or roundabout	5	5	6
Street Functional Class	(route continuity – accessibility)	5	5	13
Principal	Within 50 feet on either side of street	5		13
Minor Arterial	Within 50 feet on either side of street	4		10
Collector	Within 50 feet on either side of street	3		5
Local	(all other)	1		0
Lower Income Residence	Within Census Tract – below poverty line	5	5	1
Disabled Residents	Top Third (US Census Density*)	5	5	7
Population / Employment Density	Per Matrix (see attached)	6	6	2
Senior Housing	Within 1/16-mile radius of Senior Housing site	5	5	7
Walk-To-Work	Within Census Tract/Block Group	5	5	4
COMPOSITE ACCESSIBILITY INDEX			66	103
COMPOSITE PEDESTRIAN PRIORITY INDEX			101	138

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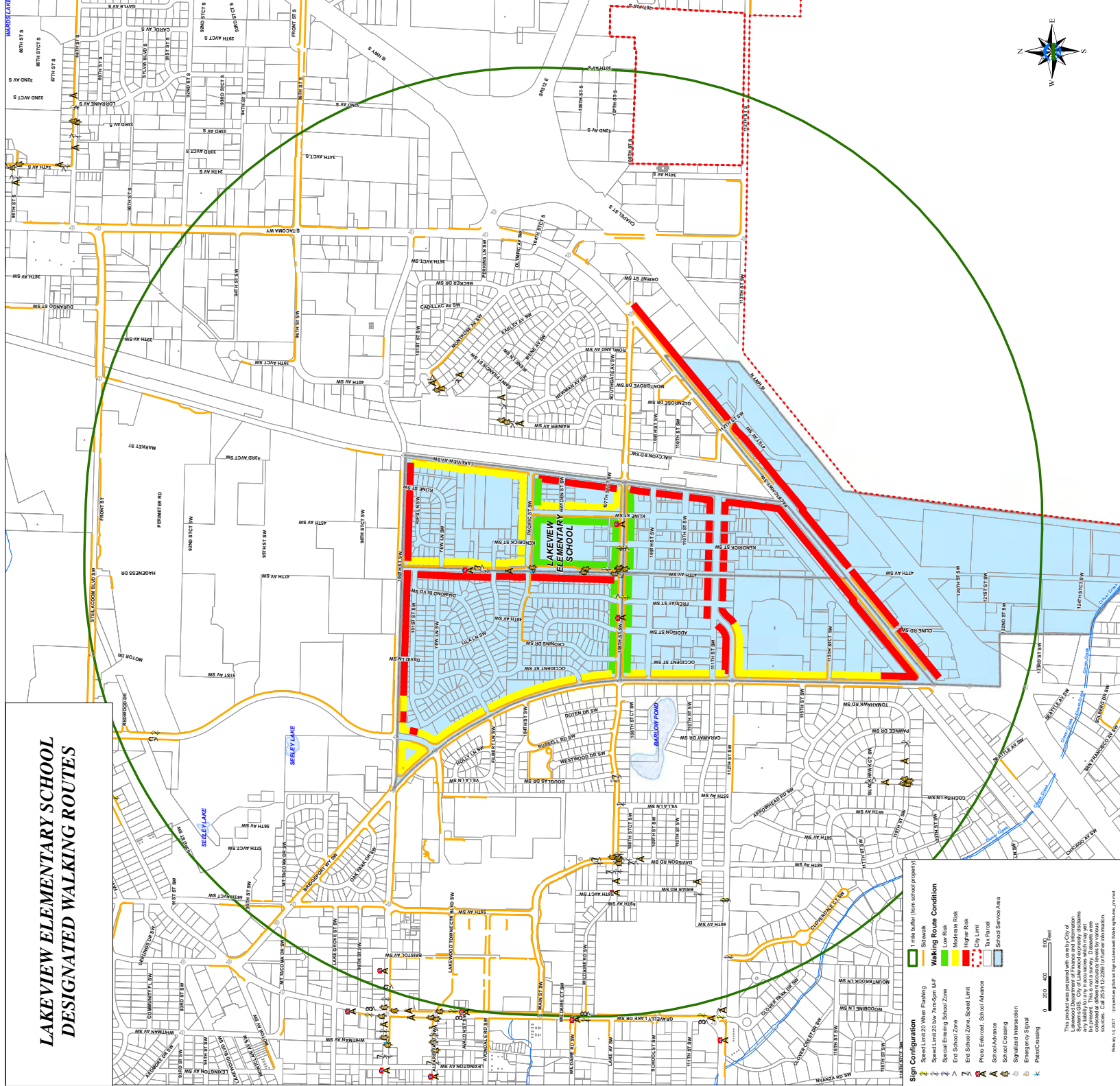


