

2040 Centers Transportation Strategies & Mode Split Targets Project Final Report

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The 2040 Centers Transportation Strategies and Mode Split Target Project has been developed in conjunction with the Transportation System Plan for the City of Portland, Oregon.

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Chapter 1 Introduction

The City of Portland Office of Transportation (PDOT) is currently developing a Transportation System Plan (TSP) to guide the City's investment in pedestrian, bicycle, transit and street improvements over the next 20 years. The TSP must be consistent with the Regional Transportation Plan, which emphasizes a strong link between transportation and land-use, and must comply with the Clean Air Act by reducing air pollution and the Americans with Disabilities Act to provide a transportation system that is accessible for all users. It is also required by the State Transportation Planning Rule (TPR) to reduce vehicle miles traveled and the number of parking spaces per person over a 20-year planning period. An important aspect of this plan is therefore the coordination of transportation investments with land-use and growth management policies in ways that link transportation service to growing areas and provide people with more choices in how they travel. To measure progress towards these goals, the TPR specifies that the TSP use mode split as a measurable objective and set benchmarks that measure progress toward these goals at five-year intervals.

Project Description

The 2040 Centers Transportation Strategies and Mode Split Targets project aids the TSP by:

- ◆ Developing a set of quantitative descriptors measuring land use and transportation characteristics associated with increased use of alternative modes;
- ◆ Setting non-single occupancy vehicle mode split targets¹ for selected 2040 town centers and station communities;
- ◆ Identifying strategies for reducing reliance on single occupancy vehicles in Portland's town centers and station communities by promoting walking, bicycling, transit use, and carpooling.

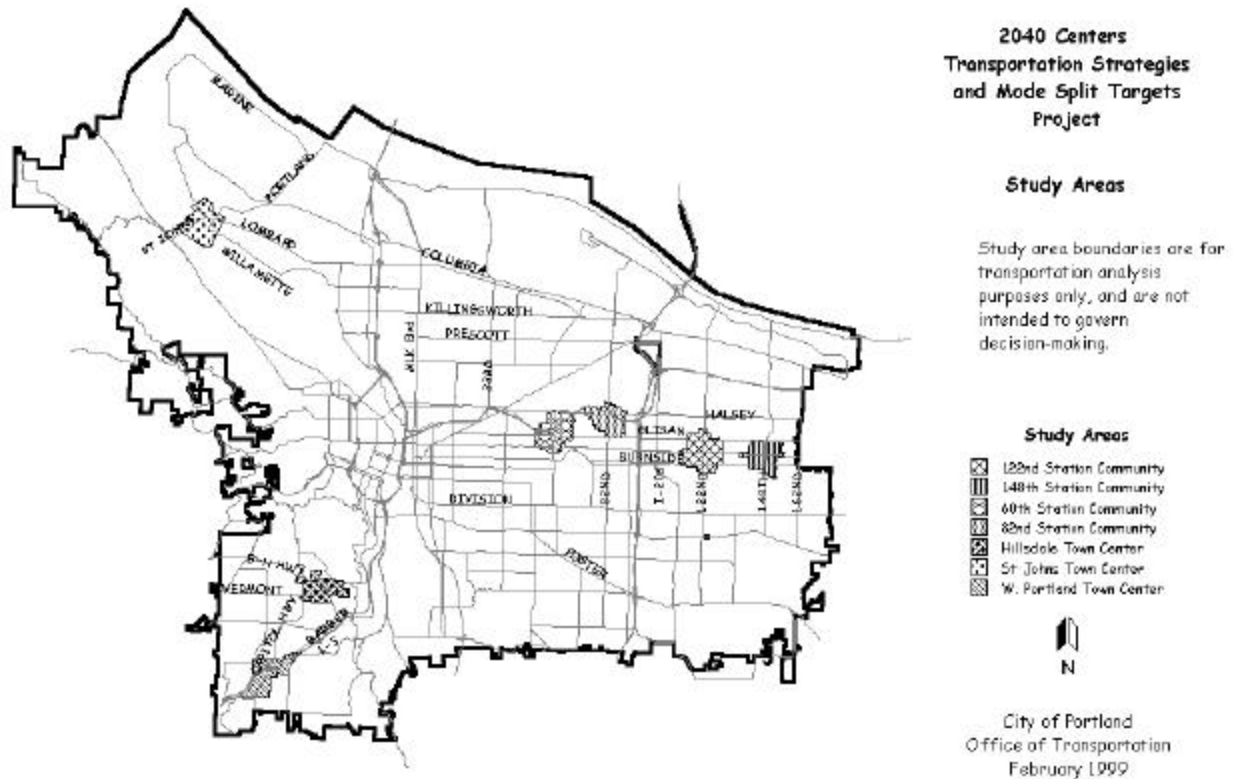
There are seven areas of study included in the project. Three areas are designated town centers including Hillsdale, St. Johns, and West Portland Town Centers. Four are designated as light rail station communities including 60th, 82nd, 122nd, and 148th Station Areas. Figure 1-1 identifies each study area's locale in the City of Portland.

The project serves as a first step toward implementing the town center and station area concepts in these areas. The objective for this project is to develop a methodology for measuring compliance with Urban Growth Management Functional Plan mode split targets. To accomplish this, the project consists of four components:

¹ Non-single occupancy vehicle mode splits combine market share for shared auto, transit, walk, and bicycle person trips for all purposes.

- ◆ Analyzing travel forecast data;
- ◆ Developing descriptors;
- ◆ Profiling study areas;
- ◆ Identifying strategies to improve non-single occupancy vehicle mode splits.

Figure 1-1: Location of Study Areas



Policy Context

The TSP and the Centers project are guided by an elaborate policy context, composed of existing and emerging policy guidelines at the federal, state and regional levels as well as the City's own planning documents. These guidelines mandate the development of measurable indicators of regional policy goals, with several specific references to 2040 Centers. The characteristics of centers are also key elements,

implicitly and explicitly, of the community plans that comprise the City of Portland's Comprehensive Plan.

At the broadest level, the federal Transportation Equity Act for the Twenty-first Century (TEA-21) of 1998 recognizes the importance of planning for and encouraging the use of alternative transportation modes. TEA-21 requires the consideration of alternative transportation modes in the development of state and regional transportation plans and directs that projects benefiting alternative modes be more favorably considered for funding than projects primarily targeting single occupancy vehicles. The Act also dedicates an average of \$620 million per year to transportation enhancement projects, which include improvements to bicycle and pedestrian infrastructure as well as safety and educational activities for pedestrians and bicyclists, and an average of \$30 million annually for transit enhancement projects.

At the state level, Oregon's Transportation Planning Rule (TPR), adopted by the Land Conservation and Development Commission (LCDC) in 1991 to implement the statewide land-use planning goal for transportation, mandates that the City of Portland and Metro each adopt a Transportation System Plan (TSP). Portland is developing its TSP within the regional TSP and is required to include in the plan a set of indicators that define its planning goals, to monitor progress toward them at five-year intervals, and to adjust its plan if it should fall short of the benchmark targets. The TPR specifically targets regional reduction of automobile use per capita by 15% over a 30-year planning period. It also mandates that Portland adopt regulations to reduce reliance on the automobile, including a 10 percent reduction in the number of parking spaces per capita in the metropolitan area over a 20-year period.

Metro's regional policies specifically describe Centers and the diverse, distinct roles that each plays within the regional system. They also include planning requirements and recommendations regarding the future development of these Centers. The Regional Urban Growth Goals and Objectives report (RUGGO) contains Metro's most extensive discussion of the 2040 Centers and articulates regional policies regarding the characteristics of growth in and around Portland. Development of the Regional Framework Plan, component functional plans, and functional plan amendments must be consistent with the RUGGO.

A critical piece of the RUGGO report is the Region 2040 Growth Concept, which describes a framework for maintaining regional livability in the face of significant growth. The Concept's growth policies emphasize maintaining a compact urban region, and include a planning framework that envisions absorbing anticipated growth of 500,000 to 750,000 over the next twenty years. The underlying strategy of the Growth Concept is to achieve compact growth through intense development in a hierarchy of urban centers and simultaneously improving transportation access in ways that promote alternative modes and reduce per capita automobile use.

The collective role of the 2040 Centers is to 'provide efficient access to goods and services, enhance multi-modal transportation and create vital, attractive neighborhoods and communities' (RUGGO, p. 26). Separately, however, the centers serve significantly different functions and can be distinguished generally by their scale, structure, and the extent to which they concentrate and mix housing, jobs and other attractions.

The centers range from Regional centers, which provide employment and attractions in a high-density setting, exceptionally accessible to hundreds of thousands, to Corridors, which serve local needs with frequent bus service and inviting pedestrian environments. The Centers project focuses specifically on two 2040 design types: town centers and station communities.

The 2040 Growth Concept envisions town centers function as business and civic hubs offering a full-range of services to community residents and employees. They feature high-quality transit connections to regional centers and other major destinations; and they are highly accessible by walking and bicycling.

Station Communities, according to the 2040 Growth Concept, function as higher density residential neighborhoods centered around light rail transit stops. Some locally serving commercial and employment opportunities are provided. They feature a high-quality pedestrian and bicycle environment.

It is essential that the roles and uses of different centers must be taken into account in developing a broadly applicable set of descriptors that link their land-use, accessibility, and travel demand characteristics to the travel behaviors and choices of those who use them.

Metro's Urban Growth Management Functional Plan (UGMFP) implements the Region 2040 Growth Concept by establishing a set of regional requirements for cities and counties. The Plan summarizes the characteristics for each type of urban center and mandates that mode split be used as 'the key regional measure for transportation effectiveness in all 2040 Growth Concept land use design types' (Title 6, Section 4.A). The Plan also mandates local jurisdictions to establish alternative mode split targets for all land use design types that meet or exceed targets set by Metro and mandates the identification of actions to implement the targets. Table 1-1 lists the Functional Plan targets by design type.

Table 1-1: Regional Non-Single Occupancy Vehicle Mode Split Targets

2040 Design Type	Non-SOV Mode Split Target
Central City	60% to 70%
Regional Centers, Town Centers, Main Streets, Station Communities, and Corridors	45% to 55%
Industrial Areas and Intermodal Facilities, Employment Areas, and Inner and Outer Neighborhoods	40% to 45%

At the local level, Portland's Comprehensive Plan guides future growth and development. In an effort to comply with the requirements of the Functional Plan, Portland is amending portions of its Comprehensive Plan. The development of a Transportation System Plan is part of this effort to comply and will be adopted into the Transportation Element of the Comprehensive Plan.

The City of Portland is now concentrating on increasing jobs and housing opportunities for its citizens through “place-making”. Over the next several years, planning efforts will concentrate on improving Town Centers, Main Streets, and Corridors. Critical to these efforts will be improvements to the transportation system that increase mobility for all modes of transportation.

Chapter 2 Project Methodology

Introduction

As discussed in Chapter One, the project includes an analysis of travel forecast data, inventory and evaluation of each center, and development of descriptors that serve as the basis for TSP benchmarks. A consistent methodology for each task is critical for comparison across study areas and for conducting the five-year evaluation of each area mandated by the Functional Plan. This chapter discusses the methodologies developed and applied to the project for each of the above tasks.

Defining Study Areas

The study area boundaries for the Centers project were developed in conjunction with the City of Portland's Comprehensive Plan Update Project (CPUP). The CPUP is charged with ensuring that Portland's comprehensive plan complies with Metro's UGM Functional Plan.

Title 1, section 3 of the UGM Functional Plan requires cities and counties to amend their comprehensive plans to include boundaries for each 2040 design type within their jurisdiction. A technical team, which included Centers project staff, formed to develop a methodology for defining boundaries. The team developed a number of methods for setting boundaries in order to reflect the various levels of planning that have been undertaken in each area.

St. Johns Town Center

This center is not part of a community plan or current planning effort. The boundary was developed using the 2040 Concept Map as a starting point. From there, refinements were made based on knowledge of the area and the Comprehensive Plan Map and policies. Additional adjustments were made based on the following criteria:

- ◆ Existing zoning
- ◆ 10 and 20 minute walk isochrons
- ◆ Rights-of-way
- ◆ Block and lot patterns
- ◆ Presence of an environmental constraint
- ◆ Physical barriers such as a freeway or a topographic feature
- ◆ Infrastructure availability and capacity

Hillsdale and West Portland Town Centers

These two centers are currently undergoing a community planning process, the Southwest Community Plan. In this case, the team developed a “working” boundary, guiding technical work, but can be modified as the planning progresses.

122nd and 148th Light Rail Station Areas

These light rail station areas underwent a community planning process in the mid-1990’s, the Outer Southeast Community Plan (OSCP). The boundaries were delineated using the 2040 Growth Concept Map with adjustments based on future land use patterns incorporated into the OSCP.

60th and 82nd Light Rail Station Areas

These two stations have not undergone a recent planning effort. The boundaries were developed using the 2040 Growth Plan Map with refinements based on the following criteria:

- ◆ Existing zoning
- ◆ 10 and 20 minute walk isochrons
- ◆ Rights-of-way
- ◆ Block and lot patterns
- ◆ Presence of an environmental constraint
- ◆ Physical barriers such as a freeway or a topographic feature
- ◆ Infrastructure availability and capacity

The boundaries developed for this project were used for analysis purposes only. They are not intended to govern legislative decisions such as zoning.

Travel Analysis

This section describes the steps leading to the development of baseline mode split data for each town center and light rail station community included in the project.

Developing an Aggregated Zone System

The Portland Metro region is divided into 1,260 transportation analysis zones (TAZ). These zones serve as the basic geographic unit for transportation modeling in the region. For the purpose of this project, the 1,260-zone geography was too fine-grained. In order to derive person trips and mode splits for each center, it was necessary to combine the TAZs to approximate the boundaries of each center.

Metro’s staff completed a preliminary correlation of 2040 design types to each TAZ for the purposes of modeling variables such as parking costs, transit subsidies, and attractiveness of walking and bicycling in the Round 1 Regional Transportation Plan (RTP) modeling process. Building on Metro’s work, the 1,260 TAZs were grouped by their 2040 design type designation– regional center, town center, and light rail station community – then combined to roughly approximate the geographic boundaries of each center. The TAZs that correspond to the Central City geography were combined to approximate the Central City Plan sub-

districts. The TAZs not categorized as a regional center, town center, or station area community were aggregated more broadly into geographic sub-regions. Figure 2-1 illustrates the 105-zone system.

Figure 2-1: 105-zone Travel Zone System

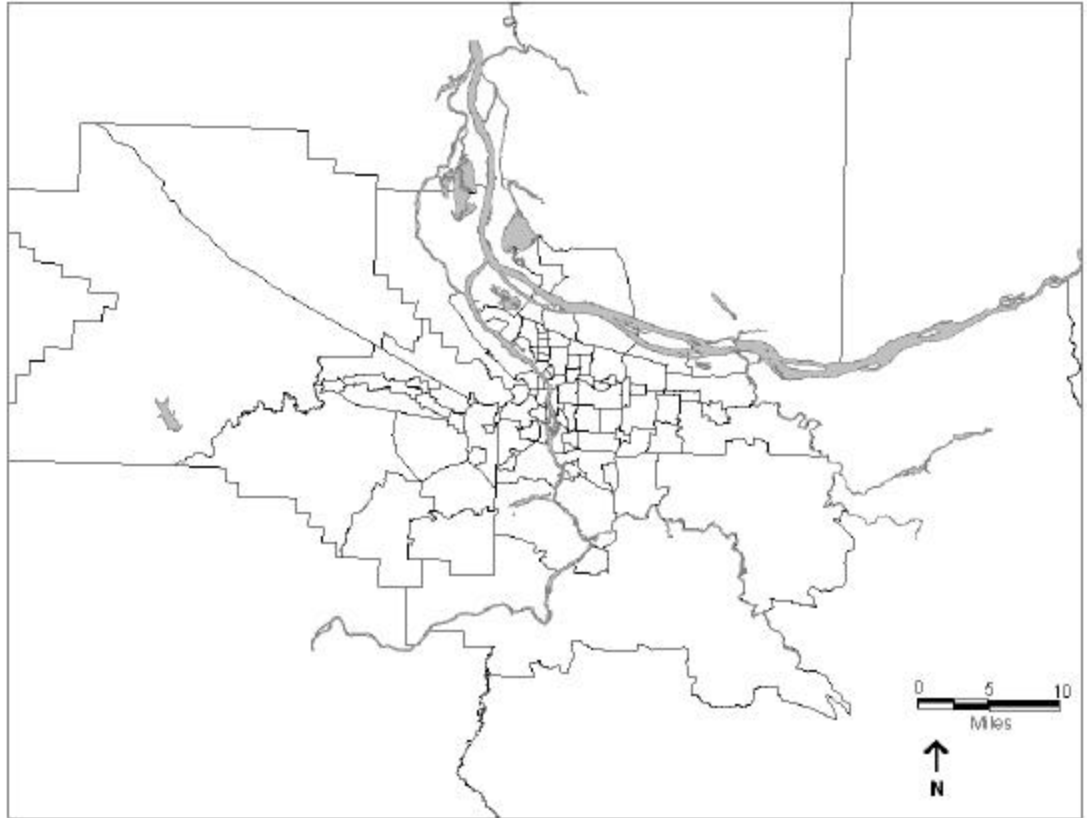


Table 2-1 lists each center included in the project, the center zone, and its Metro TAZ equivalency.

Table 2-1: Centers Zone Equivalency

Center	Center Zone	Metro TAZ Equivalency
60 th Station Area	58	719, 770
82 nd Station Area	66	721, 771
122 nd Station Area	62	744, 745, 746, 747
148 th Station Area	44	760
Hillsdale Town Center	37	51, 56, 945
St. Johns Town Center	98	925, 926
West Portland Town Center	53	65, 68, 69

Working with Metro's Travel Demand Model

The next step involved obtaining Metro's travel forecast data. Metro completed the first round of modeling for the RTP in June 1998. The model base year is 1994 and the future year is 2020. In the first round Metro staff modeled a Preferred land use-transportation scenario, a Strategic Auto scenario, and a Strategic Transit scenario. The data output from the Preferred scenario was selected for use in this project. The Preferred scenario was selected on the basis that it represented the most optimistic investment strategy and would produce the highest achievable mode splits. Table 2-2 includes the guiding principles behind the Preferred Scenario assumptions. Table 2-3 details the 2040 land use assumptions used in the Preferred Scenario by center.

Aggregating the travel forecast data into the 105 zone system created sub-task 1, Metro produced origin-destination tables for the following purposes, all weekday and two-hour p.m. peak:

- ◆ Home-based Work
- ◆ Home-based Non-work
- ◆ Non-home-based Work
- ◆ Non-home-based Non-work
- ◆ College
- ◆ School

Appendix A includes detailed worksheets for each center that include person trips and mode split calculations by trip purpose and transportation mode for 1994 and 2020.

Table 2-2: Principles for System Development – Preferred Scenario

Vision	Modal Mix	Elements	Finance	Performance
Implements all Primary Growth Components	All modal needs are met.	Central City and Regional Centers served by light rail, direct access to regional highway system, arterial capacity improvements, and major pedestrian/bicycle system improvements.	Includes all currently identified revenue.	Meets all Chapter 1 modal targets.
Preserves the Functional Plan's "Regional Highway Function"		Industrial Areas have strong connections to regional highway system and inter-modal facilities.	Identifies specific new federal, state, and regional revenue sources.	Meets all RTP performance measures.
Addresses most Secondary Growth Concept Components		Town Centers, Corridors, and Main Streets are served by primary transit, improved arterial streets, and significant improvements to the pedestrian and bicycle system.	Assumes unspecified new revenue sources.	Meets State TPR requirements.
Addresses many needs for other Growth Concept Components		Neighborhoods and Employment Areas are served by secondary transit, improved arterial streets, and have some improvements to the pedestrian and bicycle system.	Assumes some new local revenue sources.	
Meets all 20-year benchmarks for Growth Concept implementation				

Table 2-3: Transportation Analysis Zone Assumptions for the Preferred Scenario

Center	2040 Characteristic	2020 Intersection Density	2020 Parking Factors	2020 Transit Pass Factor	2020 Modal Targets
Tier 1 Town Center St Johns	Moderate housing and employment density planned with high level access by all modes. Currently has good mix of uses, well-connected street system and good transit.	>16	1.60	75%	55%
Tier 2 Town Center Hillsdale West Portland	Moderate housing and employment density planned with high level access by all modes. Currently have some mix of uses, moderately connected street system and some transit. Existing topography or physical barriers may limit pedestrian and bike travel.	>12	.72	90%	50%
Tier 1 Station Areas 60th 82nd 122nd 148th	High Density housing density mixed with commercial services; highest level of access for transit, bike and walk trips; existing LRT.	>16	1.60	70%	55%

Calculating Non-Single Occupancy Vehicle Mode Split

The Functional Plan defines alternative mode split “as non-Single Occupancy Vehicle (SOV) person trips as a percentage of all person trips for all modes of transportation”. The non-SOV mode split is the aggregation of mode split for shared vehicle, transit, bicycle, walk, and school bus trips.

The mode split is calculated by combining the non-SOV mode person trips for the six trip purposes to achieve a total number of non-SOV person trips and dividing the sum by the grand total number of person trips (which includes single-occupancy vehicle trips).

An additional calculation is necessary to disaggregate drive alone person trips from shared ride person trips. Metro develop the following equation to derive shared ride trips from total vehicle trips:

$$\text{Shared Ride Person Trips} = \text{Totp}(1/\text{OCC}-1)/-.55$$

Where TOTp = the total auto person trips for a trip purpose, and

OCC = the overall auto occupancy for a trip purpose.

Table 2-4 shows the overall auto occupancy figures for each trip purpose.

Table 2-4: 1994 and 2020 Auto Occupancy Rates

Trip Purpose	1994 Auto Occupancy Rate	2020 Auto Occupancy Rate
Homebased Work	2.2	2.2
Homebased Other	1.245	1.219
Non-Homebased Work	1.020	1.020
Non-Homebased Non-Work	1.265	1.238
College	1.069	1.046
School	1.700	1.700

The results of the travel forecast data analysis are included with each study area profile.

Data Collection

The data collected for each center is used to develop a current profile of land use and transportation characteristics. Descriptor values that will serve as a baseline that can be reassessed over time to measure change. The existing conditions data also guides the development of implementation strategies.

Multnomah County Tax Assessor records serves as the foundation of the each center's land use inventory database. The tax assessor records, current to October 1998, were augmented with original data collection. A sample of the field inventory sheet used to collect the additional field data is found in Appendix B. The types of data collected include detailed land use activity information, number of parking spaces for commercial uses, building orientation, and availability of sidewalks.

The land use activity coding system developed for this project is also found in Appendix B. The classifications are derived from land use categories described in Portland's Zoning Code (Title 33 of the Comprehensive Plan). The coding system identifies broad categories of uses, then sub-divides each use by specialized activities. The land use inventory was conducted between October 1998 and February 1999.

In addition to the existing land use inventory, data describing transportation and socio-economic factors were also collected. Table 2-5 lists the type of data collected and source used in identifying the existing conditions.

Table 2-5: List of Data and Sources

Data Collected	Source
Aerial Photos	City of Portland, 1996
Demographic Data	American Community Survey, 1996
ECO Rule Employers	Department of Environmental Quality, 1998
Employment Data	Oregon Department of Employment, Metro, 1996
Portland Bicycle Network	City of Portland, Office of Transportation, 1999
Street Centerline	City of Portland, Office of Transportation, 1999
Traffic Volumes	City of Portland, Office of Transportation, 1996
Tri-Met Transit Routes and Service	Tri-Met, 1998
Title 33 Zoning	City of Portland, Bureau of Planning, 1999

Descriptors

A key objective of the Centers project is the development of quantitative land use and transportation descriptors that measure characteristics that predict a higher level of transit use, walking and bicycling in a given area. The descriptors enable us to track progress towards or away from improving the environment for walking, biking and transit, in order to achieve mode split targets over time. Portland's TSP will use the descriptors as a basis for the development of mandated benchmarks. For the purposes of the Centers project, the descriptors will be used to create a baseline assessment of each center and to evaluate opportunities and constraints to achieving mode split targets.