Non-Motorized Transportation Plan



Appendix C – Walk To School Route Mapping Examples

LAKEVIEW ELEMENTARY SCHOOL DESIGNATED WALKING ROUTES



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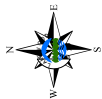
TILlicum ELEMENTARY SCHOOL DESIGNATED WALKING ROUTES

AMERICAN LAKE

EMERSON LAKE

WOODBROOK
MIDDLE
SCHOOL

TILlicum
ELEMENTARY
SCHOOL



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October 6, 2008
 ;project\eng\School Signs\TillicumESWalkingRoutes8.5x11_mrs.mxd

0 0.125 0.25 0.5 Miles

Sign Configuration

- Speed Limit 20 When Flashing
- Speed Limit 20 b/w 7am-5pm M-F
- Special Entering School Zone
- End School Zone
- End School Zone, Speed Limit
- Photo Enforced, School Advance
- School Advance
- School Crossing
- Signalized Intersection
- Emergency Signal

Walking Route Condition

- Low Risk
- Moderate Risk
- Higher Risk
- Sidewalk
- 1 mile buffer (from school property)
- City Limit
- Tax Parcel
- School Service Area

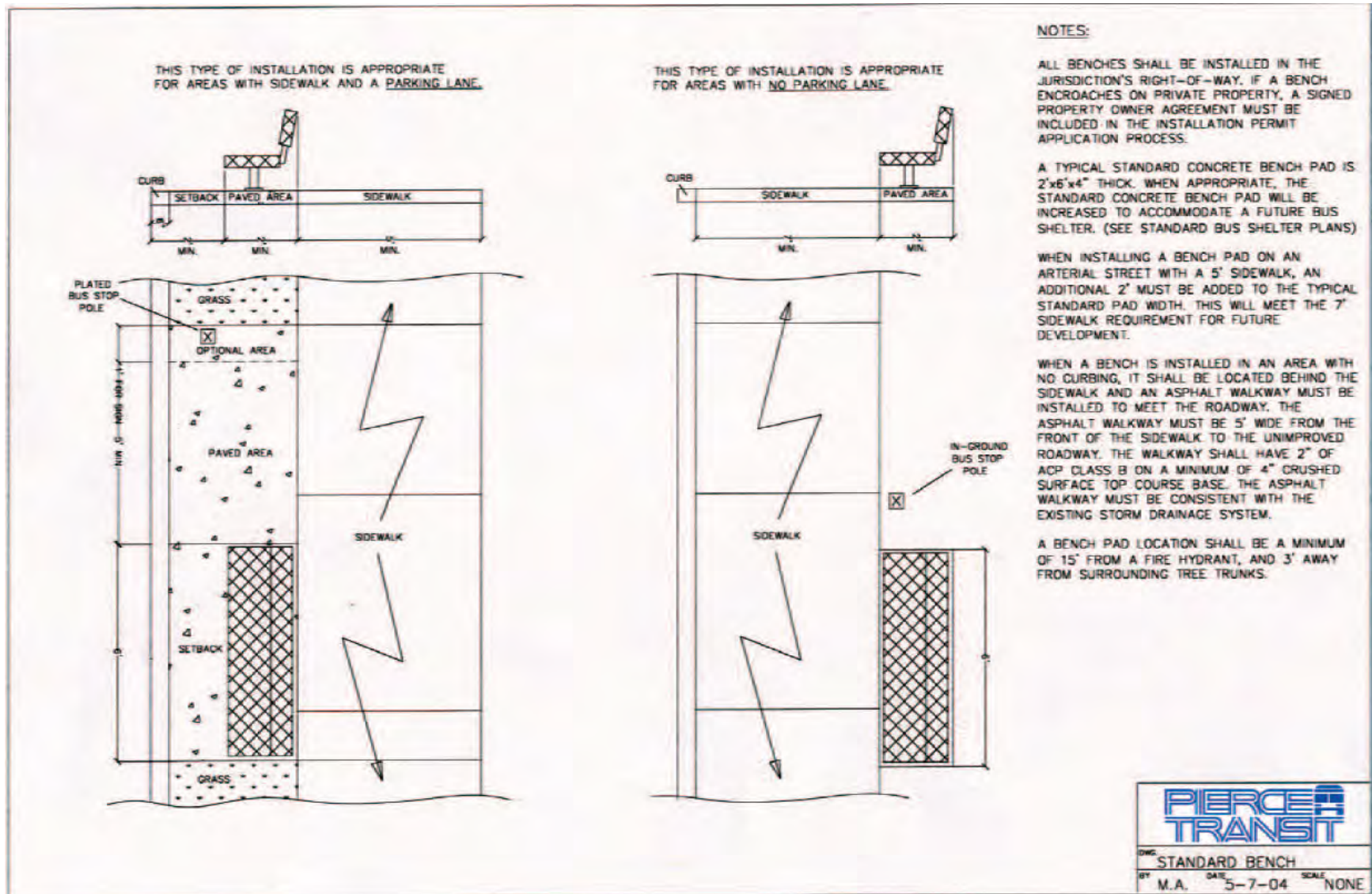


Non-Motorized Transportation Plan

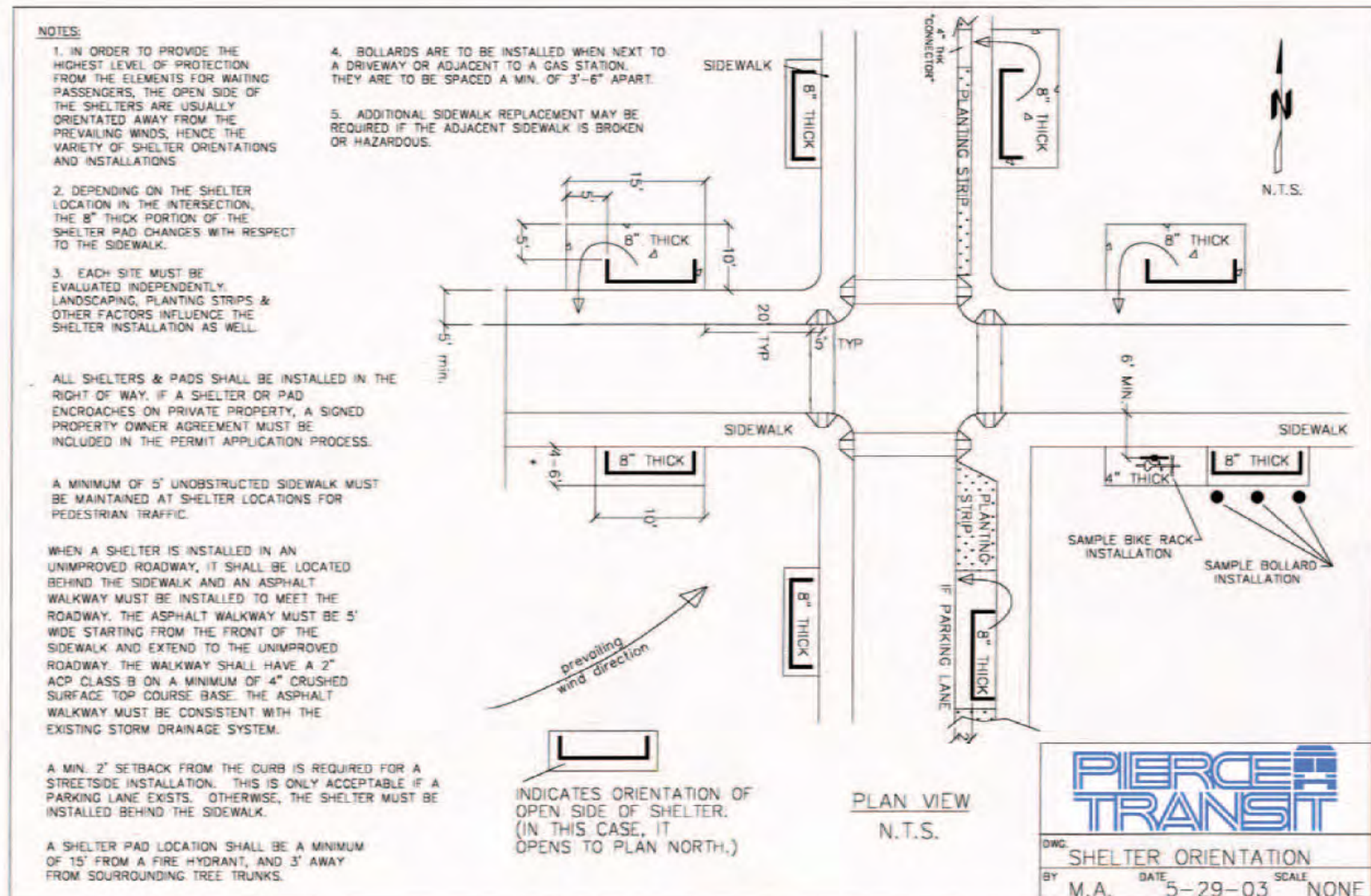


Appendix D – Pierce Transit Bus Stop Standards

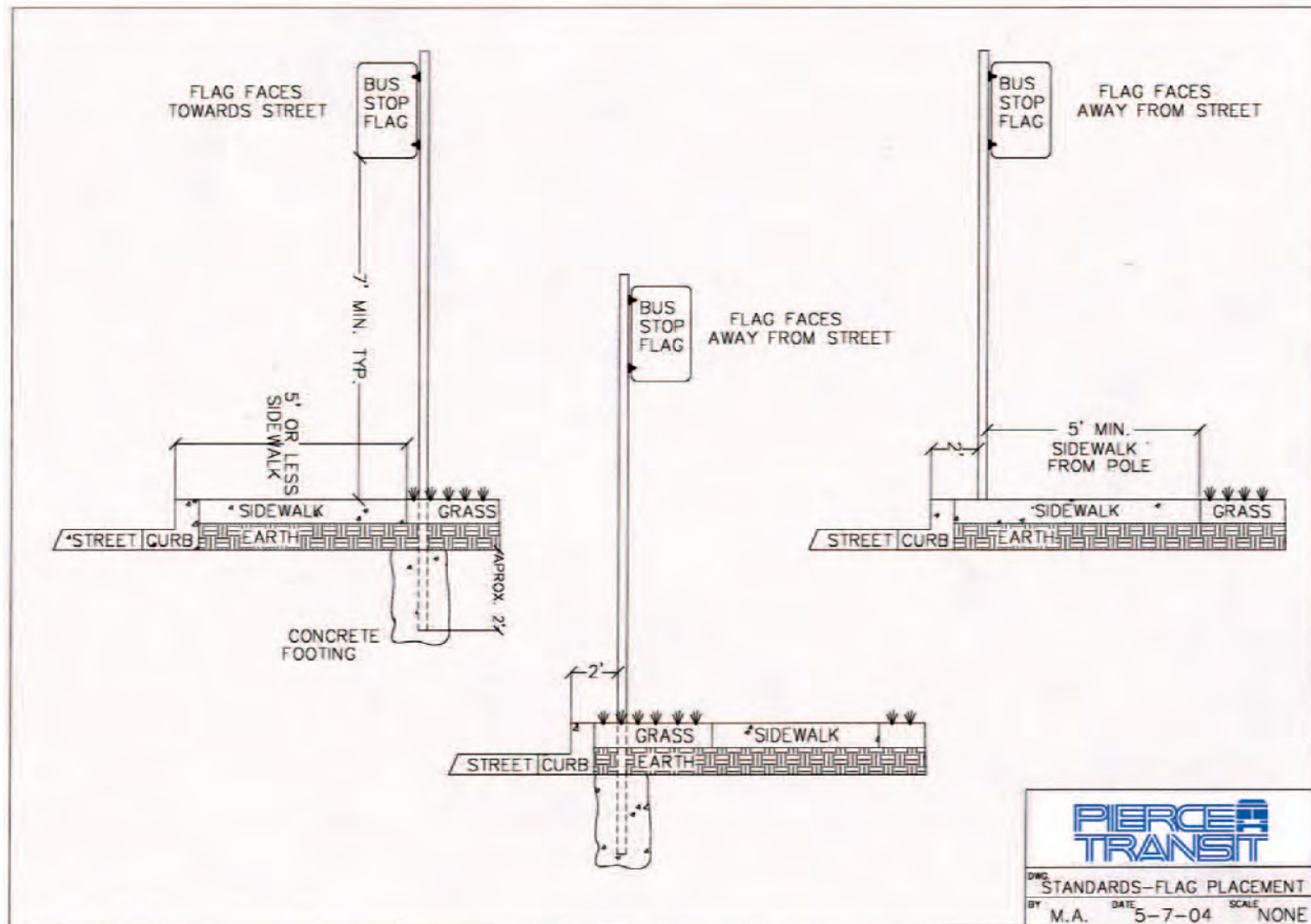
Standard Bench