Significant effort went into the research and development of the descriptors. Appendix C, Descriptors Background Report, details the research findings used to select the descriptors. In addition to conducting a literature review, staff interviewed other planning professionals, and conducted a work session with the TSP technical advisory committee. The outcome of this effort was the selection of descriptors most predictive of the choice to walk, bike or use transit. Table 2-6 provides the finalized list the land use and transportation descriptors.

The ability to duplicate the baseline assessment is essential for re-evaluation. Following is a detailed discussion of the methodology used to calculate the descriptors by type.

Density

The calculation of residential and employment density relies on the standard units per acre. Net acreage, where streets are subtracted from the gross acreage for each center, serves as the denominator. The number of detached and attached residential units for each area is ascertained from the land use inventory database. The number of employees in each center is derived from the 1996 Oregon Employment Department "Covered Employment" database using GIS software.

Diversity

Originally, a different set of descriptors was selected to capture diversity. These are described in the Descriptors Background Report found in Appendix B. However, criteria for developing measurement tools assert that measures are easy to understand and easy to duplicate. The preliminary descriptors in this category did not meet the criteria. Instead, a simple listing of the key activities and their relative size is used.

The list of key uses includes the types of basic land use activities appropriate to a diverse, mixed-use community. For each center, the aggregate number of uses in each activity category is calculated using the land use inventory database and Metro's RLIS database. Uses included in the key commercial activities category are listed in Table 2-7. Key commercial activities are defined as uses that offer shopping, entertainment, or services for local area residents. Their presence in a mixed-use center may attract more walking, biking, or transit trips.

The percentage of land use area is calculated by querying the land use inventory database for the number of occurrences of an activity then calculating the total parcel square footage for that activity. The activity square footage is divided by the total center square footage.

Table 2-6: Land Use and Transportation Descriptors

Category	Descriptor	Purpose
<i>Density</i>	◆ Detached Dwelling Units/Acre	Measures the intensity of development
	◆ Attached Dwelling Units/Acre	
	◆ Total Dwelling Units/Acre	
	◆ Employees/Net Acre	
<i>Diversity</i>	Number of Uses and Percentage of Center Land Area for:	Measures the mix of uses in an area.
	◆ Residential	
	◆ Key Commercial	
	◆ Schools	
	◆ Community Center/Library	
	◆ Parks	
<i>Design</i>	◆ Intersections/mile	Measure urban form characteristics.
	◆ Percentage of street segments with sidewalks	
	◆ Percentage of designated bicycle facilities constructed.	
	◆ Design Evaluation of Commercial Structures	
<i>Transit Service</i>	◆ Number of transit lines serving area	Measures quality of transit service.
	◆ Peak hour headways by line	
	◆ Mid-day headways by line	
	◆ Number of service hours by line	
<i>Transportation Demand Management</i>	◆ Number of employers subject to ECO Rule requirements	Measures potential for commute option programs in area.
<i>Parking</i>	◆ Average cost of parking per hour	Measures cost and availability of parking.
	◆ Average number of off-street parking spaces per 1000sf commercial use	
<i>Demographics</i>	◆ Median Income	Measure the key socio-economic patterns in each area.
	◆ Household Size	
	◆ Number of Household Workers	
	◆ Vehicle Ownership	

Table 2-7: Key Commercial Establishments by Category

Food	Pharmacy	Eating Establishments	Personal Services	Retail Goods	Professional Services
Bakery	Pharmacy	Coffee House	Animal Grooming	Art/Art Supplies	Medical/ Dental Offices
Mini-mart	Drug Store	Fast Food	Barber/Salon	Book Store	Veterinarian
Specialty Grocery		Restaurant	Branch Bank	Clothing/ Shoes	
Supermarket		Tavern	Dance Studio/ Martial Arts	Copies/ Blueprints	
			Daycare	Fabric/Crafts	
			Health Club	Florist	
			Laundromat/ Dry Cleaner	Game Arcade	
			Post Office	General Merchandise	
			Tailor	Home Furnishings	
			Tanning Salon	Home Improvement	
				Jewelry	
				Locksmith	
				Music	
				Pets	
				Photo	
				Sporting Goods	
				Stationary	
				Theatre	
				Toy/Novelty Store	
				Videos	

Intersection Density

The calculation for intersection density is the number of intersections per linear mile by center. The total linear miles are calculated using the Bureau of Traffic Management's street centerline file. The number of intersections in each center is identified using GIS.

Pedestrian Network

The calculation for this descriptor is the number of street segments with complete sidewalks divided by the total number of street segments. The total number of street segments for a given center is calculated from the BTM street centerline file. The total number of street segments with sidewalks along both sides of the street is identified using a combination of the land use inventory database, aerial photos, and cadastral maps.

Bicycle Network

The percentage of designated bike facilities built to date is calculated using the BTM Bicycle Network database. The total linear miles of designated bicycle facilities, including bike boulevards, bike lanes, recreational trails, and signed connections are calculated. Next, the total linear miles of built bicycle facilities are calculated. The built facilities are divided by the designated facilities.

Design Evaluation of Commercial Structures

Using the land use inventory database, the number of commercial properties is identified. Each of the land use databases include an evaluation of each commercial structure using the following criteria:

1. Building setback less than 25' from the pedestrian/transit street.
2. There is no vehicle parking between the building and the pedestrian/transit street.
3. The building's main entrance is oriented to the pedestrian/transit street.

The greater the number of criteria a building meets, the more pedestrian- and transit-friendly the design.

Database queries identified the number of commercial properties that meet all three of the criteria, then two of the criteria, then one, and finally none. The number of buildings at each level is divided by the total number of commercial structures in a center.

Transit Service

Tri Met's transit service data is obtained from their web site. The data gathering is straightforward. Each route and the associated headways are identified. Service hours are calculated by calculating the number of hours between the first and last bus or train to the area.

Transportation Demand Management

The purpose of the transportation demand management (TDM) analysis was to locate businesses with TDM programs within each of the Centers. Collecting a complete database of employers that use transportation demand management strategies to reduce SOV trips within each center proved too difficult. Instead, the Project obtained a database of employers subject to Employee Commute Options requirements from the Oregon Department of Environmental Quality (DEQ). The Employee Commute Options (ECO-rule) program mandates that employers with over 50 at a single work site provide incentives for carpooling, transit,

walking, or bicycling to their employees. The commute options developed must have the potential to reduce SOV commuting to the site by 10% within three years. The number of ECO Rule employers is an indicator of formal TDM programs in the centers, which can increase the use of alternative modes.

The methodology consisted of two steps. First, addresses and names of TDM businesses were identified through an ECO Rule database. Second, the employer site addresses were geocoded and matched to the site addresses in the Multnomah County Tax Assessor records. The result was a new, map-able ECO Rule database consisting only of businesses within the Centers' boundaries.

Commercial Parking Methodology

Two descriptors are used to assess parking conditions. The first measures cost. Currently, all centers have free on and off-street parking, so the cost is zero. In the future, some centers may institute on-street meters or paid lots to regulate parking supply. The second measure is the number of spaces per 1000sf of commercial space.

The commercial parking supply was calculated by using GIS to identify parcels as commercial, retail, or recreational from the land use database. Total commercial building square footage, based on Multnomah County Tax Assessor data, was calculated. Using the parking inventory in the land use database, the sum of off-street parking spaces for the commercial parcels was calculated. The total parking spaces were divided by total commercial building square footage to obtain parking per 1000 square feet of commercial usage.

Demographics

The population and household descriptions for each Center were based on 1996 American Community Survey block group data. All block groups that overlap with the Center were included in the analysis. The reported values therefore represent all households and populations within these block groups, not just those within the boundary of the Center.

Economic Analysis

An economic development allocation analysis was performed for each study area. Appendix D includes the methodology and results by center. The results were incorporated into the evaluation of each study area.

Case Studies

Appendix E contains the existing conditions data collected for each of the seven study areas included in the project. Each case study includes:

- ◆ A study area profile that depicts current conditions for land use, transportation, and demographic elements.
- ◆ Baseline values for each of the land use and transportation descriptors.
- ◆ An analysis of current travel behavior based on Metro's 1994 Travel Forecasting Model.

Chapter 3 Assessing the Centers

Introduction

The assessment of each center identifies attributes that positively and negatively impact walking, biking, and transit mode split. It is important to emphasize that the correlation between travel behavior and built environment attributes, such as density, has been made through academic research. However, the link between a change in a single attribute such as transit service or sidewalk construction and a change in mode split has not been made. While Metro's travel demand forecast model provides a basic understanding of travel behavior in these centers, it has limitations to its predictive ability. The model relies on surrogate assumptions to model transit, pedestrian, bike, parking, and urban form attributes. Current models are not sensitive to the finer grain attributes such as bike lanes, sidewalks, or supportive building design, observed in neighborhoods with higher levels of transit use, walking, and bicycling.

The criteria used in the assessment of each center derive from the same background research used to develop the descriptors. Essentially, the assessment is an illustrative analysis of the descriptor values and provides the basis for identifying improvements that will help each center achieve the desired non-SOV mode split. When possible, current conditions will be evaluated against the 2020 RTP Preferred Model assumptions to identify improvements. However, as previously stated the model has limitations. Many of the descriptors developed to track change are not currently modeled.

For each center, this chapter:

- ◆ Summarizes the descriptor values.
- ◆ Assesses mode split target compliance.
- ◆ Identifies opportunities and constraints to increasing non-SOV mode split.

Hillsdale Town Center

Summary of Descriptor Values

Table 3-1 provides a summary of the baseline descriptor values for the Hillsdale Town Center.

Mode Split Target Compliance

The UGM Functional Plan mode split target for this area is 45%. Metro's travel forecast model estimates the 1994 non-SOV mode split for the Hillsdale travel zone at 41%. Of this, transit, walk, and bike trips make up 10% of the share. The remainder comes from shared vehicle trips of two or more passengers. The model forecasts the 2020 non-SOV mode split to be 41%, no increase from 1994. However, the market share for transit, walk and bike trips increases to 17%, while shared vehicle trips decline. The Hillsdale Town Center comes within a few percentage points of meeting the target in both the current and future year.

Opportunities and Constraints

Density and Diversity

The Hillsdale Town Center possesses many of the characteristics necessary for a healthy, vibrant town center. It has a core commercial area surrounded by residential uses. The majority of acreage (56%) in the town center is used for residential, particularly townhomes and apartments. Single-family units make up only 18% of the total units in the town center and tend to be situated on larger lots, reducing the overall residential density.

Unique to this center is the number of institutional uses located in close proximity. These include three public schools, two private schools, two parks, a public library, a fire station, and a community center. The institutions draw patrons and employees into the center from a broader area.

The commercial core of Hillsdale is located along SW Capitol Hwy between SW 21st and SW Cheltenham and on SW Sunset between SW Capitol Hwy and SW Dewitt. A second commercial node is located at the intersection of SW Capitol Hwy and SW 30th. The commercial district is a collection of auto-oriented, single-story strip developments. Well-established, the district includes a diverse mix of neighborhood serving retail uses in close proximity to the residential and institutional uses. An analysis of the geographic distribution of trips into Hillsdale confirms that the town center draws a majority of person trips from within and from travel zones immediately adjacent to the center.

Updated zoning was adopted in November 1997. The mix of zoning and comprehensive plan designations allows a variety of housing densities, from 6.2 units per acre on R7 property up to 65 units per acre on R1 zoned property. The majority of commercially zoned property is in General Commercial (CG) with a design overlay (d). The design overlay ensures that as the area redevelops, buildings will be pedestrian- and transit-friendly while accommodating the automobile. There are pockets of Neighborhood Commercial (CN2), Storefront Commercial (CS), Office Commercial (CO1), and Commercial/Residential (CM) located along SW Capitol Hwy and SW Vermont. These zones are subject to standards supportive of transit, pedestrians, and bikes.

Tables 3-2 and 3-3 summarize the findings from the redevelopment analysis completed for this center. The analysis shows a potential 17% increase in housing units and a 155% increase in employment. The employment increase is driven by a large potential buildout of retail square footage. The marginal increase in housing units is tied to the potential buildout densities of the available vacant and redevelopable sites.

Table 3-2: Hillsdale Town Center 2020 Housing Assessment

Vacant & Redevelopable Land (in acres)		Added Housing Units in 2020			Average New Unit Density
Resid'l	Other	SF Units	MF Units	Total Units	Units/Acre
13.7	9.2	21	211	232	18.8

Table 3-3: Hillsdale Town Center 2020 Employment Assessment

Added Commercial/Industrial Building Square Footage				Added Jobs		2020 Potential Employment
Retail	Office	Industrial	Total	Retail	Other	Employee/Net Acre
921,500	0	0	921,500	1,843	0	12.3

Streetscape

Table 3-4 compares the current intersection density in the Hillsdale Town Center with the 2020 RTP Preferred assumption. The deficiency in street connectivity is due to cul-de-sac developments, large institutional uses that limit through access, and unconstructed rights-of-way.

Table 3-4: Hillsdale Town Center Intersection Density

	Intersections Per Mile	Average Length Between Intersections
1999 – Hillsdale Town Center	7.5	704'
2020 RTP Preferred Tier II Town Center Assumption	12	440'

Pedestrian circulation in Hillsdale is negatively affected by the lack of through street connections. Indirect travel lengthens trip distances and can discourage people from walking to local activities. Hillsdale Town Center also scores poorly in the provision of sidewalks. Most local streets do not have sidewalks. Streets designated as City Walkways, with the exception of SW Vermont, do not have continuous sidewalks. These conditions to a lesser extent apply to the Hillsdale Pedestrian District. To encourage walking as a mode of travel, pedestrian infrastructure needs to be in place. This is particularly critical for the pedestrian to transit linkages along high frequency bus routes along Beaverton-Hillsdale Hwy.

The deficiency in pedestrian facilities is being addressed on SW Capitol Hwy. The Capitol Hwy Plan will improve the pedestrian environment along SW Capitol Hwy between Hillsdale and Multnomah Village. The first phase of the plan is underway. Recently, wider sidewalks and street trees were added along SW Capitol Hwy between SW Cheltenham and SW 18th. A signalized pedestrian crossing is now located between SW Sunset and SW Bertha, in the heart of the commercial district. This crossing will facilitate pedestrian movement across busy SW Capitol Hwy.

The planned network of bicycle routes, when complete, will provide improve links between Hillsdale and the surrounding areas. Currently, only 46% of the linear miles of planned bike facilities have been developed.

Transit Service

Currently, seven transit lines serve the area with varying degrees of service quality. The 2020 RTP Preferred model assumes a revised pattern of service. Table 3-3 compares current service with the modeled future service.

An analysis of travel data indicates that the majority of trips leaving from Hillsdale are destined for Central City locations, particularly Downtown. Both the current and modeled transit networks meet this travel niche. Trips coming into the center primarily draw from greater SW Portland, 15% from the travel zone just west of Hillsdale.

The proposed 2020 network will need to be reviewed to ensure that quality local service into Hillsdale is maintained. The 2020 modeled network improves local transit connectivity from areas north by extending the #55 into Hillsdale and increasing frequency of service. Route 5 is also modeled with a slight increase in service frequency. Overall, the transit mode split increases from 5% in 1994 to 9% in 2020.

Parking and Transportation Demand Management

The commercial parking ratio is high (5.6 spaces/1000sf) in comparison to other centers. This means that an ample amount of off-street parking is available in the center's commercial areas. It is important to note that on-street parking is prohibited along SW Capitol Hwy in the core commercial area. The CGd zoning in this area was, in part, recognition of on-street parking restrictions. Still the average minimum required parking for the types of commercial uses found in Hillsdale is approximately 2.8 spaces/1000sf. The compactness of the core commercial area provides an opportunity to create shared parking arrangements, particularly as the area's aging commercial properties are redeveloped.

The 2020 RTP Preferred model assumes that a parking charge will be in place. This factor is a surrogate for restrictions on supply. Currently, on- and off-street parking is free in this area and as shown above, there is an ample supply of parking. Controlling parking supply through restrictions and fees is an accepted transportation management strategy used in the Central City and may be an appropriate long term strategy for Hillsdale as the area redevelops.

A more immediate opportunity is to focus developing transportation demand management programs for larger employers in the area. Currently, three employers in the area are subject to the ECO-rule requirements. Hillsdale, with its numerous institutions, may be an appropriate location for a transportation management association (TMA), similar to the Lloyd District TMA.

Table 3-5: Comparison of 1999 and 2020 RTP Preferred Transit Network

Route	Description	1994 Peak Headways (minutes)	2020 Peak Headways (minutes)	1994 Off-Peak Headways (minutes)	2020 Off-Peak Headways (minutes)
1 Vermont	Not Modeled	15	N/A	30	N/A
5 Capitol Hwy	Primary Bus	10	6	15	12
45 Garden Home	Not Modeled	30	N/A	60	N/A
54 Beaverton Hillsdale	Becomes Regional Frequent Bus	30	4	30	8
55 Hamilton	Secondary Bus Extends to Burlingame TC through Hillsdale	30	10	No Service	30
61X Marquam/ Beaverton	Secondary Bus	30	10	No Service	30
64X Marquam/ Tigard	Secondary Bus	30	10	No Service	60
47 Vermont/ Olsen	New Line Connects Washington SQ to Lewis & Clark College through Hillsdale	N/A	10	N/A	15
503 SW to Lloyd District	New Line Connects SW Portland to Lloyd District via Capitol Hwy	N/A	10	N/A	60

Summary of Descriptor Values

Table 3-6 summarizes the baseline descriptor values for St. Johns Town Center.

Mode Split Target Compliance

An analysis of the travel forecast data shows that in 1994 the non-SOV mode split for St. Johns was 42%. Within the non-SOV category, transit, bikes, and pedestrians, together, capture 14% of the market share. The remaining 28% mode split is contributed by shared vehicle trips. In 2020, the forecasted mode split declines to 40%. The overall decline is attributed to a reduction in the shared auto mode split to 24%. Market share for transit, walk, and bike trips increases to 16% but is not enough to overcome the decline in shared trips.

Opportunities and Constraints

Density and Diversity

St. Johns long history as a commercial center for the North Portland peninsula has influenced its development over the decades. The storefront commercial district of old is still intact along N. Lombard. Almost 50% of its housing stock was constructed prior to the period of post-WWII suburbanization.

The area functions as a commercial and civic hub for the North Portland peninsula. An analysis of travel patterns in the center show that the town center draws a substantial percentage of trips both internally and from travels zones immediately adjacent to the center.

Tables 3-7 and 3-8 summarize the findings from the redevelopment analysis completed for this center. Based on potential buildout of current comprehensive plan designations, housing supply increases by 14% and employment by 480%. The relatively small increase in housing units, particularly when compared with the dramatic increase in employment, reflects the limited amount of vacant and redevelopable property zoned for housing and the large amount of property zoned for retail-commercial and industrial.

Table 3-7: St. Johns Town Center 2020 Housing Assessment

Vacant & Redevelopable Land (in acres)		Added Housing Units in 2020			Average New Unit Density
Resid'l	Other	SF Units	MF Units	Total Units	Units/Acre
9.0	49.1	1	174	175	21.6

Table 3-8: St. Johns Town Center 2020 Employment Assessment

Added Commercial/Industrial Building Square Footage				Added Jobs		
Retail	Office	Industrial	Total	Retail	Other	Total
646,100	0	4,407,500	5,053,600	1,292	5,876	5,894

Bureau of Planning recently began a project to look at improvements in St. Johns Town Center and the N. Lombard Mainstreet. The project will implement town center and main street concepts and result in Comprehensive Plan and zoning code amendments as well as action strategies for the area.

Streetscape

Table 3-9 compares the current intersection density in the St. Johns Town Center with the 2020 RTP Preferred assumption. St. Johns was a thriving center prior to the rise in auto-oriented development in the post WWII era. As of result, the street pattern developed at a scale conducive to good accessibility. There is some opportunity to further increase connectivity by constructing streets in rights-of-way not currently improved. The majority of these undeveloped rights-of-way are located in the residential blocks near the Willamette River.

Table 3-9: St. Johns Town Center Intersection Density

	Intersections Per Mile	Average Length Between Intersections
1999 – St. Johns Town Center	9.2	574'
2020 RTP Preferred Tier I Town Center Assumption	16	330'

The basic pedestrian network in St. Johns is in place. Some streets have gaps in sidewalk continuity or have not been improved, but in the core commercial district sidewalks are in place. The next step for this center is to implement the pedestrian district standards put forth in the Pedestrian Master Plan. Particular attention needs to focus on improving pedestrian crossings of high traffic streets such as N Ivanhoe, N. Lombard, and N St. Louis.

The proposed bicycle network, when complete, will provide good connections between the town center, North Portland, and the Central City. To date, only the multi-use trail over the

St. Johns Bridge is in place. The continued extension of the bicycle network will help to increase bicycle market share in this area.

Transit Service

Table 3-10 compares the existing transit network serving the area with the 2020 modeled network. Six transit lines currently serve St. Johns Town Center. The 2020 modeled network revises this service decreasing the number of lines to four but increasing the service frequencies significantly. The model shows that with the new lines and increased frequencies, overall transit mode split increases from 4% in 1994 to 5% in 2020.

Table 3-10: Comparison of 1999 and 2020 RTP Preferred Transit Network

Route	Description	1994 Peak Headways (minutes)	2020 Peak Headways (minutes)	1994 Off-Peak Headways (minutes)	2020 Off-Peak Headways (minutes)
4 Fessenden	Replaced in 2020 by line 74	12	N/A	15	N/A
6 MLK/ Lombard	Regional Frequent Bus	10	3	15	8
16 Front Ave/St Johns	Replaced in 2020 by #17 reroute	30	N/A	No Service	N/A
17 NW 21st/ St. Helens Rd	Primary Bus service extended to Riverplace	30	6	60	15
40 Mocks Crest	Replaced in 2020	30	N/A	30	N/A
74 Fessenden/ Lloyd/ Milwaukie	New Line Primary Bus St Johns to Rose Quarter TC	N/A	8	N/A	12
75 39 th /Mocks Crest	Primary Bus	15	6	15	10

Transit service does not extend to the industrial employers located along the Willamette River. The transit street classifications do not identify transit service into these employment areas. The potential for substantial increase in the employment in this area may provide an opportunity to increase non-SOV mode split by extending transit service to serve this area.

An analysis of the travel data indicates that a high percentage of trips coming to and from the area are highly localized. This presents an opportunity to capture market share for transit by improving upon local service.

Parking and Transportation Demand Management

The ratio of off-street parking spaces to commercial square footage is comparatively low at 2.8/1000sf. The low ratio is attributed to the development of the commercial core during the streetcar era. More recent commercial sites have developed with large surface parking lots.

On-street parking is available on most streets. N. Lombard, the “main street” allows on-street parking along both sides of the street.

The 2020 model assumes a parking cost factor of .90 for St. Johns. Currently, parking is not priced. As the center grows, a center-wide transportation management association, which includes local industrial employers, could provide guidance on shared parking, parking restrictions, or fees to accommodate increased activities without the addition of more parking.

West Portland Town Center

Summary of Descriptor Values

A summary of the baseline descriptor values is provided in Table 3-11.