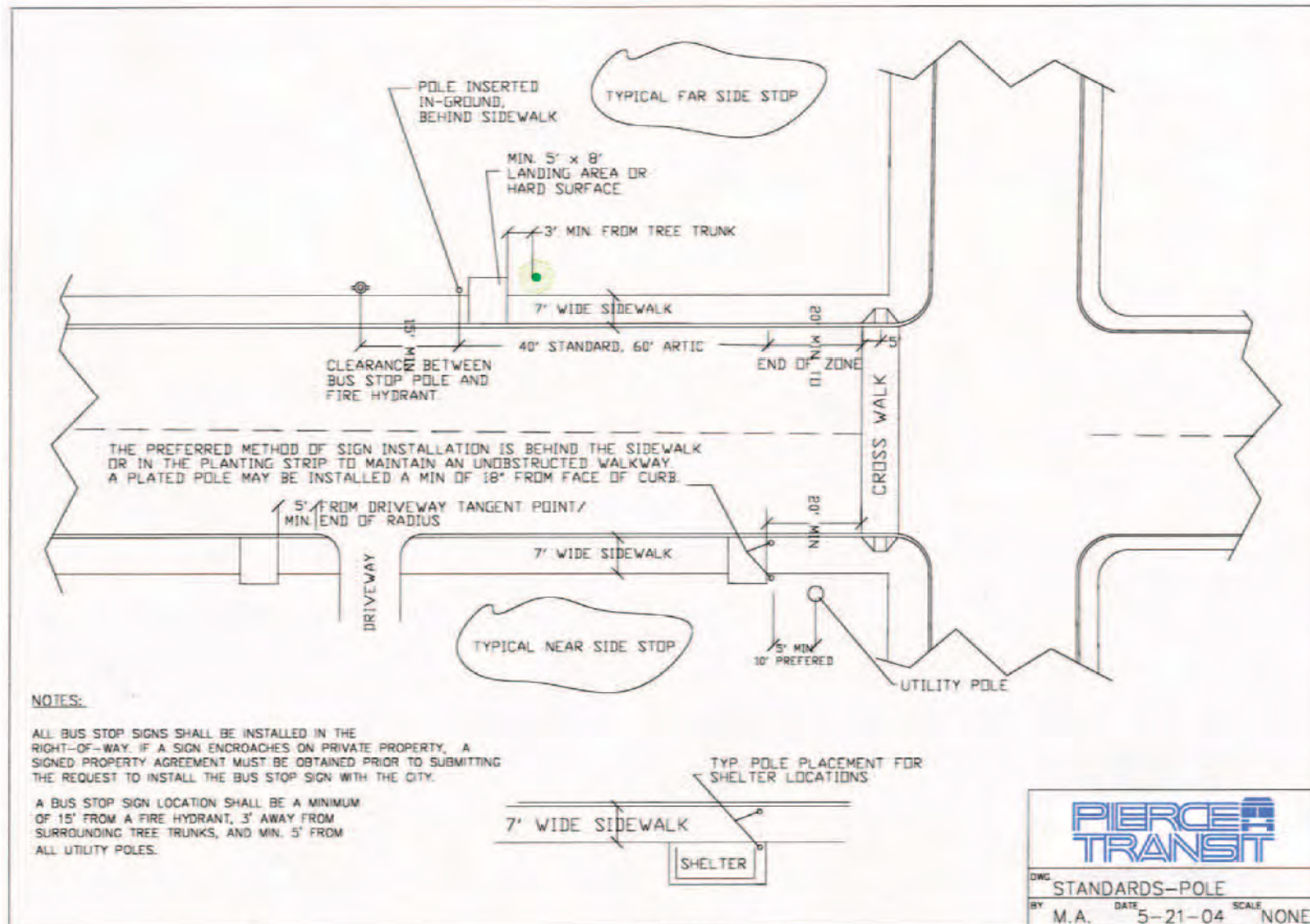
Shelter Orientation



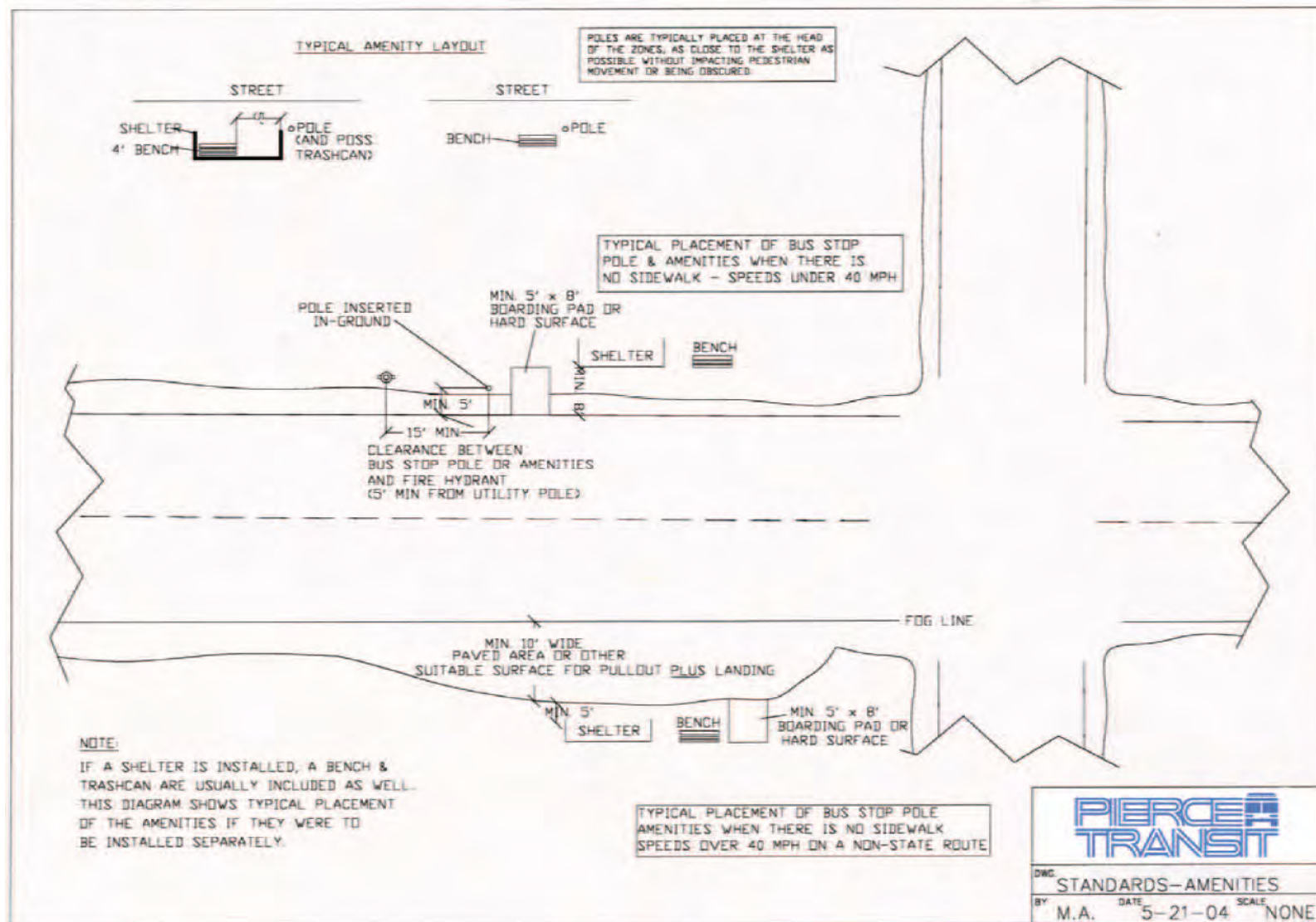
Flag Placement



Pole Placement



Amenities





Non-Motorized Transportation Plan



Appendix E Tacoma-Pierce County Board of Health / Complete Streets Policy

Appendix E Tacoma-Pierce County Board of Health / Complete Streets Policy

TACOMA-PIERCE COUNTY BOARD OF HEALTH ENDORSING THE ADOPTION AND IMPLEMENTATION OF COMPLETE STREETS POLICIES BY MUNICIPALITIES IN PIERCE COUNTY

WHEREAS “Complete Streets” are defined as roadways that enable safe and convenient access for all users, including pedestrians, bicyclists, transit riders, and motor vehicle drivers of all ages and abilities; and