Mode Split Target Compliance

The 1994 non-SOV mode split for the West Portland Town Center travel zone is 38%. Of this, transit, walking, and biking account for 9% of the mode split. The remainder is credited to shared auto trips. The 2020 mode split forecast shows a slight decline to 37%. The decline is attributed to the reduction in shared vehicle mode split. The market share for transit, walk and bike actually increases to 16%. Non-SOV mode split should increase by 8% to achieve the UGM Functional Plan target of 45%.

Opportunities and Constraints

Density and Diversity

West Portland Town Center is a relatively young urban center. It is a highly auto-oriented area, supporting low density residential and commercial uses. The majority of housing was constructed in the past thirty years.

Portland’s Bureau of Planning intends to request that Metro amend the 2040 Growth Concept to remove the town center designation from this area. To date, the designation remains.

This area was the subject of a previous Transportation Growth Management grant completed in 1997. The purpose of this study was to identify alternative town center scenarios. Two alternatives were developed. Alternative A envisions a linear town center, building on the existing commercial character of SW Barbur and the node at its intersection with SW Capitol Hwy. Alternative B suggests a bi-nodal town center, focusing on a major commercial node at the intersection of SW Barbur and SW Capitol, and smaller node on SW Capitol at SW Alfred. Both alternatives are recommended for further study as part of the inactive Southwest Community Plan.

Tables 3-12 and 3-13 summarize the findings from the redevelopment analysis completed for this center. Based on current vacant/redevelopable sites and their comprehensive plan designations, housing units could potentially increase by 30% and employment by 56% in a 2020 buildout scenario.

Table 3-12: West Portland Town Center 2020 Housing Assessment

Vacant & Redevelopable Land (in acres)		Added Housing Units in 2020			Average New Unit Density
Resid'l	Other	SF Units	MF Units	Total Units	Units/Acre
27.5	7.2	65	326	391	15.8

Table 3-13: West Portland Town Center 2020 Employment Assessment

Added Commercial/Industrial Building Square Footage				Added Jobs		
Retail	Office	Industrial	Total	Retail	Other	Total
802,700	28,700	0	831,400	1,605	115	1,720

Streetscape

Table 3-14 compares the intersection density in West Portland Town Center with the desired intersection density for its design type. The substandard intersection density is a result of low density suburb design, the presence of two regional transportation facilities, I-5 and SW Barbur, that act as barriers to connectivity, and environmental constraints.

Table 3-14: West Portland Town Center Intersection Density

	Intersections Per Mile	Average Length Between Intersections
1999 – West Portland Town Center	6.6	802'
2020 RTP Preferred Tier II Town Center Assumption	12	440'

The pedestrian environment is deficient in basic pedestrian infrastructure. Only 6% of street segments have complete sidewalks. Pedestrian circulation in the center is limited by the

lack of crossing opportunities over I-5 and the high volume arterials, SW Barbur and SW Capitol Hwy. The lack of pedestrian facilities and the constraints on circulation between activities are barriers to improving non-SOV mode split.

The proposed bicycle network will provide good connections between the town center and surrounding southwest locations. When complete, approximately 50% of the planned linear mile of lanes in the center have been constructed through the SW Capitol Hwy bike lane project. ODOT will be constructing bike lanes along SW Barbur through the center in the near term. The completion of the SW Barbur lanes will provide a direct bicycle route to Downtown Portland.

Transit Service

Table 3-15 compares the existing transit service with the 2020 modeled lines serving West Portland. The modeled network increases the frequency of service on existing lines. Two new lines provide service between the Barbur Transit Center/Sunset Transit Center and the Barbur Transit Center/Lloyd District. Overall, transit mode split increased from 4% to 9% based on this network.

Table 3-15: Comparison of 1999 and 2020 RTP Preferred Transit Network

Route	Description	1994 Peak Headways (minutes)	2020 Peak Headways (minutes)	1994 Off-Peak Headways (minutes)	2020 Off-Peak Headways (minutes)
5 Capitol Hwy	Primary Bus	10	6	15	12
12 Barbur	Regional Rapid Bus	10	4	15	8
43 Taylors Ferry	Secondary Bus	30	10	60	20
64X Marquam/ Tigard	Secondary Bus	30	10	No Service	60
307 Barbur TC/Sunset TC	New Line Connects Barbur TC to Sunset TC limited service	N/A	10	N/A	30
503 SW to Lloyd District	New Line Connects SW Portland to Lloyd District via Capitol Hwy	N/A	10	N/A	60

The SW Barbur regional transit corridor provides a major opportunity to increase mode split in this center. Also, the presence of the Barbur Transit Center and its large surface park and ride lot present an opportunity to combine a major transit hub for the center with a mixed use center.

Parking and Transportation Demand Management

On average, commercial sites provide 3.5 off-street parking spaces per 1000sf. This figure falls into the mid-range for the off-street parking supply. On-street parking is restricted along SW Barbur and SW Capitol Hwy, increasing the demand for off-street surface parking to serve the auto-oriented uses on the commercial strips.

The concentration of employment in the West Portland Town Center, particularly along SW Barbur, presents an opportunity to implement an area wide transportation demand management plan, that could include carpools, transit passes, shared parking between uses. Currently, two area employers are required to comply with the ECO-rule requirements.

60th Station Community

Summary of Descriptor Values

A summary of the baseline descriptor values is provided in Table 3-16.

Mode Split Target Compliance

An analysis of the 1994 travel forecast data finds that the 1994 non-SOV mode split for the 60th Station Area is 42%. Of this market share, transit, bike, and pedestrian trips account for 14%. The remaining 28% come from shared vehicle trips. The estimated mode split increases to 44%, slightly lower than the Functional Plan target of 45%. In 2020, the market share for transit, walk, and bike trips is expected to increase to 22%. However, shared vehicle trips decline to 22% due to a reduction in overall vehicle occupancy.

Opportunities and Constraints

Density and Diversity

The 60th Station Community encompasses a variety of land uses. The majority of the area is comprised of older, stable residential neighborhoods. Commercial activities are found in nodes at major intersections as opposed to long linear strips. A significant industrial employment base occurs on sites north of I-84.

Tables 3-17 and 3-18 summarize the findings from the redevelopment analysis completed for this station community. The number of housing units could increase by 5% and employment by as much as 18% based on current comprehensive plan designations and available sites. The Centers Common project, a transit-oriented development currently under construction, will bring an additional 318 units not included in the redevelopment analysis.

Table 3-17: 60th Station Community 2020 Housing Assessment

Vacant & Redevelopable Land (in acres)		Added Housing Units in 2020			Average New Unit Density
Resid'l	Other	SF Units	MF Units	Total Units	Units/Acre
5.8	2.4	22	82	104	20.0

Table 3-18: 60th Station Community 2020 Employment Assessment

Added Commercial/Industrial Building Square Footage				Added Jobs		
Retail	Office	Industrial	Total	Retail	Other	Total
112,800	0	106,800	219,600	226	142	368

60th Station Community underwent rezoning in the early 1980's to add zoning designations that are supportive to the light rail investment. The industrial area north of I-84 was left as an employment zone. This area presents an opportunity, over time, to transition toward development more compatible with the desired higher density residential and neighborhood-serving commercial uses.

Streetscape

Table 3-19 compares the current intersection density with the desired density. I-84 bisects the station community into distinct north and south halves, the common link being the MAX station and NE 60th. However, each sub-area has good street connectivity. There is some opportunity to increase intersection density closer to the desired density. For example, the Center Commons project will add a new street connection through its superblock site. The large industrial zoned areas, should they redevelop over time, can also add to the overall street connectivity in the area.

Table 3-19: 60th Station Community Intersection Density

	Intersections Per Mile	Average Length Between Intersections
1999 – 60 th Station Community	10.6	502'
2020 RTP Preferred Tier I Station Community Assumption	16	440'

The 60th station community has the most complete pedestrian network (84%) of all the centers included in the study. The next steps should be to bring streets designated as City Walkways up to the standards put forth in the Pedestrian Master Plan.

The proposed bicycle network provides east-west routes through the center. The lack of a north/south bicycle connection to the 60th light rail station creates a gap in the planned network. Currently, none of the proposed lanes have been built.

Transit Service

As table 3-20 shows, the 2020 modeled network maintains the routes currently serving the area, but increases the frequency of service. The modeled network shows a 12% overall transit mode split, up from 6% in 1994.

The geographic distribution of trips leaving 60th Station Community show that a large percentage of trips are destined for the Central City, particularly Downtown. This travel pattern is well served by this transit network.

The majority of trips coming to the station area originate in adjacent travel zones to the east, north, and south. Again, the transit network is compatible with this pattern of travel.

Table 3-20: Comparison of 1999 and 2020 RTP Preferred Transit Network

Route	Description	1994 Peak Headways (minutes)	2020 Peak Headways (minutes)	1994 Off-Peak Headways (minutes)	2020 Off-Peak Headways (minutes)
MAX Hillsboro/ Gresham	Light Rail	7.5	6	10	8
19 Glisan/ Woodstock	Primary Bus	15	6	15	12
20 Burnside	Primary Bus	15	6	15	12
71 60 th /122nd	Primary Bus	15	8	15	12
77 Broadway/ Lovejoy	Primary Bus	15	8	15	12

Parking and Transportation Demand Management

The commercial off-street parking supply is not excessive in this area as evidenced by the relatively low off-street parking ratio of 2.6/1000sf.

Generally, on-street parking is available in the commercial districts, reducing the need for off-street parking and providing a sidewalk buffer along heavily traveled roadways.

The concentration of employment in the 60th Station Community presents an opportunity to implement an area wide transportation demand management plan, that could include carpools, transit passes, shared parking between uses. Currently, three area employers are required to comply with the ECO-rule requirements.

82nd Station Community

Summary of Descriptor Values

A summary of the baseline descriptor values is provided in Table 3-21.

Mode Split Target Compliance

The 1994 non-SOV mode split for the 82nd Station Community is 41%. Transit, walk, and bike trips make up 11% of this total and shared auto trips the remaining 30%. In 2020, the forecasted mode split increases to 42%, just under the UGM Functional Plan target of 45%. Transit, walk, and bike trips grow to 19% of the non-SOV mode split. However, shared auto trips decline to 23%.

Opportunities and Constraints

Density and Diversity

The 82nd Station Community is similar in form to the 60th Station Community. The station community is largely single family residential. NE 82nd serves as the commercial strip for the center. A limited amount of industrial activity occurs along NE Halsey.

Tables 3-22 and 3-23 summarize the findings from the redevelopment analysis completed for this station community. Potential housing growth is limited by the availability of sites, and only grows 6% over current levels. The potential for employment growth is greater based on a buildout of available sites. Employment could increase by as much as 102% in 2020, primarily in the retail sector.

Table 3-22: 82nd Station Community 2020 Housing Assessment

Vacant & Redevelopable Land (in acres)		Added Housing Units in 2020			Average New Unit Density
Resid'l	Other	SF Units	MF Units	Total Units	Units/Acre
3.8	6.5	10	59	69	20.2

Table 3-23: 82nd Station Community 2020 Employment Assessment

Added Commercial/Industrial Building Square Footage				Added Jobs		
Retail	Office	Industrial	Total	Retail	Other	Total
558,000	136,900	21,100	716,000	1,116	119	1235

Like the 60th Station Community, 82nd the zoning and comprehensive plan designations were amended in 1983 to encourage transit-supportive development in the area. As the redevelopment analysis shows, there is an opportunity to redevelop underutilized commercial properties to a density and design that is more conducive to the desired form in the station community.

Streetscape

Again, the I-84 freeway bisects the station community, creating two distinct halves that relate to each other via NE 82nd. Table 3-24 compares the current intersection density with the desired density. The street connectivity in this area is quite good, particularly west of NE 82nd. The location of expansive institutions, Montavilla Community Center/Park and Multnomah Bible College, reduce the overall intersection density.

Table 3-24: 82nd Station Community Intersection Density

	Intersections Per Mile	Average Length Between Intersections
1999 – 82nd Station Community	8.3	636'
2020 RTP Preferred Tier I Station Community Assumption	16	440'

The majority of street segments in the station community are improved with sidewalks along both sides of the street. The City Walkways all have some level of sidewalk provided. Gaps in the pedestrian network primarily occur on the Local Service Streets, particularly those north of I-84. Future improvements should focus on upgrading City Walkways to Pedestrian Master Plan standards and improving intersection crossings.

The proposed bicycle network provides east-west routes through the center. The lack of a north/south bicycle connection to the 82nd light rail station creates a gap in the network, impeding the bicycle to transit connection. Currently, none of the proposed lanes have been built. As the bicycle network is completed, bicycle mode split should increase.

Transit Service

Table 3-25 compares the existing transit network to modeled network. As with the 60th Station Community, the 2020 model assumed the same network but increased service frequencies. Transit mode split in 2020 increases to 9%, up from 5%.

The transit service provided is compatible with the travel patterns observed from the travel forecast data. A significant percentage of trips to and from the area have trip ends in travel zones that are served directly by MAX or the bus routes.

Table 3-25: Comparison of 1999 and 2020 RTP Preferred Transit Network

Route	Description	1994 Peak Headways (minutes)	2020 Peak Headways (minutes)	1994 Off-Peak Headways (minutes)	2020 Off-Peak Headways (minutes)
MAX Hillsboro/ Gresham	Light Rail	7.5	6	10	8
19 Glisan/ Woodstock	Primary Bus	15	6	15	12
72 82 nd / Killingsworth	Primary Bus	15	6	15	10
77 Broadway/ Lovejoy	Primary Bus	15	8	15	12

Parking and Transportation Demand Management

The off-street commercial parking ratio is relatively low at 2.3/1000sf. The character of commercial structures in the station community, although generally auto-oriented in character, is small-scale strip development. There are no 'big box' structures in the area.

NE 82nd carries large volumes of vehicle traffic. To improve flow, on-street parking is restricted. The prevailing commercial zoning along NE 82nd is Storefront Commercial. The desired character of the commercial district conflicts with the desired traffic function.

Three employers in the area are subject to the ECO-rule requirements. Non-SOV mode split may increase as employer trip reduction plans are implemented and fewer single-occupancy vehicle trips result.

122nd Station Community**Summary of Descriptor Values**

A summary of the baseline descriptor values is provided in Table 3-26.

Mode Split Target Compliance

The 1994 non-SOV mode split for the 122nd Station Community is 40%. Transit, bicycle, and walk trips account for 7% of the share and shared auto trips, the remaining 33%. In 2020, the estimated non-SOV mode split declines slightly to 39%, due to a decline in the shared ride mode split. However transit, walk, and bike mode split increases to 15%.

Opportunities and Constraints

Density and Diversity

The 122nd Station Community is the most “commercial” of the station areas included in the study. Commercial uses are located along NE/SE 122nd, NE Glisan, and SE Stark. The area has several large strip malls and auto dealerships. Housing accounts for only 47% of the net acreage.

Tables 3-27 and 3-28 summarize the findings from the redevelopment analysis completed for this station community. The analysis shows potential for housing units to increase by 38% over current numbers. Employment also has the potential to increase substantially, driven by opportunities for both retail and, to a lesser extent, office growth.

Table 3-27: 122nd Station Community 2020 Housing Assessment

Vacant & Redevelopable Land (in acres)		Added Housing Units in 2020			Average New Unit Density
Resid'l	Other	SF Units	MF Units	Total Units	Units/Acre
28.1	13.4	15	525	540	21.4

Table 3-28: 122nd Station Community 2020 Employment Assessment

Added Commercial/Industrial Building Square Footage				Added Jobs		
Retail	Office	Industrial	Total	Retail	Other	Total
1,167,900	164,200	0	1,332,100	2,336	657	2,993

The 122nd Station Community was rezoned in 1996 as part of the Outer Southeast Community Plan process. The updated zoning reflects a desired by the community to increase residential densities and convert auto-oriented commercial to transit- and pedestrian-supportive commercial development. The relatively high growth potential in both housing and commercial demonstrates that the area has the potential to function more fully as a dense, mixed used transit-oriented neighborhood.

Streetscape

The street pattern and level of connectivity in the 122nd Station Community reflects the area’s development during the post-WWII suburbanization. Curvilinear and dead-end streets create superblocks that reduce accessibility for pedestrians. As the area redevelops, opportunities to establish links with existing streets and improve connectivity will arise.

Table 3-29: 122nd Station Community Intersection Density

	Intersections Per Mile	Average Length Between Intersections
1999 – 122 nd Station Community	7.6	695'
2020 RTP Preferred Tier I Station Community Assumption	16	440'

The pedestrian environment is subject to deficiencies beyond this lack of connectivity. The pedestrian network is incomplete, particularly on Local Service Streets. Not all City Walkways have continuous sidewalks. The lack of maturity in the network provides an opportunity to construct facilities to the standards put forth in the Pedestrian Master Plan.

The Ventura Park Pedestrian District, also incomplete, encompasses a relatively small area surrounding the MAX station. Compatible zoning (as defined in the Pedestrian Master Plan) occurs more broadly than the current pedestrian district boundaries. Regional and City policy would support an expansion of the pedestrian district.

The proposed bicycle network provides both east/west and north/south connections through the station area. The E Burnside lanes are in place, as are the lanes on NE/SE 122nd north of NE Glisan and south of SE Stark. To date the section of NE/SE 122nd between NE Glisan and SE Stark has not been built. Adding this piece will complete a critical connection to the MAX station, where long-term bicycle parking is provided.

Transit Service

Table 3-30 compares the current transit network serving the station community with the 2020 modeled network. The modeled network reflects an increase in service frequency over the existing service levels with no new lines added. Transit mode split increased to 8% from 3% in 1994.

A comparison of the existing network with travel patterns observed in the model shows that trips originating in the 122nd Station Community travel zone are destined primarily for travel zones that are served by light rail, such as Downtown, Gateway, and Lloyd District and to travel zones north and south that have transit connections.

For trips coming to 122nd Station Community, a large percentage draw from the travel zones immediately north and south of the station area, suggesting a strong draw to the commercial activities and to the regional light rail service. Increased service frequency on line 71 supports into this travel pattern.

Table 3-30: Comparison of 1999 and 2020 RTP Preferred Transit Network

Route	Description	1994 Peak Headways (minutes)	2020 Peak Headways (minutes)	1994 Off-Peak Headways (minutes)	2020 Off-Peak Headways (minutes)
MAX Hillsboro/ Gresham	Light Rail	7.5	6	10	8
25 Outer Glisan	Secondary Bus	60	10	60	30
26 Stark	Primary Bus	30	6	30	15
71 52nd/60 th	Primary Bus	15	8	15	12

Parking and Transportation Demand Management

Ample off-street parking is provided for the area's commercial activities. The commercial parking ratio of 4.4 spaces/1000sf does not include off-street parking for auto sales lots along NE/SE 122nd.

Most of the area's commercial zoning is now in Storefront Commercial (CS), which does not require off-street parking. As the commercial areas redevelop under this zoning designation, the off-street parking ratio should decrease. However, on-street parking is restricted along many of the streets serving commercial properties, potentially reducing the benefit of the Storefront Commercial zoning.

148th Station Community

Summary of Descriptor Values

A summary of the baseline descriptor values is provided in Table 3-31.

Mode Split Target Compliance

An analysis of the travel data shows that in 1994 the non-single occupancy vehicle mode split for 148th Station Community was 43%. Of this transit, bicycle and pedestrians, capture 9% of the market share. Shared Auto makes up the remainder of the mode share. In 2020, the estimated modes split increases to 48%. The Functional Plan target for Station Communities is 45%. Based on the 2020 model output, 148th Station Community exceeds compliance by 3%. The increase is due to a large jump transit, walk, and bike market share, up to 26%.

Opportunities and Constraints

Density and Diversity

Like the 122nd Station Community, the 148th Station Community experienced the majority of its development during a 30-year period after WWII. Its character is primarily low-density single family residential evidenced by the amount of acreage given to this land use. Attached housing, including apartments and townhomes, are concentrated primarily along the major arterials of NE/SE 148th, E. Burnside, and SE Stark. The amount of neighborhood-serving commercial is limited and located along SE Stark, west of 148th, which serves as the area's commercial district. The commercial structures reflect an auto-oriented design, setback from the street, with vehicle parking located between the street and the building.

Tables 3-32 and 3-33 summarize the findings from the redevelopment analysis completed for this station community. The station area shows a tremendous growth potential in housing units and in jobs. In a potential buildout scenario, housing supply increases by 137% and employment increases by 600%. The employment increase appears dramatic because the current employment is low.

Table 3-32: 148th Station Community 2020 Housing Assessment

Vacant & Redevelopable Land (in acres)		Added Housing Units in 2020			Average New Unit Density
Resid'l	Other	SF Units	MF Units	Total Units	Units/Acre
76.5	14.4	96	1,348	1,444	21.0

Table 3-23: 148th Station Community 2020 Employment Assessment

Added Commercial/Industrial Building Square Footage				Added Jobs		
Retail	Office	Industrial	Total	Retail	Other	Total
1,034,800	136,100	0	1,170,900	2,070	544	2,614

The station area was rezoned in 1996, through the Outer Southeast Community Plan. The intent of the rezoning was to encourage development of dense commercial and residential uses over time. Under the revised zoning pattern, SE Stark continues to function as the commercial district for the station community with the Storefront Commercial, Mixed Commercial-Residential, and Office Commercial fostering development that is compatible with the desired character of the area.

The rezoning of residential areas is intended to create a dense pocket of multi-family housing adjacent to the station. The intensity of allowable development steps down further away from the transit station.

The potential for growth in housing and employment is reflected in current changes. This is an area in transition. A number of higher density housing and commercial structures have been built recently. Two new commercial structures – a restaurant and an office building – are under construction, the design supportive of a pedestrian- and transit-friendly streetscape. Several new attached housing developments are also completed or under

construction. Additionally, several single-family properties along SE Stark are for sale and advertising the properties' zoning status.

Streetscape

Table 3-34 compares the current intersection density with the 2020 modeled density. A widely spaced grid that creates large blocks characterizes the current street pattern in the 148th Station Community. North-south streets are, on average, spaced at 473 feet intervals. Only three east-west streets, NE Glisan, E Burnside, and SE Stark, connect through the station area with an average spacing of 883 feet. In several places, stubbed streets mark the beginning effort to create through-street connections. As redevelopment takes place in this area, there is opportunity to improve east-west street connections.

Table 3-34: 148th Station Community Intersection Density

	Intersections Per Mile	Average Length Between Intersections
1999 – 148th Station Community	6.5	812'
2020 RTP Preferred Tier I Station Community Assumption	16	440'

Station communities are intended to have a high level of pedestrian amenities. The current pedestrian environment in the 148th Station Community falls short of the desired character. Although the existing streets in the station area are generally connected, the large-scale grid pattern negatively impacts pedestrian circulation and access in the station area by increasing travel distances between activities.

The station area street network does not meet the Pedestrian Design Guidelines of the Portland's Pedestrian Master Plan. The Local Service streets are generally not improved with sidewalks. Of the streets identified as City Walkways, only E. Burnside and NE/SE 148th are improved with continuous sidewalks in the station area. The width of the sidewalks along these two streets ranges from 6 to 8 feet. NE Glisan has a discontinuous sidewalk. SE Stark, east of SE 148th, also has a discontinuous sidewalk. West of SE 148th, along SE Stark's commercial district, the street is improved with 8' sidewalks. In all cases, the sidewalk width is far below the recommended width of 12' put forth in the Pedestrian Design Guidelines.

Crossing the area's major streets poses varying degrees of difficulty. Although crossing opportunities are restricted on E Burnside due to light rail, controlled pedestrian crossings are spaced on average 660' apart west of NE/SE 148th and, on average, 940' apart east of NE/SE 148th. The Pedestrian Design Guidelines recommended a spacing of no more than 400 feet between connections.

Along NE/SE 148th, traffic signals located at the NE Glisan, E Burnside, and SE Stark intersections aid crossing.

NE Glisan and SE Stark pose the greatest difficulties for pedestrians trying to cross the street. Both are wide arterials carrying relatively high volumes of traffic that inhibit pedestrian movement across streets. Traffic signals are only available at the intersections with NE/SE 148th. No crosswalks or other pedestrian improvements, with the exception of a pedestrian bridge over NE Glisan aiding school children's crossing to Glenfair Elementary School, are provided.

Generally, the pedestrian environment is underdeveloped. Basic pedestrian amenities such as complete sidewalk network, street trees, crosswalks at local intersections, and good street lighting are missing on key streets, particularly along SE Stark, the commercial district for the station area.

The environment for bicycles in this area is improving. Bicycle lanes have been striped along NE/SE 148th and E Burnside. NE Glisan and SE Stark are not yet improved with bicycle lanes but both are identified for future lanes. The transit station does not provide long term bicycle parking opportunities. A survey of the commercial district found that little or no secure bicycle parking is provided. However, a visual inspection of new construction shows that the minimum short-term bicycle parking is provided, as required by code regulations.

Transit Service

All transit routes in the area provide east-west service. Currently, no transit service in the area provides access to and from locations north and south of the station community. An analysis of travel data shows that a relatively large percentage of all person trips move between the travel zones to the north and south. A transit connection along NE/SE 148th that provides access to the light rail station area is warranted.

Table 3-35 compares the existing service with the service modeled for 2020. The 2020 network retains the existing routes and adds a peak hour only line along NE/SE 148th. The result is an increase in the overall transit mode split to 12%. Transit mode split in 1994 was 4%.

Parking and Transportation Demand Management

As with all of the study areas, parking supply is not subject to cost factors. Ample free off-street parking is the norm for this area. The commercial district along SE Stark has large expanses of off-street surface parking. However, on-street parking is prohibited on SE Stark through most of the area. The current zoning encourages the development of new commercial and residential with little or no off-street parking. Market forces dictate that some vehicle parking be available to commercial activities. Additionally, on-street parking acts as a buffer between busy roadways and sidewalks, shielding pedestrians from fast moving traffic and creating a more comfortable environment. The on-street parking restriction on SE Stark is incompatible with the desired character of the business district.

A visual survey of the area indicates that informal park and ride activity is controlled with signed 2 hour parking limits along NE/SE 148th between NE Glisan and SE Stark, as well as the prohibition of on-street parking along E Burnside and SE Stark. NE Glisan does allow on-street parking. Park and ride intrusion into the residential neighborhood is prevented because no local streets intersect NE/SE 148th near the transit station, creating lengthy distances between the non-regulated parking and the station.

Table 3-35: Comparison of 1999 and 2020 RTP Preferred Transit Network

Route	Description	1994 Peak Headways (minutes)	2020 Peak Headways (minutes)	1994 Off-Peak Headways (minutes)	2020 Off-Peak Headways (minutes)
MAX Hillsboro/ Gresham	Light Rail	7.5	6	10	8
25 Outer Glisan	Secondary Bus	60	10	60	30
26 Stark	Primary Bus	30	6	30	15
448 148th	Secondary Bus New Line Peak Hour Only Service	N/A	8	N/A	15

Overview of Assessment Findings

- ◆ Modest increases and declines in the overall non-SOV mode split were observed for all centers. While each center saw an increase in the mode splits for transit, walking, and bicycling, a decline in the shared ride component impacted overall growth. The shared ride mode split declines due to an anticipated reduction in the vehicle occupancy rate in 2020. Demographic changes are expected to impact the rate at which people chose to drive alone versus share vehicle space.
- ◆ Most of the centers have zoning and comprehensive plan designations that are supportive of their desired character. All areas have the potential to increase housing units and employment to varying degrees.
- ◆ The level of deficiency in pedestrian facilities ranged greatly. Communities built out in the past 30 years are experiencing the greatest deficiency in their pedestrian improvements - missing sidewalks and unsafe pedestrian crossings. Areas built out prior to WWII, are more walkable and have basic infrastructure in place. In these areas, the focus should be on upgrading the existing streetscape to meet the pedestrian design standards of the Pedestrian Master Plan.
- ◆ While a complete bike network has been identified for each study area, the majority of the facilities have yet to be constructed. As the Portland Bicycle Network builds out over time, trips taken via bicycle should increase.
- ◆ Across the board, the 2020 modeled transit networks with its increased service frequency and addition of new lines elevated overall transit mode split anywhere from 1% to 6%.

- ◆ New communities had a higher commercial parking ratio than older communities, but in general ample, free surface parking is available. On-street parking restrictions conflict with the transit- and pedestrian-friendly commercial zoning designations in many of the centers.
- ◆ Homebased Other trip purpose, consistently, accounts for the greatest percentage of person trips. Currently, Homebased Other person trips taken by transit, walk, or bicycle capture a small percentage of the overall market share. The centers where a large percentage of streets have continuous sidewalks and good intersection density tend to have a higher walk/bicycle mode split in this category. Improvements in land use diversity and accessibility should improve the walk and bike mode split in this category.
- ◆ Homebased Work and Non-Homebased Non-Work person trips also capture a relatively large percentage of total trips in each area. SOV reduction strategies have traditionally focused on the work trip and as a result transit, walk, and bicycle mode splits are relatively high for Homebased Work Trips. This approach will continue through the use of targeted employee transportation demand management programs. Transit, walk, and bicycle mode split is very low for the Non-Homebased Non-Work person trip. Non-SOV mode splits should increase in this category as the centers realize their desired 2040 character.

Chapter 4 Mode Split Targets and Implementation Strategies

Introduction

The ultimate goal of this project is to promote livable neighborhoods in the City of Portland. The City, its jurisdictional partners, and its citizens deem improvement of transportation choices a desired goal. Mode split targets, strategies for achieving the targets and benchmarks for tracking success over time are means to desired outcome – promoting transportation options in Portland communities.

This chapter recommends a non-SOV mode split for town center and station community design types. It identifies program strategies for achieving the targets over a twenty-year horizon. Lastly, it describes how the products of this study will be incorporated into Portland's Transportation System Plan.

Recommended Mode Split Targets

Table 4-1 lists the current and future non-SOV mode splits by center. All centers are nearing the desired target in 1994; the non-SOV mode split driven primarily by the shared ride component. In 2020, the modeled assumptions for increased transit service, street connectivity, growth in employment and residential units, and parking restrictions garner an increase in transit, walk, and bicycle mode split. However, the decline in the 2020 auto-occupancy rates reduces the overall positive impact of the increase.

The Urban Growth Management Functional Plan specifies non-SOV mode split targets of between 45% and 55% for town centers and station communities. The targets set for a 20-year planning horizon. The City of Portland is in the early stages of implementing the 2040 Growth Concept. Over the next twenty years, the City and its partners will continue to improve transit, pedestrian and bicycle facilities, and make changes in the urban form that are compatible with the desired character of these centers. In time, the combination of these efforts will positively increase the percentage of trips using transit, walking, and biking as the mode of choice.

Table 4-1: Comparison of 1994 and 2020 Center Non-SOV Mode Split

Center	Origin Non-SOV Mode Split		Destination Non-SOV Mode Split		Total Non-SOV Mode Split	
	1994	2020	1994	2020	1994	2020
Hillsdale Town Center	41%	44%	41%	38%	41%	41%
St. Johns Town Center	43%	42%	41%	37%	42%	40%
W. Portland Town Center	40%	38%	35%	35%	38%	37%
60 th Station Community	45%	47%	39%	40%	42%	44%
82 nd Station Community	43%	45%	40%	39%	42%	44%
122 nd Station Community	40%	43%	39%	35%	40%	41%
148 th Station Community	39%	47%	47%	49%	43%	48%

Recommendation

The study recommends that the City adopt a non-SOV mode split target of 45% for town center and station community design types as part of its Transportation System Plan, except where different non-SOV mode split targets have been established through special area studies.

Comments: The 45% target establishes an attainable goal in compliance with the UGM Functional Plan policy. An analysis of the travel forecast model reveals that the majority of centers were within a few percentage points of achieving the 45% overall non-SOV target in 1994. In the 2020 model, substantial growth in transit, walk, and bicycle mode split is observed, although shade auto mode split declines. The land use and transportation assumptions in this model represent an optimistic view of the region's investment land use practices and infrastructure improvements. Equating the travel forecast model analysis with a current assessment of conditions finds each center at various stages on a continuum towards the envisioned characteristics of the town center and station community design. With time and strategic investment in these centers, changes will positively impact the non-SOV mode split.

Implementation Strategies

The travel model analysis shows that trips can be shifted away from automobiles toward bus and light rail, walking, and bicycle through improvements in our communities. This section includes programmatic strategies to guide implementing actions that will help achieve the targets over the 20-year timeframe.

Urban Form

1. Request the Portland Development Commission to prepare a development plan for each center that implements the desired growth in transit- and pedestrian-friendly residential and commercial uses.

Discussion: The redevelopment analysis prepared for the project confirms opportunities for increasing housing and commercial density occur in each center. A development plan would identify opportunity sites and strategies for site development and financing.

2. Request the Planning Bureau to evaluate zoning and comprehensive plan designations for centers not included in the recent Community Plan projects to ensure that land use regulations are compatible with desired character for these areas.

Discussion: St. Johns Town Center, 60th Station Community and 82nd Station Community have not been evaluated in an adopted planning process that incorporates the 2040 growth concept principles. The Bureau of Planning will begin a review of the St. Johns Town Center and Lombard Mainstreet this summer that will result in zoning and comprehensive plan amendments. The 60th Station Community was part of the East Portland Community Plan, which has been suspended. The 82nd Station Community has not been reviewed since the 1983 Transit Station Area Planning Project.

Transit

1. Work with Tri Met to implement service improvements on regional and primary routes to the level identified in the Regional Transportation Plan.

Discussion: The travel forecast model shows an increase in transit mode split with increases in service frequencies on the regional and primary transit routes.

2. Develop a secondary transit network for each center that improves transit accessibility between the center and surrounding community.

Discussion: The secondary network should provide localized service between the town centers and the surrounding neighborhoods that are attracted to their commercial and civic opportunities. The model shows that shopping and recreation trips (Homebased Other) tend to be more localized. Currently, transit mode split in this category is low. Improvements in the secondary transit network could increase transit mode split, particularly for destination trips.

3. Improve transit stops with landing pads, shelters, lighting, and more detailed route information.

Discussion: Creating a comfortable environment at the beginning and end of the transit trip will help to attract and retain transit riders. The City of Portland and Tri Met have formed a partnership to implement the Route Performance Program, designed to improve bus operations, enhance bus rider amenities at key bus stops, prepare routes for low-floor buses, and promote service improvements. At least one of the priority routes serves each center. The program received a \$4.5 million “Preferential Streets” grant under the FTA’s TEA-21 program.

Circulation

1. Develop a master street plan for each center that identifies new street connections and pedestrian and bicycle accessways.

Discussion: A master street plan establishes a system of streets and accessways that can increase accessibility and serve new development. The Portland Office of Transportation will embark on the development of master street plans for Southwest and Far Southeast Portland as part of its TSP, areas which include the town centers in Hillsdale and West Portland, and the station communities at the 122nd and 148th light rail stations.

Pedestrian and Bicycle Facilities

1. Complete the pedestrian network serving each center, in accordance with the Pedestrian Design Guidelines, which emphasizes center identity and makes walking the mode of choice within the center.

Discussion: Improvements should first target Pedestrian Districts and City Walkways and should focus on the completion of the sidewalk network, widening sidewalks where appropriate, improving intersection crossings, and providing street trees.

2. Adopt pedestrian districts in the 60th, 82nd and 148th Station Communities.

Discussion: Portions of these station communities meet the pedestrian district criteria in the Pedestrian Master Plan.

3. Adopt expanded boundaries for the Ventura Park pedestrian district, located in the 122nd Station Community.

Discussion: Compatible zoning extends beyond current district boundaries warranting an expansion.

4. Complete the bicycle network serving each center as defined in the Bicycle Master Plan.

Discussion: Completing the bike network will support growth in bicycle trips.

5. Identify north-south bicycle route connections to the 60th and 82nd Station Communities.

Discussion: The Transportation Element does not designate a Bikeway connection on 60th or 82nd, connecting the light rail station. The Bicycle Master Plan also does not include in its network a bike to transit connection on these routes.

6. Provide long-term, secure bicycle parking at light rail stations and transit centers.

Discussion: Amenities such as bike parking reinforce the bicycle-transit connection.

Parking

1. Apply Standard B, Parking Maximums, from Table 266-2 of Title 33 Planning and Zoning.

Discussion: The Bureau of Planning has completed a study of parking ratios as part of its Functional Plan compliance activities. The recommended parking maximums are substantially compliant with Metro's Functional Plan requirements. The City Council will be considering action in fall 1999.

2. Increase opportunities for on-street parking in commercial districts.

Discussion: On-street parking supports mixed use development and allows intensification of development by reducing the need for on-site parking. In some centers, the desired character of the commercial zone is not compatible with the current parking restrictions.

Transportation Demand Management

1. Evaluate potential for creation of Transportation Management Associations (TMA) in town centers to reduce SOV commute trips.

Link to the Transportation System Plan

The next step for the project is to fold its products into Portland's Transportation System Plan. Following is a discussion of how the products will be incorporated:

- ◆ The Plan's Implementation section identifies benchmarks and mode split targets. The descriptors provide the basis for setting 20-year benchmarks for each center. Further work is needed to develop the 5 year, 10 year, 15 year and 20 year benchmark values. The mode split targets for the town centers and station communities will be incorporated into this section.
- ◆ The Plan's Special Area Studies section identifies the City's 20-year transportation system needs for targeted areas. A description of each center's needs assessment and the strategies for increasing center mode splits will be incorporated into this section.

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→ Completed Projects and Reports → Studies, Plans, and Reports → **Appendix A Travel Demand Forecast Tables**

Mode Split by Activity Hillsdale Town Center (PDF Document, 15kb)

Hillsdale Transit Center (Zone 37)

Mode Split by Activity St. Johns Town Center (PDF Document, 21kb)

St. Johns Town Center (Zone 97)

Mode Split by Activity West Portland Town Center (PDF Document, 22kb)

West Portland Town Center (Zone 53)

Mode Split by Activity 60th Station Community (PDF Document, 21kb)

60th Station Area (Zone 58)

Mode Split by Activity 82nd Station Community (PDF Document, 21kb)

82nd Station Area (Zone 66)

Mode Split by Activity 122nd Station Community (PDF Document, 21kb)

122nd Station Area (Zone 62)

Mode Split by Activity 148th Station Community (PDF Document, 21kb)

148th Station Area (Zone 44)

If you have any questions or comments on our site, please contact our site administrator.

PDF Information

Some of the links on this page are to PDF documents. To open PDF files you will need Adobe Acrobat Reader installed on your computer, it is available for free from Adobe.com.



Appendix B

Land Use Inventory Data Collection Form

LAND USE INFO	R#	R#	R#	R#	R#	R#	R#
MIXED USE?	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐
LAND USE 1							
DESCRIPTION							
LAND USE 2							
DESCRIPTION							
LAND USE 3							
DESCRIPTION							
MULTI FAMILY # OF UNITS							
LAND USE COMMENT?							
SITE CHARACTERISTICS							
SEWVALES	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐
OFF STREET PARKING #SPACES							
BIKE PARKING #SPACES							
BUILDING SETBACK <25FT	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐
PARKING BTW ENTRANCE AND STREET	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐
ENTRANCE ORIENTED TO STREET	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐
NOTES/COMMENTS							
STUDY AREA				BLOCK #			

Land Use Categories and Descriptions

HOU	HOUSING	REC	RECREATIONAL	RET	RETAIL USE
SF	SINGLE FAMILY	REC1	BOWLING ALLEY	RET1	ANIMAL GROOMING
MF	MULTI- FAMILY	REC2	ICE RINK	RET2	APPLIANCE REPAIR
GL	GROUP LIVING	REC3	DRIVING RANGE	RET3	ART/ ART SUPPLIES
		REC4	HEALTH CLUB	RET4	BOOKS/ MAGAZINES
INS	INSTITUTIONAL USE	REC5	GAME ARCADE	RET5	BRANCH BANK
INS1	SCHOOL	REC6	FRING RANGE	RET6	CLOTHINGSHOES
INS2	HOSPITAL	REC7	THEATRE	RET7	COFFEE HOUSE
INS3	COLLEGE/ UNIVERSITY	REC8	STADIUM/ COUSEUM	RET8	COPIES/ BLUEPRINTS
INS4	COMMUNITY CENTER	REC9	RACE TRACK	RET9	DANCE
INS5	YOUTH CLUB	REC10	EXHIBITION/FAIRGROUNDS	RET10	ELECTRONICS
INS6	SOCIAL SERVICE			RET11	FABRIC/ CRAFTS
INS7	RELIGIOUS INSTITUTION	VEC	VEHICLE SERVICES	RET12	FAST FOOD
INS8	BASIC UTILITIES	VEC1	FUEL	RET13	GENERAL MERCHANDISE
INS9	CHILDCARE	VEC2	FUEL/ CARWASH	RET14	HAIR
INS10	POLICE STATION	VEC3	CARWASH	RET15	HOME FURNISHINGS
INS11	FIRE STATION	VEC4	REPAIR/SERVICE	RET16	HOME IMPROVEMENT
INS12	SENIOR CENTER	VEC5	NEW/ USED SALES	RET17	HOTEL/ MOTEL
INS13	ASSOCIATION	VEC6	AUTOPARTS	RET18	JEWELRY
INS14	LIBRARY	VEC7	STORAGE	RET19	LAUNDRY/ DRY CLEANER
INS15	POST OFFICE	VEC8	AUTO RENTAL	RET20	LOCKSMITH
INS16	PARKING			RET21	MARTIAL ARTS
INS17	PRISON/ DETENTION CENTER	OS	OPEN SPACE	RET22	MINIMART
INS18	TRANSIT CENTER/ STATION	OS1	PUBLIC PARK	RET23	MORTUARY
		OS2	CEMETARY	RET24	MUSIC
IND	INDUSTRIAL USE	OS3	PLAZA	RET25	PETS
IND1	INDUSTRIAL SERVICE	OS4	GARDEN	RET26	PHARMACY
IND2	MANUFACTURING/ PRODUCTION	OS5	CEMETARY	RET27	PHOTO
IND3	RAILROAD YARDS	OS6	GOLF COURSE	RET28	RECYCLING DROPOFF
IND4	WAREHOUSE/ FREIGHT MOVEMENT	OS7	RECREATIONAL TRAIL	RET29	RESTAURANT
IND5	WASTE RELATED			RET30	SPECIALTY GROCERY
IND6	WHOLESALE SALES	VAC	VACANT	RET31	STATIONARY
IND7	EQUIPMENT STORAGE	VAC1	VACANT PARCEL	RET32	SUPERMARKET
IND8	PARKING	VAC2	VACANT BUILDING	RET33	TAILOR
IND9	CONSTRUCTION/PLUMBING			RET34	TANNING
				RET35	TAVERN
COM	COMMERCIAL/ OFFICE USE			RET36	UPHOLSTERY/ DRAPES
COM1	PROFESSIONAL SERVICES			RET37	VETERINARIAN
COM2	MEDICAL/ DENTAL			RET38	VIDEOS
COM3	FINANCIAL			RET39	BAKERY
COM4	REAL ESTATE			RET40	TOY/ NOVELTY STORE
COM5	PUBLIC UTILITY			RET41	PARKING
COM6	CORPORATE OFFICE			RET42	SPORTING GOODS
COM7	PARKING			RET43	FLORIST
COM8	LEGAL SERVICES			RET44	PLANT NURSERY



POL → Government → Bureaus & Offices → Transportation → Projects & Planning
→ Completed Projects and Reports → Studies, Plans, and Reports → **Appendix C Descriptors Background Report**

Appendix C includes a copy of the background report used to develop the center descriptors.

Development of Descriptors

The City of Portland's Office of Transportation received a Transportation Growth Management Grant from the State of Oregon to develop a methodology for setting mode split targets and identifying implementation strategies for areas identified as "centers" in the 2040 Growth Concept developed by Metro, the regional government for the Portland metropolitan region.

A key element in the methodology for establishing mode split targets and implementation strategies is the use of land use and transportation descriptors. Allan Jacobs captures the essence of the descriptor in the following quote:

"A clue or indicator [or descriptor] is something that can be seen that tells the observer something he or she desires to know. [Descriptors] help the observer understand the nature of the urban environment being examined." (Jacobs 1985)

This background report describes the policy context for identifying and applying descriptors; details the supporting research used to select the descriptors; and identifies a list of descriptors that will be used to evaluate Portland's 2040 centers.

Policy Context

The State of Oregon's Transportation Planning Rule requires local jurisdictions to include interim benchmarks in transportation system plans (TSP).

Research and Development

The development of key descriptors flowed from the basic premise that the choice to take transit, walk, bicycle, or carpool is influenced by a broad range of factors including urban form, transportation infrastructure, and socio-economic factors.

Research Limitations

At the outset, it is important to note that an analytic framework of research providing quantitative connections between urban form characteristics and travel behavior is limited in several important respects.

Research Findings

If you have any questions or comments on our site, please contact our site administrator.

A general consensus has emerged regarding the significance of several characteristics associated with alternative mode use, and their relative rankings in importance, if not their precise effects on travel behavior.

Other Community Descriptor Projects

Numerous communities are turning to descriptor (indicators) to measure progress towards community goals.

Preliminary Descriptors

A brief discussion of how they were selected; and the method for calculation.

Conclusions

As the Centers projects moves forward, the next steps include applying the descriptors to the different study areas and analyzing the findings against Metro's travel forecast data.

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→ [Completed Projects and Reports](#) → [Studies, Plans, and Reports](#)
→ **Appendix D Economic Development Allocation Analysis**

Allocations 122nd Station Community

The following memorandum provides the methodology and results of an economic development allocation analysis for the 122nd Avenue Light Rail Station Area.

If you have any questions or comments on our site, please contact our site administrator.

Allocations Hillsdale Town Center

The following memorandum provides the methodology and results of an economic development allocation analysis for the Hillsdale Town Center.

Allocations St. Johns Town Center

The following memorandum provides the methodology and results of an economic development allocation analysis for the St. Johns Town Center.

Allocations West Portland Town Center

The following memorandum provides the methodology and results of an economic development allocation analysis for the West Portland Town Center.

Allocations 60th Station Community

The following memorandum provides the methodology and results of an economic development allocation analysis for the 60th Avenue Light Rail Station Area.

Allocations 82nd Station Community

The following memorandum provides the methodology and results of an economic development allocation analysis for the 82nd Avenue Light Rail Station Area.

Allocations 148th Station Community

The following memorandum provides the methodology and results of an economic development allocation analysis for the 148th Avenue Light Rail Station Area.

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POL → Government → Bureaus & Offices → Transportation → Projects & Planning
→ Completed Projects and Reports → Studies, Plans, and Reports → **Appendix E Existing Conditions Profiles**

Case Study 1 Hillsdale Town Center (PDF Document, 1,185kb)

The Hillsdale Town Center is centrally located in the heart of Southwest Portland.

Case Study 2 St. Johns Town Center (PDF Document, 1,496kb)

St. Johns Town Center is located on the North Portland peninsula.

Case Study 3 West Portland Town Center (PDF Document, 1,272kb)

West Portland Town Center is located in Southwest Portland, in the area surrounding the intersection of Capitol Highway and Barbur Blvd.

Case Study 4 60th Station Community (PDF Document, 1,209kb)

The 60th Station Area encompasses 344 acres surrounding the 60th MAX station.

Case Study 5 82nd Station Community (PDF Document, 1,175kb)

The heart of the 82nd Avenue station area is the Northeast 82nd Avenue MAX station, on the north side of Interstate 84.