WHEREAS Complete Streets policies are implemented when transportation agencies routinely design, construct, operate, and maintain the transportation network to improve travel conditions for bicyclists, pedestrians, transit and freight in a manner consistent with, and supportive of, the surrounding community; and

WHEREAS transportation improvements that are recognized as contributing to Complete Streets include: narrow vehicular travel lanes, sidewalks, bicycle lanes, wide shoulders, raised medians, raised crosswalks, audible pedestrian signals, sidewalk bulb-outs, street and sidewalk lighting, sidewalk curb cuts in compliance with the Americans with Disabilities Act, street furniture, transit pullouts, transit lanes, street trees and landscaping; and

WHEREAS Complete Streets may be achieved through single projects or incrementally through a series of smaller improvements or maintenance activities over time; and

WHEREAS, streets constitute a large portion of public space and should be corridors for all modes of transportation, including pedestrians, bicycles, and transit; and

WHEREAS, streets that support and invite multiple uses, including safe, active, and ample space for pedestrians, bicycles, and transit, are more conducive to the public life and efficient movement of people than streets designed primarily to move automobiles; and

WHEREAS the American Public Health Association, National Association of City and County Health Officials, Association of State and Territorial Health Officials, and the Institute of Medicine, have formally recognized linkages between the built environment and human health and call on public health officials to engage in local and regional land use and transportation planning and policy making processes; and