Case Study 6 122nd Station Community (PDF Document, 1,119kb)

The 122nd Station Area is centered on the Eastside MAX station at NE 122nd Avenue and East Burnside.

Case Study 7 148th Station Community (PDF Document, 889kb)

The 148th Station Area is centered on the Eastside MAX station at 148th Avenue and East Burnside.

PDF Information

Some of the links on this page are to PDF documents. To open PDF files you will need Adobe Acrobat Reader installed on your computer, it is available for free from Adobe.com.



If you have any questions or comments on our site, please contact our site administrator.

2040 Centers Transportation Strategies and Mode Split Project - Mode Split by Activity

Hillsdale Transit Center (Zone 37)

NON-HOMEBASED NON-WORK TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994	2020			1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	5347	98%	5717	96%	71	1%	216	4%	2	0%	3	0%	18	0%	25	0%
Attraction	5372	99%	5839	98%	38	1%	85	1%	3	0%	4	0%	23	0%	33	1%
	10719	99%	11556	97%	109	1%	301	3%	5	0%	7	0%	41	0%	58	0%
PM																
Production	928	100%	1001	99%	4	0%	12	1%								
Attraction	928	100%	1001	99%	4	0%	12	1%								

COLLEGE TRIPS

Mode	Auto				Transit				Walk/Bike			
	1994	2020			1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	469	67%	84	52%	180	26%	225	38%	51	7%	69	10%
Attraction	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	469	34%	84	26%	180	13%	225	19%	51	4%	69	5%
PM												
Production	7	35%	5	23%	13	65%	18	77%				
Attraction	41	80%	31	69%	10	20%	14	31%				

SCHOOL TRIPS

Mode	Auto				Transit				Walk/Bike				School Bus			
	1994	2020			1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	70	5%	70	5%	258	19%	257	19%	744	54%	741	54%	304	22%	303	22%
Attraction	83	5%	83	5%	306	19%	305	19%	880	54%	877	54%	360	22%	359	22%
	153	5%	153	5%	564	19%	562	19%	1624	54%	1618	54%	664	22%	662	22%
PM																
Production	10	25%	10	24%	30	75%	30	76%								
Attraction	8	23%	8	24%	27	77%	26	76%								

2040 Centers Transportation Strategies and Mode Split Project - Mode Split by Activity
St. Johns Town Center (Zone 97)

HOMEBASED WORK TRIPS

Mode	Drive Alone				Shared Ride				Transit				Bike			
	1994	2020			1994	2020			1994	2020			1994	2020		
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	2790	69%	2780	59%	609	15%	729	15%	374	9%	789	17%	145	4%	256	5%
Attraction	3309	74%	3416	67%	599	13%	809	16%	224	5%	551	11%	108	2%	126	2%
PM																
Production	681	79%	701	70%	125	15%	167	17%	55	6%	135	13%				
Attraction	591	73%	591	63%	127	16%	153	16%	90	11%	190	20%				

HOMEBASED OTHER TRIPS

Mode	Drive Alone				Shared Ride				Transit				Bike			
	1994	2020			1994	2020			1994	2020			1994	2020		
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	5057	55%	5965	55%	2817	30%	2893	26%	290	3%	649	6%	187	2%	235	2%
Attraction	6097	55%	7880	55%	3397	30%	3823	27%	284	3%	617	4%	261	2%	356	2%
PM		Auto														
Production	1476	97%	1766	94%					53	3%	117	6%				
Attraction	1412	96%	1654	93%					54	4%	120	7%				

NON-HOMEBASED WORK TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994	2020			1994	2020			1994	2020			1994	2020		
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	2191	98%	2486	95%	34	2%	66	3%	4	0%	5	0%	37	1%	51	2%
Attraction	3955	98%	6227	97%	41	1%	114	2%	6	0%	10	0%	57	1%	81	1%
PM																
Production	464	98%	549	97%	9	2%	17	3%								
Attraction	779	99%	1214	98%	8	1%	28	2%								

St. Johns Town Center (Zone 97)

NON-HOMEBASED NON-WORK TRIPS

Mode	Drive Alone				Transit				Bike				Walk			
AWD	1994		2020		1994		2020		1994		2020		1994		2020	
	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	5987	97%	9467	94%	56	1%	131	2%	10	0%	18	0%	152	2%	289	3%
Attraction	5990	97%	9526	96%	42	1%	131	1%	11	0%	18	0%	163	2%	300	3%
PM																
Production	1037	100%	1645	1%	4	0%	14	1%								
Attraction	1037	100%	1645	1%	4	0%	14	1%								

COLLEGE TRIPS

Mode	Auto				Transit				WABI			
AWD	1994		2020		1994		2020		1994		2020	
	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	245	60%	254	57%	47	12%	66	15%	113	28%	126	28%
Attraction	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
PM												
Production	4	57%	4	46%	3	43%	5	54%				
Attraction	21	88%	22	86%	3	12%	4	14%				

SCHOOL TRIPS

Mode	Auto				Transit				WABI				School Bus			
AWD	1994		2020		1994		2020		1994		2020		1994		2020	
	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	56	5%	66	5%	206	19%	243	2%	594	54%	699	24%	243	22%	286	22%
Attraction	57	5%	70	5%	210	19%	257	19%	604	54%	738	54%	247	22%	302	22%
PM																
Production	7	25%	8	24%	21	75%	26	76%								
Attraction	7	25%	8	24%	21	75%	25	76%								

2040 Centers Transportation Strategies and Mode Split Project - Mode Split by Activity
West Portland Town Center (Zone 53)

HOMEBASED WORK TRIPS

Mode	Drive Alone				Shared Ride				Transit				Bike			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	2890	71%	2966	55%	602	15%	944	18%	473	12%	1164	22%	64	2%	188	4%
Attraction	5482	80%	5876	71%	935	14%	1310	16%	255	4%	754	9%	81	1%	125	2%
	8372	75%	8842	63%	1537	14%	2254	17%	728	8%	1918	15%	145	1%	313	3%
PM																
Production	1098	81%	1175	72%	189	14%	267	16%	63	5%	185	11%				
Attraction	648	73%	669	58%	131	15%	203	18%	114	13%	281	24%				

HOMEBASED OTHER TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	6703	92%	6502	83%	265	4%	727	9%	41	1%	67	1%	309	4%	492	6%
Attraction	7925	94%	8644	91%	110	1%	308	3%	46	1%	65	1%	388	5%	517	5%
	14628	93%	15146	87%	375	2%	1035	6%	87	1%	132	1%	697	4%	1009	6%
PM																
Production	1230	92%	1301	94%	29	2%	81	6%								
Attraction	1192	97%	1217	92%	41	3%	113	8%								

NON-HOMEBASED WORK TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	3448	99%	4054	97%	40	1%	121	3%	2	0%	2	0%	1	0%	15	0%
Attraction	1831	98%	2089	95%	31	2%	89	4%	1	0%	1	0%	1	0%	13	1%
	5279	98%	6143	96%	71	1%	210	3%	3	0%	3	0%	2	0%	28	0%
PM																
Production	677	99%	796	96%	10	1%	30	4%								
Attraction	391	99%	447	95%	5	1%	23	5%								

West Portland Town Center (Zone 53)

NON-HOMEBASED NON-WORK TRIPS

Mode	Auto				Transit				Bike				Walk			
AWD	1994		2020		1994		2020		1994		2020		1994		2020	
	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	2603	98%	2135	95%	35	1%	135	4%	1	0%	2	0%	11	0%	18	1%
Attraction	2619	99%	3209	98%	19	1%	64	2%	1	0%	2	0%	10	0%	16	0%
	5222	99%	5344	96%	54	1%	199	3%	2	0%	4	0%	21	0%	34	1%
PM																
Production	452	100%	549	99%	2	0%	8	1%								
Attraction	452	100%	549	99%	2	0%	8	1%								

COLLEGE TRIPS

Mode	Auto				Transit				WABI			
AWD	1994		2020		1994		2020		1994		2020	
	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	267	66%	6	57%	47	12%	85	18%	90	22%	124	26%
Attraction	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	267	33%	6	28%	47	6%	85	9%	90	11%	124	13%
PM												
Production	4	57%	4	41%	3	43%	6	59%				
Attraction	23	88%	24	79%	3	12%	5	21%				

SCHOOL TRIPS

Mode	Auto				Transit				WABI				School Bus			
AWD	1994		2020		1994		2020		1994		2020		1994		2020	
	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	39	5%	46	5%	142	19%	167	19%	408	54%	481	54%	167	22%	197	22%
Attraction	45	5%	53	5%	165	19%	196	19%	474	54%	563	54%	194	22%	230	22%
	84	5%	99	5%	307	19%	363	19%	882	54%	1044	54%	361	22%	427	22%
PM																
Production	5	24%	6	24%	16	76%	20	76%								
Attraction	5	25%	5	24%	15	75%	17	76%								

2040 Centers Transportation Strategies and Mode Split Project - Mode Split by Activity

60th Station Area (Zone 58)

HOMEBASED WORK TRIPS

Mode	Drive Alone				Shared Ride				Transit				Bike			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	2106	60%	1516	40%	570	16%	786	21%	571	16%	1026	27%	143	4%	291	8%
Attraction	3403	75%	2779	59%	612	13%	710	15%	295	6%	974	21%	86	2%	109	2%
	5509	67%	4295	49%	1182	15%	1496	18%	866	11%	2000	24%	229	3%	400	5%
PM																
Production	687	77%	558	59%	127	14%	163	16%	73	8%	237	25%				
Attraction	462	64%	338	45%	120	17%	149	22%	137	19%	249	33%				

HOMEBASED OTHER TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	6304	85%	5232	73%	433	6%	1032	14%	133	2%	166	2%	546	7%	703	10%
Attraction	7488	89%	6840	85%	273	3%	542	7%	92	1%	107	1%	527	6%	600	7%
	13792	87%	12072	79%	706	5%	1574	11%	225	1%	273	2%	1073	7%	1303	9%
PM																
Production	1170	95%	1035	93%	60	5%	129	7%								
Attraction	1124	94%	972	85%	72	6%	165	15%								

NON-HOMEBASED WORK TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994	2020			1994	2020			1994	2020			1994	2020		
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	2258	97%	2327	96%	34	1%	60	2%	3	0%	3	0%	21	1%	25	1%
Attraction	2293	97%	2290	95%	46	2%	81	3%	3	0%	4	0%	19	1%	24	1%
	4551	97%	4617	96%	80	2%	141	3%	6	0%	7	0%	40	1%	49	1%
PM																
Production	455	98%	471	97%	9	2%	15	3%								
Attraction	464	98%	464	96%	9	1%	20	4%								

60th Station Area (Zone 58)

NON-HOMEBASED NON-WORK TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994	2020			1994	2020			1994	2020			1994	2020		
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	3575	98%	3726	96%	44	1%	107	3%	4	0%	4	0%	8	1%	45	1%
Attraction	3590	98%	3768	97%	33	1%	61	2%	3	0%	4	0%	34	1%	45	1%
	7165	98%	7494	97%	77	1%	168	2%	7	0%	8	0%	42	1%	90	1%
PM																
Production	621	100%	649	99%	3	0%	7	1%								
Attraction	621	100%	649	99%	3	0%	7	1%								

COLLEGE TRIPS

[illegible]

Production	2	14%	1	5%	12	86%	16	95%
Attraction	13	59%	5	29%	9	41%	13	71%

SCHOOL

Mode	Auto				Transit				Walk/Bike				School Bus			
	1994	2020			1994	2020			1994	2020			1994	2020		
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	42	5%	44	5%	155	19%	162	19%	446	54%	446	54%	182	22%	191	22%
Attraction	42	5%	43	5%	154	19%	157	19%	442	54%	452	54%	181	22%	185	22%
	84		87		309		319		888		898		363		376	
PM																
Production	5	24%	5	24%	16	76%	16	76%								
Attraction	5	24%	5	24%	16	76%	16	76%								

2040 Centers Transportation Strategies and Mode Split Project - Mode Split by Activity

82nd Station Area (Zone 66)

HOME BASED WORK TRIPS

Mode	Drive Alone				Shared Ride				Transit				Bike			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	1683	67%	1477	52%	386	15%	475	17%	285	11%	610	21%	99	4%	209	7%
Attraction	1334	77%	1270	64%	236	14%	333	17%	77	4%	279	14%	27	2%	37	2%
	3017	72%	2747	58%	622	15%	808	17%	362	8%	889	18%	126	3%	246	5%
PM																
Production	284	80%	1217	66%	52	15%	72	18%	20	6%	69	17%				
Attraction	345	70%	305	56%	78	16%	97	18%	68	14%	146	27%				

HOME BASED OTHER TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	4862	88%	4863	81%	226	4%	572	10%	97	2%	127	2%	330	6%	417	7%
Attraction	4160	92%	3938	88%	114	3%	223	5%	40	1%	52	1%	229	5%	227	6%
	9022	90%	8801	85%	340	3%	795	7%	137	1%	179	2%	559	6%	644	7%
PM																
Production	736	98%	714	92%	28	2%	61	8%								
Attraction	764	96%	750	90%	36	5%	87	10%								

NO HOME WORK

Mode	Auto				Transit				Bike				Walk			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	861	98%	982	97%	9	1%	17	2%	1	0%	2	0%	7	1%	8	1%
Attraction	1115	98%	1035	97%	17	2%	22	2%	1	0%	1	0%	5	0%	6	1%
	1976	98%	2017	97%	26	1%	39	2%	2	0%	3	0%	12	1%	14	1%
PM																
Production	167	99%	199	98%	2	1%	4	2%								
Attraction	223	100%	209	97%	1	0%	6	3%								

82nd Station Area (Zone 66)

NO HOME NO WORK

Mode	Auto				Transit				Bike				Walk			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	1961	98%	1949	97%	18	1%	37	2%	2	0%	2	0%	20	1%	21	1%
Attraction	1971	99%	1966	98%	13	1%	21	1%	1	0%	2	0%	14	1%	19	1%
	3932	98%	3915	97%	31	1%	58	1%	3	0%	4	0%	34	1%	40	1%
PM																
Production	341	100%	339	99%	1	0%	2	1%								
Attraction	341	100%	339	99%	1	0%	2	1%								

COLLEGE TRIPS

Mode	Auto				Transit				Walk/Bike			
	1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	126	50%	35	25%	113	45%	171	67%	13	5%	21	8%
Attraction	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
PM	126	25%	35	12%	113	22%	171	34%	13	3%	21	4%

Production	2	15%	1	7%	8	85%	12	93%
Attraction	11	65%	6	37%	6	35%	9	63%

SCHOOL TRIPS

Mode	Auto				Transit				Walk/Bike				School Bus			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	33	5%	36	5%	119	19%	132	19%	344	54%	380	54%	141	22%	155	22%
Attraction	29	5%	31	5%	106	19%	114	19%	305	54%	329	54%	125	22%	135	22%
	62	5%	67	5%	225	19%	246	19%	649	54%	709	54%	266	22%	290	22%
PM			4													
Production	3	21%	4	24%	1	79%	12	76%								
Attraction	4	25%		24%	12	75%	13	76%								

2040 Centers Transportation Strategies and Mode Split Project - Mode Split by Activity

122nd Station Area (Zone 62)

HOMEBASED WORK TRIPS

Mode	Drive Alone				Shared Ride				Transit				Bike			
	1994		2020		1994		2020		1994		2020		1994		2020	
	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
AWD																
Production	2551	73%	2199	51%	505	14%	617	14%	353	10%	617	29%	45	1%	173	4%
Attraction	2100	78%	2159	62%	365	14%	548	16%	133	5%	548	18%	35	1%	59	2%
	4651	76%	4358	57%	870	14%	1165	15%	486	8%	1165	23%	80	1%	232	3%
PM																
Production	446	80%	451	63%	79	14%	116	16%	33	6%	152	21%				
Attraction	524	74%	458	52%	103	14%	127	14%	85	12%	295	34%				

HOMEBASED OTHER TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994		2020		1994		2020		1994		2020		1994		2020	
	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
AWD																
Production	7317	92%	7535	82%	262	3%	960	10%	44	1%	117	1%	300	4%	558	6%
Attraction	7513	93%	10263	88%	206	3%	694	6%	44	1%	108	1%	338	4%	631	5%
	14830	93%	17798	85%	468	3%	1654	8%	88	1%	225	1%	638	4%	1189	6%
PM																
Production	1237	93%	1534	91%	423	7%	145	9%								
Attraction	1229	93%	1426	90%	464	7%	165	10%								

NON-HOMEBASED WORK TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	1343	99%	1706	97%	14	1%	34	2%	1	0%	2	0%	5	0%	22	1%
Attraction	2656	99%	5121	97%	33	1%	119	2%	1	0%	4	0%	5	0%	27	1%
	3999	99%	6827	97%	47	1%	153	2%	2	0%	6	0%	10	0%	49	1%
PM																
Production	282	99%	387	98%	4	1%	9	2%								
Attraction	521	99%	994	97%	5	1%	29	3%								

122nd Station Area (Zone 62)

NON-HOMEBASED NON-WORK TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	4284	99%	8084	97%	39	1%	146	2%	2	0%	8	0%	24	1%	98	1%
Attraction	4294	99%	8125	98%	30	1%	104	1%	2	0%	7	0%	20	0%	91	1%
	8578	99%	16209	97%	69	1%	250	2%	4	0%	15	0%	44	1%	189	1%
PM																
Production	743	100%	1404	99%	3	0%	10	1%								
Attraction	743	100%	1404	99%	3	0%	10	1%								

COLLEGE TRIPS

Mode	Auto				Transit				Walk/Bike			
	1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	242	66%	53	26%	113	31%	271	67%	14	4%	27	7%
Attraction	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	242	33%	53	13%	113	15%	271	34%	14	2%	27	3%

PM
Production
Attraction

4	33%	2	8%	8	67%	19	92%
21	78%	9	38%	6	22%	15	62%

SCHOOL TRIPS

Mode	Auto				Transit				Walk/Bike				School Bus			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	68	8%	82	8%	16	2%	19	2%	240	28%	286	28%	530	62%	632	62%
Attraction	77	8%	88	8%	18	2%	20	2%	270	28%	309	28%	596	62%	682	62%
	145	8%	170	8%	34	2%	39	2%	510	28%	595	28%	1126	62%	1314	62%
PM																
Production	9	82%	10	83%	2	18%	2	17%								
Attraction	8	80%	10	83%	2	20%	2	17%								

2040 Centers Transportation Strategies and Mode Split Project - Mode Split by Activity
148th Station Area (Zone 44)

HOMEBASED WORK TRIPS

Mode	Drive Alone				Shared Ride				Transit				Bike			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	504	75%	645	51%	90	13%	174	14%	68	10%	381	30%	5	1%	40	3%
Attraction	125	79%	322	61%	21	13%	79	15%	8	5%	105	20%	2	1%	8	1%
	629	77%	967	56%	111	13%	253	14%	76	7%	486	25%	7	1%	48	2%
PM																
Production	33	80%	73	62%	222	15%	18	15%	2	5%	95	23%				
Attraction	99	74%	129	51%	6	14%	35	14%	16	12%	91	36%				

HOMEBASED OTHER TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	1370	95%	2098	84%	36	3%	272	11%	3	0%	28	1%	37	3%	104	4%
Attraction	597	93%	1035	86%	14	2%	78	7%	3	0%	11	1%	29	4%	72	6%
	1967	94%	3133	85%	50	2%	350	9%	6	0%	39	1%	66	4%	176	5%
PM																
Production	148	78%	240	90%	4	2%	25	10%								
Attraction	179	97%	281	88%	6	3%	40	12%								

NON-HOMEBASED WORK TRIPS

Mode	Auto				Transit				Bike				Walk			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	79	99%	263	97%	1	1%	6	2%	0	0%	0	0%	0	0%	1	0%
Attraction	14	99%	44	97%	0	1%	1	3%	0	0%	0	0%	0	0%	0	0%
	93	99%	307	97%	1	1%	7	2%	0	0%	0	0%	0	0%	1	0%
PM																
Production	14	100%	51	97%	0	0%	1	3%								
Attraction	4	100%	12	97%	0	0%	0	3%								

148th Station Area (Zone 44)

NON-HOMEBASED NON-WORK TRIPS

Mode	Auto				Transit				Bike				Walk				
	1994		2020		1994		2020		1994		2020		1994		2020		
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	
	Production	145	99%	268	97%	1	1%	5	2%	0	0%	0	0%	0	0%	2	1%
	Attraction	146	100%	269	98%	1	1%	4	1%	0	0%	0	0%	0	0%	2	1%
		291	99%	537	98%	2	1%	9	2%	0	0%	0	0%	0	0%	4	1%
PM																	
	Production	25	100%	47	99%	0	0%	0	1%								
	Attraction	25	100%	47	99%	0	0%	0	1%								

COLLEGE TRIPS

[illegible]

Production	1	50%	1	11%	1	50%	5	89%
Attraction	5	100%	3	48%	0	0%	4	52%

SCHOOL TRIPS

Mode	Auto				Transit				Walk/Bike				School Bus			
	1994		2020		1994		2020		1994		2020		1994		2020	
AWD	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS	Trips	MS
Production	14	8%	27	8%	3	2%	6	2%	50	28%	93	28%	111	62%	206	62%
Attraction	18	8%	32	8%	4	2%	7	2%	62	28%	113	28%	138	62%	250	62%
	32	8%	59	8%	7	2%	13	2%	112	28%	206	28%	249	62%	456	62%
PM																
Production	2	100%	4	84%	0	0%	1	16%								
Attraction	2	100%	3	83%	0	0%	1	17%								

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Policy Context - Printable Version

The City of Portland's interest in developing land use and transportation descriptors, which measure characteristics of 2040 centers likely to result in higher alternative mode splits and a reduction in vehicle miles traveled, developed in response to state and regional transportation policy.

The State of Oregon's Transportation Planning Rule requires local jurisdictions to include interim benchmarks in transportation system plans (TSP). The TSP monitor progress towards increasing the mode share of non-auto trips, increasing average auto occupancy rates, and decreasing the length and number of vehicle trips per capita. Local governments are required to evaluate progress in meeting interim benchmarks at five year intervals from the adoption of the TSP.

Title 6 of Metro's Urban Growth Management Functional Plan requires local jurisdictions to establish mode split targets for non-single occupancy modes and identify strategies for meeting these targets for 2040 design types. The targets and implementation strategies are included in local transportation system plans.

The descriptors serve several objectives in addressing the state and regional directives described above. They operate as a set of quantitative assessment measures that define each center with respect to land use and transportation characteristics associated with increased use of alternative modes. Their application includes tracking growth and change of each center over time, uniquely identifying of each center for comparative analysis, and gauging the effectiveness of land use and transportation policies and investments over time.

For the purposes of the Centers Project, the descriptors will be used in the evaluation of each center's ability to meet the Metro's mode split target and in the development of implementation strategies. The descriptors will be used in conjunction with information derived from Metro's Travel Forecast Model to produce an assessment of each center's ability to achieve Metro's alternative mode splits targets. Implementation strategies will be developed based on identified strengths and weaknesses. The descriptors will produce baseline data for each center that can then be measured against data collected in the five-year evaluation of Portland's TSP.

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Research and Development - Printable Version

The development of key descriptors flowed from the basic premise that the choice to take transit, walk, bicycle, or carpool is influenced by a broad range of factors including urban form, transportation infrastructure, and socioeconomic factors. The weight of land use and transportation planning research findings largely support this assumption.

The research undertaken for this project focused on defining the key elements of land use patterns, transportation, and demographics that are most predictive of mode choice. Research methods included reviewing academic studies, previous planning documents, and interviews with planning professionals.

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Research Limitations - Printable Version

At the outset, it is important to note that an analytic framework of research providing quantitative connections between urban form characteristics and travel behavior is limited in several important respects.

First, the number and nature of available research data on the transportation choice-built environment relationship does not provide clear and solid guidance for the analysis desired. The lack of reliable empirical data and the limits on inferences that can reasonably be drawn from it is a common feature of discussions of research in this area:

The lack of detailed understanding of the relationships between urban form and travel behavior remains an obstacle to a more refined impact analysis:

"Most research on the link between urban form and travel behavior has relied on relatively coarse data on both urban form and travel patterns and those found aggregate-level correlation between them. [E.g., residential density or form vs. amount of travel.] It leaves open the question of the more detailed relationship between urban form and travel behavior, that is, which characteristics of urban form influence which aspects of travel choice. This sort of detailed understanding of the relationship is needed if we are to better understand the potential impact of alternative land use policies on travel behavior. We still cannot answer questions like: "What will the new supermarket mean for residents' travel?" "What differences will this site plan make versus that site plan?" "What happens if the corner store closes down?" (Handy 1992.)

The challenge arises in part from a mismatch between the data gathering focus of regional transportation planning and the requirements of smaller scale analyses of land-transportation relationships and their effects on travel behavior:

In general, the absence of rich land use and urban design data at the tract level is a significant barrier to carrying out neighborhood-scale studies of how the build environment shapes travel demand. From regional travel surveys...there are rarely enough travel diary data points for conducting small-scale analyses. And while metropolitan planning organizations generally have detailed travel data, there are no readily available secondary sources that provide parcel-level or even block-level summaries of land use composition, building characteristics, or features of the walking environment...[U]ntil travel diary data

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are compiled for at least thirty households per tract across at least fifty tracts within a metropolitan area, and until detailed land use and urban design data are likewise compiled for the same fifty or more tracts, there will unlikely be a sufficiently rich data base for accurately measuring the impacts of neighborhood built environments on split modes. At present, there are no secondary data sources in any metropolitan area that meet such data requirements. (TCRP 1996, p. 49.)

Data availability, relative coarseness, the poor quality of land use data, and the need for significant improvement in its quality are commonly cited in researchers' discussions of study limitations. (E.g., Cervero 1996, Ewing 1996, Calthorpe 1996.) Walk trips, especially, are difficult to model at the neighborhood level, due to their infrequent reporting. (Cervero 1996). This means that even the travel diary coverage mentioned above would permit only limited inference regarding the association between change in the measured characteristic and the choice to walk.

A second significant limitation, made worse by the lack of data, is the problem of multi-collinearity. Characteristics of travel behavior do not operate independently, and in fact tend to be found together:

Collectively, the research results from [Transportation Cooperative Research Program] as well as those from other recent studies underscore the methodological dilemma of studying the travel impacts of built environments. It is nearly impossible to develop well-specified statistical models that allow one to accurately gauge the individual importance of many features of the built environment. Consistently in our work and the work of others, once density entered model equations, the remaining built environment variables added little significant marginal explanatory power. The reality is that wherever one finds fairly compact neighborhoods in U.S. cities, these neighborhoods also tend to have more varied land uses, average shorter block lengths, narrower streets, more grid-like street patterns, continuous sidewalk networks, etc. (TCRP 1996, p. 49.)

These findings are also echoed in a recent summary of studies regarding the relationship between the urban environment and transit ridership. It notes three successive obstacles to inference. First, while characteristics often are found together, their effects are difficult to separate. Second, uncontrolled variables complicate apparently straightforward relationships found in simple correlational studies. Third, when controls are introduced the relationships become fuzzier. (Ewing, 1996).

In addition, some researchers feel that the relationship between environmental factors and travel behavior is weak because they are the result of locational decisions based on peoples' attitudes toward travel (those who prefer to walk will move to pedestrian-friendly neighborhoods while those who prefer to drive will move to automobile-oriented neighborhoods). According to this view, neighborhoods with higher densities, greater diversity and pedestrian- and transit-oriented features will not greatly affect a city's overall travel characteristics because they merely draw residents from other neighborhoods with similar qualities rather than attract residents from neighborhoods that do not support alternative travel modes.

Due to the lack of data revealing residential movements, a few researchers have included questions related to residents' attitudes in their travel behavior surveys in order to determine whether travel behavior is more dependent on land-use or attitudes and have found that attitudes do have a significant influence (Handy 1996, Kitamura et al 1997). A shortcoming of this approach, however, is that it still does not tell us anything about the neighborhood in which the individual lived previously. Even if a person prefers to walk or bus to their destinations, they may actually drive instead because a lack of limited residential choices has forced them to live in a neighborhood that makes the use of alternative modes difficult or unfeasible. Higher density, more diverse

development is therefore more about providing people that prefer to walk or bus with residential choices that support their modal preference than about converting those who prefer to drive.

Overall, the problems of data availability and collinearity restate the challenge in attempting to define and measure a set of environmental descriptors associated with changing travel behaviors. Handy's summary of the research emphasizes a research need and raises a caution regarding interpretation of research results that is still current: "The glaring gap in the literature is empirical time-series analysis. Research of this type is needed in order to draw more positive conclusions about causal relationships between spatial structure and travel patterns, particularly with respect to the effect of changes in spatial structure." (Handy 1992, p.3.)

With specific reference to the Centers project, the caveats to developing a set of descriptors as defined by academia provided a cautionary tale as to the depth of application of the descriptors. The descriptors serve only as a measure of the degree to which each center exhibits characteristics deemed desirable to walking, bicycling, and transit, and which complement its desired 2040 design type. The research described in the next section lays the groundwork for the selection of specific descriptors.

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Research Findings - Printable Version

Bearing in mind the limits to the research, a general consensus has emerged regarding the significance of several characteristics associated with alternative mode use, and their relative rankings in importance, if not their precise effects on travel behavior. For example, "Standard beliefs about the relationships between urban structure and travel patterns are generally, though not universally supported in the studies reviewed, particularly the relationship between higher densities and decreases in both number of trips taken and the automobile mode split." (Handy 1992).

1. Density

Research summaries emphasize the primacy and consistency of density as an explanatory variable of the urban environment associated with reduced automobile use in favor of alternative modes. The relationship applies to residential and employment densities in combination (and transit use) across a range of center types. Density has been found to be more strongly associated with alternative mode choice than any other characteristic. (TCRP 1996). While density is not reducible to a single threshold, research suggests guidelines for specific circumstances. The figures 1 and 2 illustrate density-mode choice findings from studies in San Francisco and the Puget Sound area, respectively. The Puget Sound area threshold densities were far above average residential and employment (not shown) densities for the region.

Figure 1: Influence of Residential Densities on Drive Alone Commuting in San Francisco Bay Area 1990 (Source: Cervero 1997)

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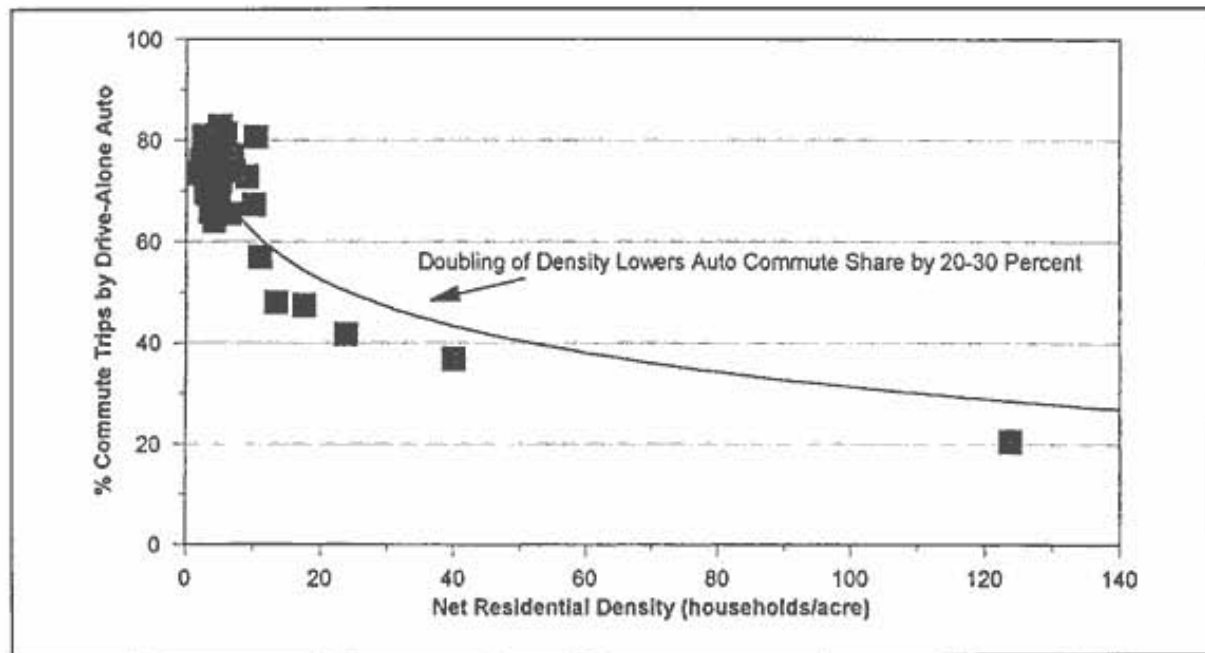
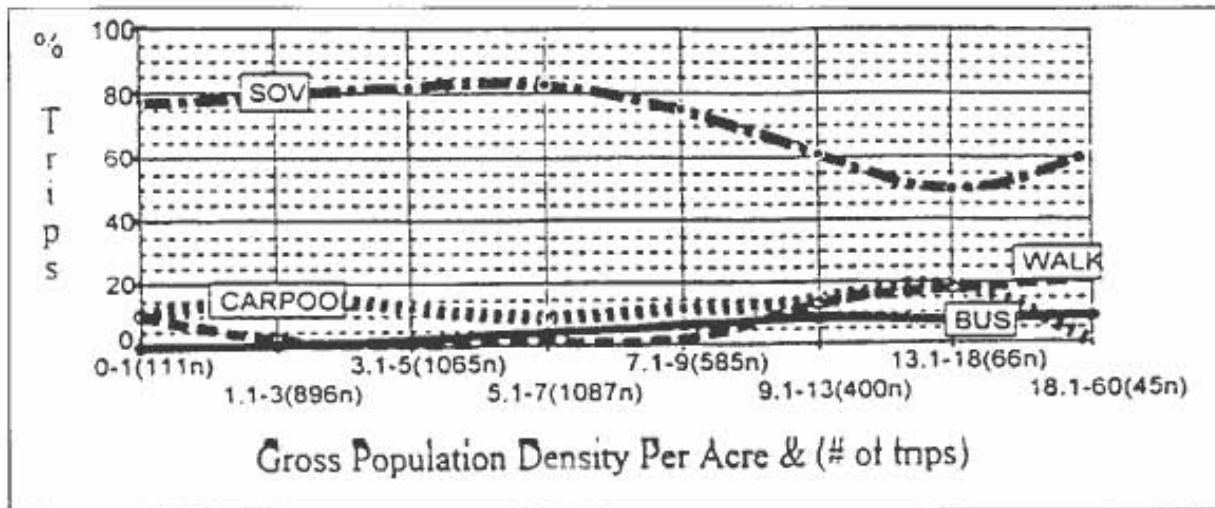


Figure 2: Modal Percentages Compared to Population Density (Source: Frank and Pivo 1994)



For commuting trips, increased density at both ends of the trip is associated with increased alternative mode use. The relationship has been found to be stronger when associated with richer land use mixes (e.g., at employment centers that include readily accessible retail). (Cervero 1988.) Descriptor variables must reflect the different factors that affect mode choice at each end, or, in the case of mixed use areas, combinations of those factors. (Ewing, 1996 regarding transit trips.)

Additional evidence of the influence of density on travel behavior comes from a study conducted for Portland's transit agency Tri-Met. The Primary Transit Network project attempted to quantify the dependence of transit demand on land use and demographics in order to develop an assessment measure for potential transit demand. The report concluded that out of "40 land use and demographic variables studied, the most significant for determining transit demand are the overall housing density per acre, and the overall employment density per acre. These two variables alone predict 93% of the variance in transit demand among different parts of the region." (Nelson\Nygard 1995).

Consistency in the relationship between density and travel behavior has implications for land use policy that encourages transit, pedestrian, and bicycle-friendly development. The greatest benefits are achieved by moving from very low densities (4 units/acre) to moderate densities (10 to 15 units/acre). This adjustment is the equivalent of going from ¼ acre single-family lots to a neighborhood of smaller single family lots mixed with duplexes and triplexes. (Bernick, Cervero 1997)

2. Land Use Diversity

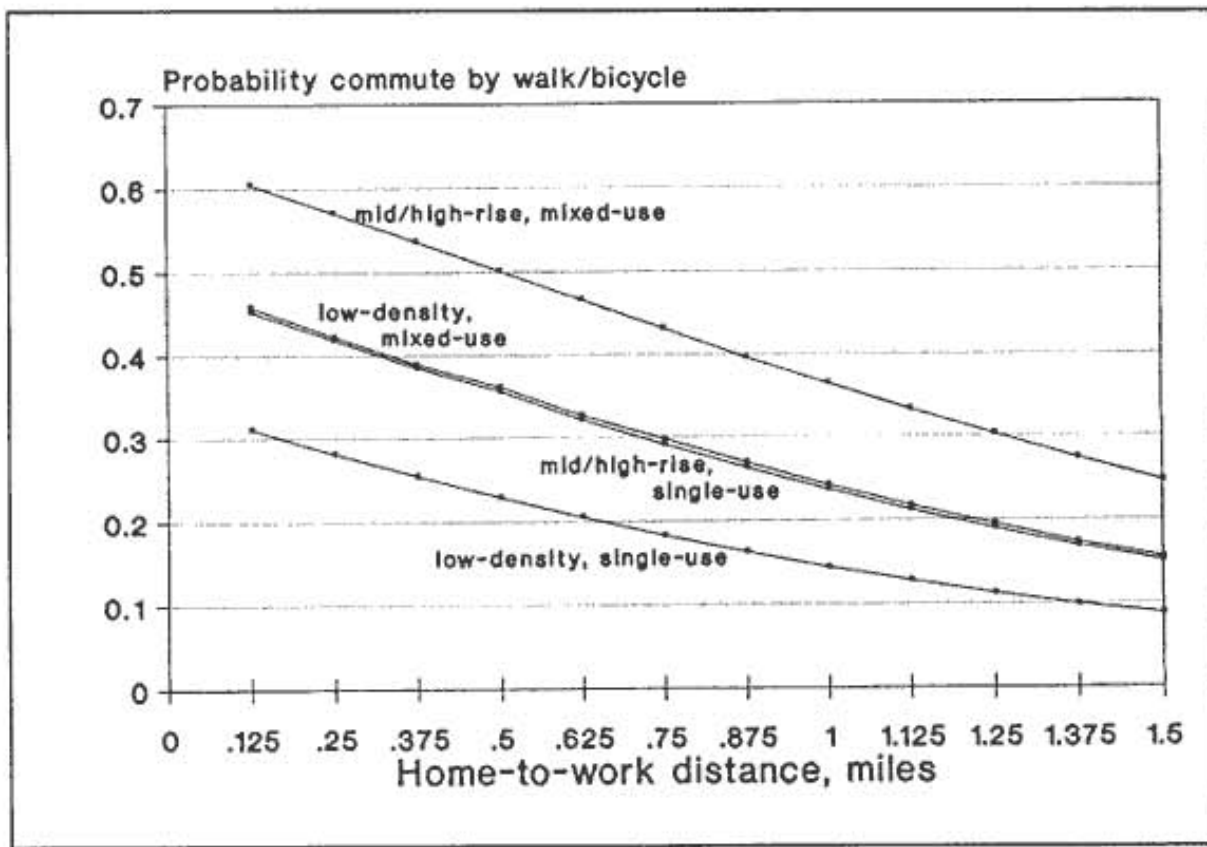
Land use diversity has also been found to have a significant effect on travel mode relative to centers. Land use diversity includes two aspects, the mix of residential and commercial uses and the balance between housing and employment. The mix of housing and retail uses are more predictive of non-work travel behavior while the mix of housing and employment is more strongly linked to commute travel behavior. (Bernick 1997)

In residential areas, mixed uses are associated with increased pedestrian traffic. Where retail uses are found near transit stops, transit mode split increases. (TCRP 1996.) In the latter case, land use mix is more strongly associated with alternative modes in non-commute trips, but has been found to impact transit commute trips accessed by foot, as well. Comparison of traditional and suburban neighborhoods revealed that high densities and mixed uses combined dramatically affected mode choices. (Fehr and Peers 1992.)

A 1992 study conducted in the San Francisco Bay Area examined the implications of retail and other mixed uses in largely residential neighborhoods. In comparing residents' shopping trips from four neighborhoods, the study found that residents in traditional mixed use neighborhoods made two to four more walk/bicycle trips per week to shop than did those living in nearby areas that were served by auto-oriented strip retail development. (Handy 1992, as noted in Cervero 1997).

The relative effects of density and land use mix are often difficult to separate, again because they are often found together. VMT was found to be significantly lower in mixed use, denser communities when compared with suburban communities (Holtzclaw 1994, as noted in Cervero 1996). A study based on 1985 travel data from 11 metropolitan areas modeled the probability of walking or bicycling to work based on degree of density and diversity. Figure 3 plots the findings. When a mix of uses combined with increasing density, the probability for commuting by walking or bicycling increased in total. (Bernick 1997)

Figure 3: Probability of Commuting by Walking or Bicycling for Four Land Use Scenarios as a Function of Commute Distance (Source: Cervero 1997)



In employment centers the integration of retail land uses reduce the auto mode share and increase the transit mode share, assuming adequate transit access. One study found that inclusion of housing in the land use mix of suburban activity centers increased alternative mode use 3% to 5% on average for work trips. (FTA 1993)

The second aspect of land use diversity is the balancing of jobs and housing. An imbalance of jobs and housing is viewed by many as a principal cause of congestion. Basically, when people live far from their jobs, commutes are longer and more trips are forced onto regional trafficways. Commonly recognized causes of this imbalance are that market forces rather than land-use policy have traditionally guided regional growth and that zoning has typically limited housing supplies near commercial and industrial developments and driven up house prices, creating a mismatch between wages in a given employment center and nearby housing (Cervero 1989).

The factors that influence where households choose to locate are currently a source of debate. Traditional residential location models predict that households make trade-offs between transportation costs and housing costs when choosing a new residential location. In other words, when housing costs are high near their place of employment, they will locate further and further out (increasing their transportation costs) until an acceptable balance between housing costs and transportation costs is achieved (Bernick 1997, Cervero 1989, Levine 1998).

Recently, researchers have been arguing that other factors, outside of market forces, are having a greater influence on residential choice. These other factors include, for example, neighborhood quality, quality of

schools, racial and ethnic mix, and access to stores and other local amenities. (Giuliano 1991) There are a number of reasons for this shift. First, transportation improvements and changes in metropolitan structure have made commuting costs much smaller now than in the past. Second, the number of dual-worker households has grown dramatically, making residential choice based on job location much more complicated. Finally, increasing job turnover rates and the expense and hassle of buying a new home are making it less practical for households to move in response to job location. (Cervero 1989) Since residential location choices now appear to depend on much more than just access to work, achieving a jobs-housing balance cannot be left solely to market forces.

Utilizing land-use policy to provide workers with diverse and affordable housing options near their jobs could greatly improve the jobs-housing balance. Potentially, this balance may reduce congestion, vehicle miles traveled and air pollution, although these effects have not been widely researched and are not commonly accepted (Crane 1996; Giuliano 1991). The more widely accepted potential for jobs-housing balance is in providing residents with choices; 'the relaxation of controls on suburban residential land use to allow greater jobs housing balance is important not so much for the potential to reduce congestion, as for the potential to increase choice' (Levine 1998). Basically, those who wish to live near work should have the opportunity to do so and should be able to choose from a range of housing costs and neighborhood characteristics. As stated by Giuliano (1991),

'Jobs-housing balance policy also reflects more general concerns about developing and maintaining communities with an adequate variety of employment and a housing mix affordable to a wide range of income levels.'

3. Urban Design

The available empirical research on the effect of urban design variables on travel behavior is limited. Individual urban design characteristics, generally, have not been directly associated with travel mode choices due to the inability to isolate the unique aspects of design. Transit and pedestrian-friendly design is often found in dense, diverse developments, in which their marginal contribution cannot easily be determined. (TCRP 1996.)

With that said, urban design characteristics are recognized as important to influencing the choice to drive or use another mode.

"The important point is that research on this question will help to show how design can provide choices to do something other than drive. This means focusing on how design provides choices and not on how design changes behavior and looking at behavior not as an end in itself, but as a measure of the quality of the environment. If people are not walking, then it suggests that the opportunity to walk is not adequate in that place: if they are not taking transit, then the opportunity is not adequate in that place. This means flipping the question around and focusing not on a change in travel behavior as an end, but focusing on providing people with the choice to do something other than drive as the end."(Handy 1997)

Urban design incorporates a number of elements including street pattern, street amenities, and site layout. Street patterns have been found to influence travel behavior. Although select studies have indicated that the increased accessibility created by traditional grid patterns may actually increase the number of trips made by reducing travel costs (Crane 1996), a wide variety of studies support the notion that grid patterns do in fact reduce vehicle miles traveled.

A study comparing a traditional grid street pattern to a cul-de-sac suburban design found that vehicle miles traveled was reduced by 43% with the grid design. (FTA 1993) Metro has found that, in addition to density and land use mix, street connectivity is a significant explanatory variable of pedestrian mode choice. Its experience is confirmed

in several simulations, which have found significant reductions in VMT in rectilinear vs. suburban neighborhoods. (TCRP 1995 and Metro 1997)

Another element of design is street amenities in the public right-of-way. Amenities can include continuous sidewalks free of obstacles such as utility poles, planter strips, signalized pedestrian/bicycle crossings, striped bicycle lanes, bicycle parking, lighting, and comfort features such as awnings, benches, landscaping and drinking fountains.

The Land Use Transportation Air Quality (LUTRAQ) considered the influence of urban design on travel behavior. The study developed a planning methodology for reducing dependence on the automobile through a combination of growth management policies, design policies, transit improvements, and travel demand management strategies. One element of the study was the development of pedestrian environment factors (PEF). The study identified a composite of four attributes influencing the choice to walk and bicycle including ease of crossings, sidewalk continuity, street connectivity, and topography. A scoring system was applied to each transportation analysis zone in the region. The analysis of the LUTRAQ simulation of the Portland suburbs revealed that in areas with high PEF scores people would make fewer automobile trips. Households would make over three times as many transit trips and four times as many walk and bicycle trips as those in areas with lower PEFs. (TCRP 1995.)