WHEREAS the United States Congress, National Association of Local Boards of Health, and the Washington Climate Advisory Team specifically recommend Complete Street policies as a strategy to increase pedestrian and bicycle travel modes and to reduce the negative impacts associated with climate change; and

WHEREAS other jurisdictions and agencies nationwide have adopted Complete Streets legislation including the United States Department of Transportation, numerous state transportation agencies, and cities including San Francisco, Sacramento, San Diego, Boulder, Chicago, Seattle, Kirkland, Redmond and Portland; and

WHEREAS a 2007 Washington State Department of Transportation survey found that a lack of pedestrian and bicycle infrastructure, such as sidewalks and bicycle lanes, is a primary reason why Washington residents do not walk or bicycle more frequently; and

WHEREAS many of the existing roadways where Pierce County residents walk and bicycle are incomplete and unsafe. These streets lack sidewalks or crosswalks, have lanes too narrow to share with bicyclists, and make no accommodation for transit riders or for people with disabilities; and

WHEREAS recent trends indicate that Pierce County will experience increased traffic congestion and travel times as the population increases and the number of commuters to employment centers within the County increases; and

WHEREAS there are practical limits to the expansion of roadways in order to satisfy travel demands, and promoting pedestrian, bicycle and transit travel reduce negative environmental impacts, promote healthy living and are less costly to the commuter; and

WHEREAS decisions about transportation systems may contribute to:

1. Physical inactivity and obesity:

- Each additional hour spent driving is associated with a 6% increase in the likelihood of obesity, while each additional kilometer walked is associated with a 5% reduction in this likelihood.
- Transit users and people with safe places to walk within 10 minutes of their homes are more likely to meet the Surgeon General's recommendations for minimum daily exercise.
- The Task Force on Community Preventive Services strongly recommends creating or improving access to places such as sidewalks and trails and improving street lighting, installing traffic calming measures (e.g., speed humps, traffic circles), improving safety of street crossings, and enhancing street landscaping as effective strategies to increase physical activity.

2. Unintentional injury:

- Motor vehicle accidents are the leading cause of death among people between the ages of one and twenty-four and increases in the number of vehicle miles traveled and vehicle hours traveled increase the risk of injury or death;
- Roadways designed predominately for automobiles with multiple lanes, high speeds, lack of pedestrian and bicycle infrastructure, long distances between intersections or crosswalks, and many large commercial establishments, pose an increased risk of injury or death for pedestrians and cyclists

3. Decreased air quality:

- Transportation contributes 45% of all green house gas emissions in Washington State;
- Asthma and other respiratory conditions may be triggered or exacerbated by poor air quality;

4. Decreased water quality:

- Runoff of oil and gasoline pollutes waterways, and is exacerbated when the amount of impervious surface, such as roadways and large parking lots, is increased.

5. Social inequities:

- Almost one-third of Americans do not drive. Streets that do not accommodate alternative transportation options disproportionately impact vulnerable populations such as children, low-income, elderly, and disabled residents, resulting in reduced access to jobs and needed services.

THEREFORE BE IT RESOLVED that the Tacoma-Pierce County Board of Health in order to ensure the promotion of the health of our communities, urges decision makers in all Pierce County municipalities to adopt and implement Complete Streets policies and practices that:

- Specify that 'all users' includes pedestrians, bicyclists, transit vehicles and users, and motorists, of all ages and abilities;
- Create a comprehensive, integrated, connected transportation network;
- Address all roads within its jurisdiction;
- Apply policies to both new and retrofit projects, including planning, design, maintenance, and operation, for the entire right of way;
- Make any exceptions for the exclusion of pedestrian and bicycle facilities specific, set a clear procedure that requires high-level approval of exceptions, and provide documented supporting data that indicates the basis for the decision;
- Direct the use of the latest and best design standards;
- Recognize the need for flexibility and direct that Complete Streets solutions fit in with context of the community; and
- Establish performance standards with measurable outcomes.

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