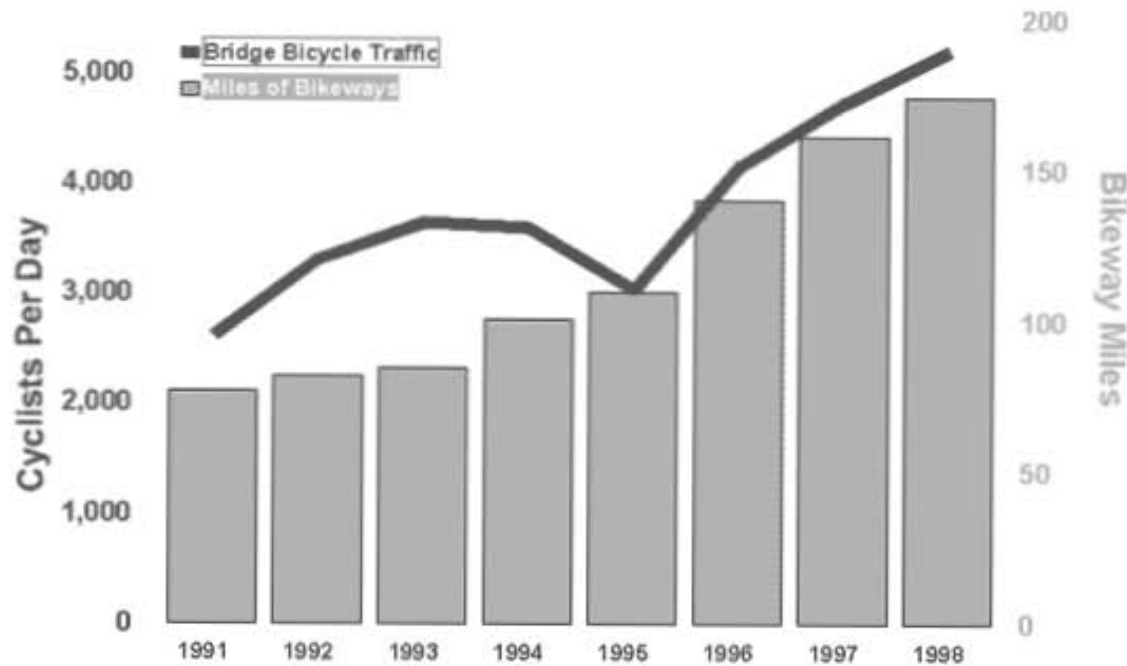
Index measures such as PEF, or dummy variables, such as a comparison of traditional neighborhoods vs. newer neighborhoods, have shown the importance of urban design, but do not provide guidance with respect to individual design elements. Improvements to Metro's modeling of pedestrian mode choice reflects this shortcoming, in its replacement of the PEF with individual characteristics made available through the 1994 travel behavior survey.

Empirical data is limited as to whether the presence of sidewalks impacts mode choice. However, conventional wisdom among planning and design professionals concludes that the presence of sidewalks positively impacts the choice to walk. A walkable environment is key to encouraging the use of alternative modes. For example, a continuous sidewalks network provides a safe haven for pedestrians. Sidewalks along roadways decrease pedestrian-vehicle accidents by as much as 35%. (Untermann 1984)

Public policy supports the inclusion of sidewalks as part of street design. The Oregon Bicycle and Pedestrian Plan calls for "bikeway and walkway systems that are integrated with other transportation systems" and for creating "a safe, convenient, and attractive bicycling and walking environment". Oregon's Transportation Planning Rule requires the inclusion of sidewalks on most streets and the City of Portland's Transportation Element identifies a pedestrian street classification hierarchy and defines policies that promote the completion of the City's pedestrian network.

The availability of empirical data for providing bicycle lanes is greater than for sidewalks. A 1993 study by the Federal Transit Administration reports that "cities with higher levels of bicycle commuting have on average 70% more bikeways per roadway mile and six times more bike lanes per roadway mile". (FTA 1998) The City of Portland's Bicycle Program found that as the City's bikeway network grew so did the daily ridership. Between 1991 and 1998, Portland's bikeway network increased by 126%. During the same period, the number of riders daily crossing the three main bicycle bridges increased by 99%. This increase was particularly noticeable on the Broadway Bridge, where daily ridership counts jumped from 495 in 1991 to 1,854 in 1998. In the same time frame, the street network accessing the Broadway Bridge went from having no bicycle facilities to having striped lanes on most major arterials.

Figure 4: Combined Bicycle Traffic Across Three Main Portland Bridges Juxtaposed with Bikeway Miles (Source: City of Portland, Office of Transportation 1998)



Site design is yet another element of urban design. Again, there is little empirical data that by itself supports the use of individual design techniques. Many of the design factors consistently

Identified by proponents of the new-old development style, referred to in a variety of terms including neo-traditional, transit-oriented, pedestrian-friendly, are found in dense, mixed use areas prone to more frequent use of alternative modes of travel. These factors include smaller lots, building entrances oriented to the street with little or no setback from the sidewalk, clear pedestrian connections to the building entrance, and parking tucked behind the building.

Public land use and transportation policies encourage the inclusion of these design elements in new development. For example, Oregon's Transportation Planning Rule requires local jurisdictions to adopt transit-supportive design standards such as orientating builds to transit, providing pedestrian connections, and adding amenities such as a pedestrian plaza. The City of Portland Zoning Code requires alternative mode-friendly design for areas of the City designated for higher density, mixed use activities. The Community Design Guidelines serves as a reference for developers on Portland's desired urban design characteristics, adopting the transit-pedestrian friendly design standards.

4. Transit Access and Service

"Transit systems can only be successful and self-sustaining if most people live, work, and shop near a transit stop. When people cannot easily walk to and from the transit stop, they are unlikely to use the system." (Local Government Commission 1992)

Transit and urban form are inextricably tied. The availability and quality of transit service rises and falls on the character of the built form. National studies have found that dense, mixed-use urban areas have higher transit ridership. Portland region's experience is an example. Areas such as inner Southeast Portland exhibit strong

transit ridership. Multiple transit lines serve the area, buses come every 15 minutes in the off-peak, and average service hours are 20 per day. The area is characterized by a grid street pattern, small lots, mixed of housing types and commercial uses. Inversely areas such as Tigard, a growing cul-de-sac suburb, where coverage is limited, buses run less frequently, and service is on average only 16 hours per day - ridership is comparatively low.

The Primary Transit Network project identified 15-minute intervals as the minimum level of service needed to justify transit-oriented development and transit-supportive street design.

"If transit runs every 15 minutes or better, wait times are short enough that the system can be used spontaneously. Passengers can simply wait at a stop without worrying about whether schedules are coordinated or the bus is on time. ...Very frequent transit service provides basic freedoms that people associate with driving, such as the ability to make trips spontaneously or to make multiple stops in the course of a trip." (Nelson\Nygaard 1995)

Accessibility to transit is an important factor to usage. Is transit service within a comfortable walking distance and does it connect to activity centers? The acceptable walking distance has generally been found to be about .25 of a mile to transit, although research has shown that people will walk further for higher-quality rail service. A study of walking in Calgary found that the average walking distance to bus stops is a little less than a quarter mile. The quality and frequency of transit service also impacts the choice to take transit. If service is reliable and frequent, people will tend to walk further to use transit. (O'Sullivan and Morrall 1995)

5. Parking

Parking policies are the key determinant of the cost and convenience of automobile commuting. Pricing and subsidy levels significantly impact mode choice. Additionally, zoning and lending requirements often required developers to provide more parking than average demand requires. The cumulative result of these policies is to create an oversupply of parking, which encourages auto use and an auto-oriented urban form.

Availability of ample, free parking has been identified as a significant variable in several studies regarding commuting patterns to central business districts and suburban activity centers. (Willson 1992) Researchers note that automobile dominance of these centers is a function of several characteristics, including ample, often free parking; infrequent transit service; and relatively homogeneous land uses. (Calthorpe 1996, Cervero 1989.) A comparison of seven studies on the impacts of employer-paid parking on travel behavior found the incidence of single-occupancy commute trips drops by 25% when drivers pay for their parking. (Shoup 1995) Among workers, bus mode share is related to parking costs, access to downtown, and overall density. (Ewing 1996.)

A national survey of data on parking demand and supply found, in general, an oversupply of parking in suburban America.

"The average peak demand for private offices ranges between 2.5 and 2.8 parking spaces per 1,000 gross square feet [of floor space], while Cervero reports an average supply of 3.9 spaces per square foot. This represents almost 50% more parking than is demanded."
" (Willson 1992)

Further evidence of the imbalance of supply to demand comes from studies of suburban office parks. One study found a 47% parking occupancy for a well-leased office park. (Gruen Gruen and Associates 1986, as mentioned in Wilson). Cervero studied nine office parks in suburban Philadelphia, finding that only 61% of spaces were occupied during the peak demand. (Cervero 1989)

6. Transportation Demand Management

The use of transportation demand management (TDM) strategies is growing in popularity as a means of reducing reliance of the automobile. Both the public and private sector play a role in the implementation of TDM. On the public side, many jurisdictions are developing comprehensive transportation demand management programs to help reduce auto use. Strategies include transit expansion, parking regulations, and employer requirements to develop internal TDM programs. For example, the Oregon Department of Environmental Quality established the "eco-rule" requiring companies with over 50 employees to develop and implement a TDM program. A similar measure was passed in Southern California during the late 1980s. Goal 6 of the City of Portland's Comprehensive Plan requires the use of TDM strategies to "mitigate the impact of development-generated traffic in land use reviews."

Among all travel demand management strategies, financial incentives had the greatest effect on shifts in mode choice. In addition, however, "TDM strategies have a lot larger influence on reducing the drive-alone mode share than do most land use characteristics, when each is considered individually." This implies that the land use environment only matters at the work end of the trip when combined with aggressive TDM initiatives. (TCRP 1996, citing Cambridge Systematics 1994.)

7. Demographic Factors

Understanding the character of households provides clues about choices people will make regarding their mobility. As the demographic characteristics of a household change – marriage status, employment status, children, auto ownership– travel behavior will change. For example, households without autos make less than one-quarter the daily number of trips of households reporting that they have cars. (Twin Cities Metropolitan Council 1994)

Certain demographic factors are especially predictive and are commonly used when modeling travel behavior. Household income, household size, age distribution in household, and auto ownership are some of the standard inputs into models. Metro's travel forecast model employs these factors.

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Other Community Descriptor Projects - Printable Version

Numerous communities are turning to descriptor (indicators) to measure progress towards community goals. The bulk of these projects seek to measure quality of life in the community, capturing data on a variety of areas. For example, Pierce County in Washington has embarked on a project called "Quality of Life Benchmarks". The project is tracking 80 indicators of "livability" ranging from housing to energy consumption to education. The state of Oregon also embarked on its own indicator project with "Oregon Benchmarks" in 1995.

While these measures provide some insight as to possible measures, the focus of the Centers project is narrower. The descriptors will track progress towards meeting the centers' mode split targets over time.

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Preliminary Descriptors - Printable Version

Following are the key descriptors that will be used in the Centers Project; a brief discussion of how they were selected; and the method for calculation.

Density

The research findings support using density as a key descriptor. The standard measure of density is units per acre. The density calculation for the centers project uses net density, subtracting out streets. The density descriptor will quantify both residential and employment density.

- Single Family Units/ Net Acre
- Multi Family Units/Net Acre
- Total Residential Units/Net Acre
- Total Employment/Net Acre

Diversity

In capturing the diversity of an area, two different descriptors developed under previous TGM grants will be used.

The first descriptor is adapted from the *Accessibility Measure/Transportation Impact Factor Study*. Called the "proximity measure", it captures both the diversity of uses in an area and the accessibility between residential and commercial or recreational uses. It is calculated by finding the percentage of households within walking distance (defined as ¼ mile) to neighborhood destinations such as shopping, parks, community meeting places like schools, libraries, recreation centers, and transit. To accommodate the parameters of this study, modifications have been made to the original work.

Town centers are mixed-use areas with a commercial district easily accessed by denser residential uses in and around the core. They are well served by transit and provide recreational opportunities to the surrounding neighborhoods. The calculation essentially follows the original methodology.

Town center proximity descriptors include:

- Percentage of households within the study area that are within ¼ mile of commercial establishments located in

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the center. (The commercial establishments are divided into six pedestrian-oriented commercial establishments including Food Market, Drug Store, Restaurant/Café, Personal Services, Retail Goods, and Medical/Dental Services)

- Percentage of households within the study area that are within ¼ mile of a transit stop.
- Percentage of households within the study area that are within ¼ mile of a park.
- Percentage of households within the study area that are within ¼ mile of a community center/library.
- Percentage of households within the study area that are within ¼ mile of a school.

For 2040 station communities, the emphasis is on access from the station to housing, commercial uses, parks etc. The descriptor calculation has been adjusted recognizing the primacy of the transit station as the key attractor in station communities and the desire to measure access and diversity to and within close proximity to the station.

Station Community proximity measure descriptors include:

- Number of households a within ¼ mile of the transit station.
- Number of pedestrian-oriented commercial establishments within a ¼ mile of the transit station.
- Number of parks within ¼ mile of the transit station.
- Number of community centers/libraries within ¼ mile of the transit station.
- Number of schools within ¼ mile of the transit station.

The second measure is the Mixed-Use factor used in the City of Portland's Pedestrian Master Plan, a TGM funded project. The factor is also used in Metro's travel forecast model to predict the quality of the pedestrian environment. The measure was originally used to measure the pedestrian potential of an area. The factor is a combination variable capturing the mixed use and density of a given area. Developed by Metro, this variable shows a strong correlation with the choice to walk. The factor is calculated as follows:

- Mixed Use Factor = $ED * HD / (ED + HD)$

ED represents the normalized employment density within the study area and HD represents the normalized household density within the study area. In area where there is high density and a balance of residential to employment, the factor will be high. For example, a zone where ED = 100 and HD = 100 would result in a higher value than ED = 50 and HD = 200 (technically more dense) because the former combination exhibits a better mix of use in addition to density.

Urban Design

Although empirical studies supporting the use of urban design factors as descriptors are limited, public policies at the state, regional, and local levels justify the measurement of certain design elements. There are four descriptor types for urban design.

1. Intersection Density (consistent with Metro's travel forecast model factor)

- Intersections/linear mile

2. Presence of Sidewalks

- Percentage of street segments with a complete sidewalk.

3. Bicycle Network.

- Percentage of street miles designated as bicycle routes.

4. Design Evaluation of Commercial Structures

(measures extent to which commercial structures within a study area comply with the desired building orientation, setbacks, and location of parking as defined by state, regional, and local land use policy)

Criteria:

1. Setback < 25'
 2. No Parking Between street and building
 3. Main Entrance Orientation to street
- Percentage of commercial structures meeting three criteria.
 - Percentage of commercial structures meeting two criteria.
 - Percentage of commercial structures meeting one criterion.
 - Percentage of commercial structures meeting zero criteria.

Transit Service

The descriptors for measuring the quality of transit service for each study area is as follows:

- Number of lines serving the area
- Peak Hour Headways by line
- Mid-day Headways by line
- Number of service hours by line

Transportation Demand Management

The presence of transportation demand management programs has been linked to increases in the use of alternative modes. Businesses and institutions subject to required TDM programs under Eco-rule are a good indicator of potential for non-SOV travel in a study area. Following is the descriptor for TDM:

- Number of employers subject to Eco-rule requirements

Parking

Research has shown that the two key parking factors that most influence travel behavior are the cost of parking and the supply of parking. With regard to the parking cost, Metro's travel forecast model assumes a parking cost factor. The calculation for parking supply focuses on the commercial uses within a study area. A high ratio of parking to building square footage, in conjunction with other descriptors, indicates an area supportive of auto-oriented uses. This will be an important measure of trends in parking supply in light of the regional push for a new minimum and maximum parking requirements particularly in 2040 centers.

Parking descriptors include:

- Average cost of parking per hour
- Off street parking spaces/1000 square feet of commercial use.

Demographics

The demographic descriptors correspond with Metro's travel forecast model and have been shown to be a significant measure of mode choice.

Demographic descriptors include:

- Household size distribution
- Household income distribution
- Household age distribution
- Vehicle Ownership distribution

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As the research shows, no one descriptor can tell the whole story. Each exerts an influence on travel behavior that when considered together will provide a more complete understanding of how and why travel choices are made in a study area. Table 1 provides a complete list of descriptors by category.

As the Centers projects moves forward, the next steps include applying the descriptors to the different study areas and analyzing the findings against Metro's travel forecast data.

Table 1: Centers Descriptors

Category	Descriptor
Density	• Single Family Units/ Net Acre • Multi Family Units/Net Acre • Total Residential Units/Net Acre • Total Employment/Net Acre
Diversity	• Mixed Use Factor = $ED * HD / ED + HD$

Town Centers

- Percentage of households within the study area that are within ¼ mile of commercial establishments located in the center.
- Percentage of households within the study area that are within ¼ mile of a transit stop
- Percentage of households within the study area that are within ¼ mile of a park.
- Percentage of households within the study area that are within ¼ mile of a community center/library.
- Percentage of households within the study area that are within ¼ mile of a school.

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	<i>Station Communities</i> • Number of households a within ¼ mile of the transit station. • Number of pedestrian-oriented commercial establishments within a ¼ mile of the transit station. • Number of parks within ¼ mile of the transit station. • Number of community centers/libraries within ¼ mile of the transit station. • Number of schools within ¼ mile of the transit station.
Design	• Intersections/linear mile • Percentage of street segments with a complete sidewalk • Percentage of street miles designated as bicycle routes. • Percentage of commercial structures meeting three criteria. • Percentage of commercial structures meeting two criteria. • Percentage of commercial structures meeting one criterion. • Percentage of commercial structures meeting zero criteria. Criteria: 1. Setback < 25' 2. No Parking Between street and building 3. Main Entrance Orientation to street
Transit Service	• Number of lines serving the area • Peak Hour Headways by line • Mid-day Headways by line • Number of service hours by line
TDM	• Number of employers subject to Eco-rule requirements
Parking	• Average cost of parking per hour • Off street parking spaces/1000 square feet of commercial use.
Demographics	• Household size distribution • Household income distribution • Number of Workers in Household distribution • Vehicle Ownership distribution

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→ **Appendix D Economic Development Allocation Analysis**

Allocations 122nd Station Community - Printable Version

**E. D. Hovee
& Company**
Economic and Development Services

Memorandum

To: Deena Platman, Portland Department of Transportation
From: Denise Whitney, Project Economist
Subject: 2040 Centers TGM Project: 122nd Avenue Light Rail Station Area Allocations
Date: June 30, 1999

Introduction

The following memorandum provides the methodology and results of an economic development allocation analysis for the 122nd Avenue Light Rail Station Area. The purpose of this analysis is to provide a build-out estimate of future employment and housing for the study area as part of the 2040 Centers TGM project.

Qualifications & Limitations

The economic development allocation analysis was prepared for the City of Portland Department of Transportation by the economic and development consulting firm E.D. Hovee & Company as part of the 2040 Centers TGM project.

Observations and findings are those of E.D. Hovee & Company and should not be construed as representing the opinion of any other party without that party's express endorsement, whether in whole or in part.

Organization of Memorandum

The remainder of this memorandum is organized to cover the following topics:

- Analysis Methodology
 - Description of Results

**Allocations 122nd Station
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**Allocations Hillsdale Town
Center**

**Allocations St. Johns Town
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**Allocations West Portland
Town Center**

**Allocations 60th Station
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**Allocations 82nd Station
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**Allocations 148th Station
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Analysis Methodology

This economic development analysis is based on a review of the Portland Comprehensive Plan and Portland Zoning Code and relies on data provided by the Portland Department of Transportation including:

- Vacant lands inventory by parcel
- Redevelopment parcels inventory (identified as parcels where land value + improvement value/land square foot is equal to or less than \$10.00)
- Contiguous ownership inventory
- Zoning by parcel

The build-out allocation identifies long-term development capacity for the study area given comprehensive plan zoning and a 10% market factor assuming:

- Infill of existing vacant single family zoned parcels.
- Multi-family development on appropriately zoned vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more at densities consistent with zoning minimums.
- Commercial land development allocated 90% to commercial and 10% to residential use. The amount of commercial development generated by added households is also noted.
 - Industrial land development on vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more.

The chart on the following page provides a detailed listing of key development assumptions.

Key Development Assumptions

Assumption Category	Factor
Maximum redevelopment land + improvement value per SF of land*	\$10.00
Market Factor	10%
% of commercial zoning to residential use	10%
% of employment zoning (EG) to residential use	0%
% of employment zoning (EX) to residential use	75%

% of industrial zoning to residential use	0%
% of institutional zoning to residential use	case-by-case
% of residential zoning to residential use	100%
% of industrial zoning to commercial use	0%
% of employment zoning (EX) to commercial use	25%
Land area (SF) per housing unit in R1 zoning	2,000
Land area (SF) per housing unit in R2 zoning	2,000
Land area (SF) per housing unit in R2.5 zoning	2,500
Land area (SF) per housing unit in R3 zoning	3,000
Land area (SF) per housing unit in R5 zoning	5,000
Land area (SF) per housing unit in R7 zoning	7,000
Land area (SF) per housing unit in R10 zoning	10,000
Land area (SF) per housing unit in RH zoning* *	2,000
Land area (SF) per housing unit in commercial zoning	2,000
Land area (SF) per housing unit in institutional zoning	2,000

Land area (SF) per housing unit in EX zoning	2,000
Maximum FAR for CG zoning	3.00
Maximum FAR for CM zoning	1.00
Maximum FAR for CN zoning	0.75
Maximum FAR for CS zoning	3.00
Maximum FAR for CX zoning	4.00
Maximum FAR for CO zoning	2.00
Maximum FAR for EX zoning	3.00
Maximum FAR for EG zoning	3.00
Maximum FAR for IG1 zoning	0.50
Maximum FAR for IH zoning	0.50
Maximum FAR for IR zoning	2.00
Commercial building SF per employee	500
Commercial office building SF per employee	250
Institutional building SF per employee	1,500
Industrial building SF per employee	750
Demand for commercial space per new housing unit***	50

Note: * Applied to individual parcels and combined value of contiguous parcel groups of 10,000 square feet or more under common ownership.

** Requires a revision to RH zoning (current minimum is 1,000 SF/unit).

*** Occupied retail space per household for the four-county region as of 1997 (Grubb & Ellis and Metro data).

Description of Results

Results of applying the methodology and assumptions described previously are summarized below in tabular and narrative form.

It is important to note that calculations of added building space, jobs, and housing are presented in gross rather than net terms. These allocations reflect new construction only and do not account for potential losses that could result from redevelopment of parcels that have existing residential, commercial, and/or industrial uses. Determination of potential displacement is beyond the scope of this analysis.

Developable Land in Acres

Use	Developable	Allocated*
Residential	28.0	25.3
Other	13.4	12.0
Total	41.4	37.3

*Note: Reduced by market factor of 10%.

Added Commercial/ Industrial Building Space

Use	Building Space (SF)
Retail	1,167,900
Office	164,200
Industrial	0
Total	1,332,100

- The majority of the 41.4 acres of developable land within the 122nd Light Rail Station Area is zoned for residential use. In addition, 10% of the developable commercial land was also allocated to residential development.
- Build-out of developable commercial lands at maximum allowable floor area ratios (FAR) results in nearly 1.17 million square feet of added retail space and 164,200 square feet of added commercial office space. However, added households generate demand for only about 27,000 square feet of additional retail space. There are no developable parcels zoned for industrial development in the study area.
- Build-out of developable commercial lands would provide approximately 2,336 additional retail and 657 non-retail jobs within the study area.
- Appropriately zoned vacant and redevelopable land could accommodate 15 single family and 525 multi-family housing units. These added units are estimated at an average density of 21.4 units per net acre.

Added Jobs

Use	Jobs
Retail	2,336
Other	657

Total	2,993
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Added Housing

Type	Units
Single Family	15
Multi-Family	525
Total	540
Average New Unit Density	21.4

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Allocations Hillsdale Town Center - Printable Version

**E. D. Hovee
& Company**
Economic and Development Services

Memorandum

To: Deena Platman, Portland Department of Transportation
From: Denise Whitney, Project Economist
Subject: 2040 Centers TGM Project: Hillsdale Town Center Allocations
Date: June 30, 1999

Introduction

The following memorandum provides the methodology and results of an economic development allocation analysis for the Hillsdale Town Center. The purpose of this analysis is to provide a build-out estimate of future employment and housing for the study area as part of the 2040 Centers TGM project.

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This economic development analysis is based on a review of the Portland Comprehensive Plan and Portland Zoning Code and relies on data provided by the Portland Department of Transportation including:

- Vacant lands inventory by parcel
- Redevelopment parcels inventory (identified as parcels where land value + improvement value/land square foot is equal to or less than \$10.00)
- Contiguous ownership inventory
- Zoning by parcel

The build-out allocation identifies long-term development capacity for the study area given comprehensive plan zoning and a 10% market factor assuming:

- Infill of existing vacant single family zoned parcels.
- Multi-family development on appropriately zoned vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more at densities consistent with zoning minimums.
- Commercial land development allocated 90% to commercial and 10% to residential use. The amount of commercial development generated by added households is also noted.
- Industrial land development on vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more.

The chart on the following page provides a detailed listing of key development assumptions.

Key Development Assumptions

Assumption Category	Factor
Maximum redevelopment land + improvement value per SF of land*	\$10.00
Market Factor	10%
% of commercial zoning to residential use	10%
% of employment zoning (EG) to residential use	0%
% of employment zoning (EX) to residential use	75%
% of industrial zoning to residential use	0%

% of institutional zoning to residential use	case-by-case
% of residential zoning to residential use	100%
% of industrial zoning to commercial use	0%
% of employment zoning (EX) to commercial use	25%
Land area (SF) per housing unit in R1 zoning	2,000
Land area (SF) per housing unit in R2 zoning	2,000
Land area (SF) per housing unit in R2.5 zoning	2,500
Land area (SF) per housing unit in R3 zoning	3,000
Land area (SF) per housing unit in R5 zoning	5,000
Land area (SF) per housing unit in R7 zoning	7,000
Land area (SF) per housing unit in R10 zoning	10,000
Land area (SF) per housing unit in RH zoning* *	2,000
Land area (SF) per housing unit in commercial zoning	2,000
Land area (SF) per housing unit in institutional zoning	2,000
Land area (SF) per housing unit in EX zoning	2,000

Maximum FAR for CG zoning	3.00
Maximum FAR for CM zoning	1.00
Maximum FAR for CN zoning	0.75
Maximum FAR for CS zoning	3.00
Maximum FAR for CX zoning	4.00
Maximum FAR for CO zoning	2.00
Maximum FAR for EX zoning	3.00
Maximum FAR for EG zoning	3.00
Maximum FAR for IG1 zoning	0.50
Maximum FAR for IH zoning	0.50
Maximum FAR for IR zoning	2.00
Commercial building SF per employee	500
Commercial office building SF per employee	250
Institutional building SF per employee	1,500
Industrial building SF per employee	750
Demand for commercial space per new housing unit***	50

Note: * Applied to individual parcels and combined value of contiguous parcel groups of 10,000 square feet or more under common ownership.

** Requires a revision to RH zoning (current minimum is 1,000 SF/unit).

*** Occupied retail space per household for the four-county region as of 1997 (Grubb & Ellis and Metro data).

Description of Results

Results of applying the methodology and assumptions described previously are summarized below in tabular and narrative form.

It is important to note that calculations of added building space, jobs, and housing are presented in gross rather than net terms. These allocations reflect new construction only and do not account for potential losses that could result from redevelopment of parcels that have existing residential, commercial, and/or industrial uses. Determination of potential displacement is beyond the scope of this analysis.

Developable Land in Acres

Use	Developable	Allocated*
Residential	13.7	12.3
Other	9.2	8.3
Total	22.9	20.6

*Note: Reduced by market factor of 10%.

Added Commercial/ Industrial Building Space

Use	Building Space (SF)
Retail	921,500
Office	0
Industrial	0
Total	921,500

- The majority of the 22.9 acres of developable land within the Hillsdale Town Center is zoned for residential use. In addition, 10% of the developable commercial land was also allocated to residential development.
- Build-out of developable commercial lands at maximum allowable floor area ratios (FAR) results in 921,500 of added retail space. However, added households generate demand for only about 11,600 square feet of additional retail space. There are no developable parcels zoned for commercial office or industrial development in the study area.
- Build-out of developable commercial lands could provide approximately 1,843 additional retail jobs within the study area.

Appropriately zoned vacant and redevelopable land could accommodate 21 single family and 211 multi-family housing units. These added units are estimated at an average density of 18.8 units per net acre.

Added Jobs

Use	Jobs
Retail	1,843
Other	0
Total	1,843

Added Housing

Type	Units
Single Family	21
Multi-Family	211
Total	232
Average New Unit Density	18.8

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→ **Appendix D Economic Development Allocation Analysis**

Allocations St. Johns Town Center - Printable Version

**E. D. Hovee
& Company**
Economic and Development Services

Memorandum

To: Deena Platman, Portland Department of Transportation
From: Denise Whitney, Project Economist
Subject: 2040 Centers TGM Project: St. Johns Town Center Allocations
Date: June 30, 1999

Introduction

The following memorandum provides the methodology and results of an economic development allocation analysis for the St. Johns Town Center. The purpose of this analysis is to provide a build-out estimate of future employment and housing for the study area as part of the 2040 Centers TGM project.

Qualifications & Limitations

The economic development allocation analysis was prepared for the City of Portland Department of Transportation by the economic and development consulting firm E.D. Hovee & Company as part of the 2040 Centers TGM project.

Observations and findings are those of E.D. Hovee & Company and should not be construed as representing the opinion of any other party without that party's express endorsement, whether in whole or in part.

Organization of Memorandum

The remainder of this memorandum is organized to cover the following topics:

- Analysis Methodology
 - Description of Results

**Allocations 122nd Station
Community**

**Allocations Hillsdale Town
Center**

**Allocations St. Johns Town
Center**

**Allocations West Portland
Town Center**

**Allocations 60th Station
Community**

**Allocations 82nd Station
Community**

**Allocations 148th Station
Community**

If you have any questions or
comments on our site, please
contact our site administrator.

Analysis Methodology

This economic development analysis is based on a review of the Portland Comprehensive Plan and Portland Zoning Code and relies on data provided by the Portland Department of Transportation including:

- Vacant lands inventory by parcel
- Redevelopment parcels inventory (identified as parcels where land value + improvement value/land square foot is equal to or less than \$10.00)
- Contiguous ownership inventory
- Zoning by parcel

The build-out allocation identifies long-term development capacity for the study area given comprehensive plan zoning and a 10% market factor assuming:

- Infill of existing vacant single family zoned parcels.
- Multi-family development on appropriately zoned vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more at densities consistent with zoning minimums.
- Commercial land development allocated 90% to commercial and 10% to residential use. The amount of commercial development generated by added households is also noted.
- Industrial land development on vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more.

The chart on the following page provides a detailed listing of key development assumptions.

Key Development Assumptions

Assumption Category	Factor
Maximum redevelopment land + improvement value per SF of land*	\$10.00
Market Factor	10%
% of commercial zoning to residential use	10%
% of employment zoning (EG) to residential use	0%
% of employment zoning (EX) to residential use	75%
% of industrial zoning to residential use	0%

% of institutional zoning to residential use	case-by-case
% of residential zoning to residential use	100%
% of industrial zoning to commercial use	0%
% of employment zoning (EX) to commercial use	25%
Land area (SF) per housing unit in R1 zoning	2,000
Land area (SF) per housing unit in R2 zoning	2,000
Land area (SF) per housing unit in R2.5 zoning	2,500
Land area (SF) per housing unit in R3 zoning	3,000
Land area (SF) per housing unit in R5 zoning	5,000
Land area (SF) per housing unit in R7 zoning	7,000
Land area (SF) per housing unit in R10 zoning	10,000
Land area (SF) per housing unit in RH zoning* *	2,000
Land area (SF) per housing unit in commercial zoning	2,000
Land area (SF) per housing unit in institutional zoning	2,000
Land area (SF) per housing unit in EX zoning	2,000

Maximum FAR for CG zoning	3.00
Maximum FAR for CM zoning	1.00
Maximum FAR for CN zoning	0.75
Maximum FAR for CS zoning	3.00
Maximum FAR for CX zoning	4.00
Maximum FAR for CO zoning	2.00
Maximum FAR for EX zoning	3.00
Maximum FAR for EG zoning	3.00
Maximum FAR for IG1 zoning	0.50
Maximum FAR for IH zoning	0.50
Maximum FAR for IR zoning	2.00
Commercial building SF per employee	500
Commercial office building SF per employee	250
Institutional building SF per employee	1,500
Industrial building SF per employee	750
Demand for commercial space per new housing unit***	50

Note: * Applied to individual parcels and combined value of contiguous parcel groups of 10,000 square feet or more under common ownership.

** Requires a revision to RH zoning (current minimum is 1,000 SF/unit).

*** Occupied retail space per household for the four-county region as of 1997 (Grubb & Ellis and Metro data).

Description of Results

Results of applying the methodology and assumptions described previously are summarized below in tabular and narrative form.

It is important to note that calculations of added building space, jobs, and housing are presented in gross rather than net terms. These allocations reflect new construction only and do not account for potential losses that could result from redevelopment of parcels that have existing residential, commercial, and/or industrial uses. Determination of potential displacement is beyond the scope of this analysis.

Developable Land in Acres

Use	Developable	Allocated*
Residential	9.0	8.1
Other	49.1	44.2
Total	58.1	52.3

*Note: Reduced by market factor of 10%.

Added Commercial/ Industrial Building Space

Use	Building Space (SF)
Retail	646,100
Office	0
Industrial	4,407,500
Total	5,053,600

- The majority of the 58.1 acres of developable land within the St. Johns Town Center is zoned for employment (EG2).
- Build-out of developable commercial and industrial lands at maximum allowable floor area ratios (FAR) results in 646,100 square feet of added retail space and over 4.4 million square feet of added industrial space (assuming all EG2 zoned land develops to industrial uses). Added households generate demand for only about 8,800 square feet of additional retail space. There are no developable parcels zoned for commercial office development in the study area.
- Build-out of developable commercial and industrial lands could provide approximately 1,292 additional retail and 5,876 industrial jobs within the study area.
- Appropriately zoned vacant and redevelopable land could accommodate 1 single family and 174 multi-family housing units. These added units are estimated at an average density of 21.6 units per net acre.

Added Jobs

Use	Jobs
Retail	1,292
Other	5,876
Total	7,168

Added Housing

Type	Units
Single Family	1
Multi-Family	174
Total	175
Average New Unit Density	21.6

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Allocations West Portland Town Center - Printable Version

**E. D. Hovee
& Company**
Economic and Development Services

Memorandum

To: Deena Platman, Portland Department of Transportation
From: Denise Whitney, Project Economist
Subject: 2040 Centers TGM Project: West Portland Town Center Allocations
Date: June 30, 1999

Introduction

The following memorandum provides the methodology and results of an economic development allocation analysis for the West Portland Town Center. The purpose of this analysis is to provide a build-out estimate of future employment and housing for the study area as part of the 2040 Centers TGM project.

Qualifications & Limitations

The economic development allocation analysis was prepared for the City of Portland Department of Transportation by the economic and development consulting firm E.D. Hovee & Company as part of the 2040 Centers TGM project.

Observations and findings are those of E.D. Hovee & Company and should not be construed as representing the opinion of any other party without that party's express endorsement, whether in whole or in part.

Organization of Memorandum

The remainder of this memorandum is organized to cover the following topics:

- Analysis Methodology
 - Description of Results

**Allocations 122nd Station
Community**

**Allocations Hillsdale Town
Center**

**Allocations St. Johns Town
Center**

**Allocations West Portland
Town Center**

**Allocations 60th Station
Community**

**Allocations 82nd Station
Community**

**Allocations 148th Station
Community**

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comments on our site, please
contact our site administrator.

Analysis Methodology

This economic development analysis is based on a review of the Portland Comprehensive Plan and Portland Zoning Code and relies on data provided by the Portland Department of Transportation including:

- Vacant lands inventory by parcel
- Redevelopment parcels inventory (identified as parcels where land value + improvement value/land square foot is equal to or less than \$10.00)
- Contiguous ownership inventory
- Zoning by parcel

The build-out allocation identifies long-term development capacity for the study area given comprehensive plan zoning and a 10% market factor assuming:

- Infill of existing vacant single family zoned parcels.
- Multi-family development on appropriately zoned vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more at densities consistent with zoning minimums.
- Commercial land development allocated 90% to commercial and 10% to residential use. The amount of commercial development generated by added households is also noted.
- Industrial land development on vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more.

The chart on the following page provides a detailed listing of key development assumptions.

Key Development Assumptions

Assumption Category	Factor
Maximum redevelopment land + improvement value per SF of land*	\$10.00
Market Factor	10%
% of commercial zoning to residential use	10%
% of employment zoning (EG) to residential use	0%
% of employment zoning (EX) to residential use	75%
% of industrial zoning to residential use	0%

% of institutional zoning to residential use	case-by-case
% of residential zoning to residential use	100%
% of industrial zoning to commercial use	0%
% of employment zoning (EX) to commercial use	25%
Land area (SF) per housing unit in R1 zoning	2,000
Land area (SF) per housing unit in R2 zoning	2,000
Land area (SF) per housing unit in R2.5 zoning	2,500
Land area (SF) per housing unit in R3 zoning	3,000
Land area (SF) per housing unit in R5 zoning	5,000
Land area (SF) per housing unit in R7 zoning	7,000
Land area (SF) per housing unit in R10 zoning	10,000
Land area (SF) per housing unit in RH zoning* *	2,000
Land area (SF) per housing unit in commercial zoning	2,000
Land area (SF) per housing unit in institutional zoning	2,000
Land area (SF) per housing unit in EX zoning	2,000

Maximum FAR for CG zoning	3.00
Maximum FAR for CM zoning	1.00
Maximum FAR for CN zoning	0.75
Maximum FAR for CS zoning	3.00
Maximum FAR for CX zoning	4.00
Maximum FAR for CO zoning	2.00
Maximum FAR for EX zoning	3.00
Maximum FAR for EG zoning	3.00
Maximum FAR for IG1 zoning	0.50
Maximum FAR for IH zoning	0.50
Maximum FAR for IR zoning	2.00
Commercial building SF per employee	500
Commercial office building SF per employee	250
Institutional building SF per employee	1,500
Industrial building SF per employee	750
Demand for commercial space per new housing unit***	50

Note: * Applied to individual parcels and combined value of contiguous parcel groups of 10,000 square feet or more under common ownership.

** Requires a revision to RH zoning (current minimum is 1,000 SF/unit).

*** Occupied retail space per household for the four-county region as of 1997 (Grubb & Ellis and Metro data).

Description of Results

Results of applying the methodology and assumptions described previously are summarized below in tabular and narrative form.

It is important to note that calculations of added building space, jobs, and housing are presented in gross rather than net terms. These allocations reflect new construction only and do not account for potential losses that could result from redevelopment of parcels that have existing residential, commercial, and/or industrial uses. Determination of potential displacement is beyond the scope of this analysis.

Developable Land in Acres

Use	Developable	Allocated*
Residential	27.5	24.8
Other	7.2	6.5
Total	34.7	52.3

*Note: Reduced by market factor of 10%.

Added Commercial/ Industrial Building Space

Use	Building Space (SF)
Retail	802,700
Office	28,700
Industrial	0
Total	831,400

- The majority of the 34.7 acres of developable land within the West Portland Town Center is zoned residential. In addition, 10% of the developable commercial land was also allocated to residential development.
- Build-out of developable commercial lands at maximum allowable floor area ratios (FAR) results in 802,700 square feet of added retail space and 28,700 square feet of commercial office space. Added households generate demand for only about 19,600 square feet of additional retail space. There are no developable parcels zoned for industrial development in the study area.
- Build-out of developable commercial lands could provide approximately 1,292 additional retail and 5,876 industrial jobs within the study area.
- Appropriately zoned vacant and redevelopable land could accommodate 65 single family and 326 multi-family housing units. These added units are estimated at an average density of 15.8 units per net acre

Added Jobs

Use	Jobs
Retail	1,605
Other	115
Total	1,720

Added Housing

Type	Units
Single Family	65
Multi-Family	326
Total	391
Average New Unit Density	15.8

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Allocations 60th Station Community - Printable Version

**E. D. Hovee
& Company**
Economic and Development Services

Memorandum

To: Deena Platman, Portland Department of Transportation
From: Denise Whitney, Project Economist
Subject: 2040 Centers TGM Project: 60th Avenue Light Rail Station Area Allocations
Date: June 30, 1999

Introduction

The following memorandum provides the methodology and results of an economic development allocation analysis for the 60th Avenue Light Rail Station Area. The purpose of this analysis is to provide a build-out estimate of future study area employment and housing as part of the 2040 Centers TGM project.

Qualifications & Limitations

The economic development allocation analysis was prepared for the City of Portland Department of Transportation by the economic and development consulting firm E.D. Hovee & Company as part of the 2040 Centers TGM project.

Observations and findings are those of E.D. Hovee & Company and should not be construed as representing the opinion of any other party without that party's express endorsement, whether in whole or in part.

Organization of Memorandum

The remainder of this memorandum is organized to cover the following topics:

- Analysis Methodology
 - Description of Results

**Allocations 122nd Station
Community**

**Allocations Hillsdale Town
Center**

**Allocations St. Johns Town
Center**

**Allocations West Portland
Town Center**

**Allocations 60th Station
Community**

**Allocations 82nd Station
Community**

**Allocations 148th Station
Community**

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comments on our site, please
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Analysis Methodology

This economic development analysis is based on a review of the Portland Comprehensive Plan and Portland Zoning Code and relies on data provided by the Portland Department of Transportation including:

- Vacant lands inventory by parcel
- Redevelopment parcels inventory (identified as parcels where land value + improvement value/land square foot is equal to or less than \$10.00)
- Contiguous ownership inventory
- Zoning by parcel

The build-out allocation identifies long-term development capacity for the study area given comprehensive plan zoning and a 10% market factor assuming:

- Infill of existing vacant single family zoned parcels.
- Multi-family development on appropriately zoned vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more at densities consistent with zoning minimums.
- Commercial land development allocated 90% to commercial and 10% to residential use. The amount of commercial development generated by added households is also noted.
- Industrial land development on vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more.

The chart on the following page provides a detailed listing of key development assumptions.

Key Development Assumptions

Assumption Category	Factor
Maximum redevelopment land + improvement value per SF of land*	\$10.00
Market Factor	10%
% of commercial zoning to residential use	10%
% of employment zoning (EG) to residential use	0%
% of employment zoning (EX) to residential use	75%

% of industrial zoning to residential use	0%
% of institutional zoning to residential use	case-by-case
% of residential zoning to residential use	100%
% of industrial zoning to commercial use	0%
% of employment zoning (EX) to commercial use	25%
Land area (SF) per housing unit in R1 zoning	2,000
Land area (SF) per housing unit in R2 zoning	2,000
Land area (SF) per housing unit in R2.5 zoning	2,500
Land area (SF) per housing unit in R3 zoning	3,000
Land area (SF) per housing unit in R5 zoning	5,000
Land area (SF) per housing unit in R7 zoning	7,000
Land area (SF) per housing unit in R10 zoning	10,000
Land area (SF) per housing unit in RH zoning* *	2,000
Land area (SF) per housing unit in commercial zoning	2,000
Land area (SF) per housing unit in institutional zoning	2,000

Land area (SF) per housing unit in EX zoning	2,000
Maximum FAR for CG zoning	3.00
Maximum FAR for CM zoning	1.00
Maximum FAR for CN zoning	0.75
Maximum FAR for CS zoning	3.00
Maximum FAR for CX zoning	4.00
Maximum FAR for CO zoning	2.00
Maximum FAR for EX zoning	3.00
Maximum FAR for EG zoning	3.00
Maximum FAR for IG1 zoning	0.50
Maximum FAR for IH zoning	0.50
Maximum FAR for IRD zoning	2.00
Commercial building SF per employee	500
Commercial office building SF per employee	250
Institutional building SF per employee	1,500
Industrial building SF per employee	750
Demand for commercial space per new housing unit***	50

Note: * Applied to individual parcels and combined value of contiguous parcel groups of 10,000 square feet or more under common ownership.

** Requires a revision to RH zoning (current minimum is 1,000 SF/unit).

*** Occupied retail space per household for the four-county region as of 1997 (Grubb & Ellis and Metro data).

Description of Results

Results of applying the methodology and assumptions described previously are summarized below in tabular and narrative form.

It is important to note that calculations of added building space, jobs, and housing are presented in gross rather than net terms. These allocations reflect new construction only and do not account for potential losses that could result from redevelopment of parcels that have existing residential, commercial, and/or industrial uses. Determination of potential displacement is beyond the scope of this analysis.

Developable Land in Acres

Use	Developable	Allocated*
Residential	5.8	5.2
Other	2.4	2.2
Total	8.2	7.4

*Note: Reduced by market factor of 10%.

Added Commercial/ Industrial Building Space

Use	Building Space (SF)
Retail	112,800
Office	0
Industrial	106,800
Total	219,600

Note: This does not include the 1,500 SF of retail or 2,900 SF day care facility being constructed on old DMV site.

Added Jobs

Use	Jobs
Retail	226

- The majority of the 8.2 acres of developable land within the 60th Light Rail Station Area is zoned residential. In addition, 10% of the developable commercial land was also allocated to residential development.
- Build-out of developable commercial and industrial lands at maximum allowable floor area ratios (FAR) results in 112,800 square feet of added retail space and 106,800 square feet of added industrial space. However, added households (including the units being developed on the DMV site) generate demand for only about 21,000 square feet of additional retail space. There are no developable parcels zoned for commercial office development in the study area.
- Build-out of developable commercial and industrial lands would provide approximately 226 additional retail and 142 non-retail jobs within the study area.
- Appropriately zoned vacant and redevelopable land could accommodate 22 single family and 82 multi-family housing units in addition to those being developed on the DMV site. These added units are estimated at an average density of 20 units per net acre.

Other	142
Total	368

Note: This does not include potential employment associated with redevelopment of the DMV site.

Added Housing

Type	Units
Single Family	22
Multi-Family	82
Total	104
Average New Unit Density	20.0

Note: This does not include the 314 multi-family units being constructed on old DMV site.

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→ **Appendix D Economic Development Allocation Analysis**

Allocations 82nd Station Community - Printable Version

**E. D. Hovee
& Company**
Economic and Development Services

Memorandum

To: Deena Platman, Portland Department of Transportation
From: Denise Whitney, Project Economist
Subject: 2040 Centers TGM Project: 82nd Avenue Light Rail Station Area Allocations
Date: June 30, 1999

Introduction

The following memorandum provides the methodology and results of an economic development allocation analysis for the 82nd Avenue Light Rail Station Area. The purpose of this analysis is to provide a build-out estimate of future employment and housing for the study area as part of the 2040 Centers TGM project.

Qualifications & Limitations

The economic development allocation analysis was prepared for the City of Portland Department of Transportation by the economic and development consulting firm E.D. Hovee & Company as part of the 2040 Centers TGM project.

Observations and findings are those of E.D. Hovee & Company and should not be construed as representing the opinion of any other party without that party's express endorsement, whether in whole or in part.

Organization of Memorandum

The remainder of this memorandum is organized to cover the following topics:

- Analysis Methodology
 - Description of Results

**Allocations 122nd Station
Community**

**Allocations Hillsdale Town
Center**

**Allocations St. Johns Town
Center**

**Allocations West Portland
Town Center**

**Allocations 60th Station
Community**

**Allocations 82nd Station
Community**

**Allocations 148th Station
Community**

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comments on our site, please
contact our site administrator.

Analysis Methodology

This economic development analysis is based on a review of the Portland Comprehensive Plan and Portland Zoning Code and relies on data provided by the Portland Department of Transportation including:

- Vacant lands inventory by parcel
- Redevelopment parcels inventory (identified as parcels where land value + improvement value/land square foot is equal to or less than \$10.00)
- Contiguous ownership inventory
- Zoning by parcel

The build-out allocation identifies long-term development capacity for the study area given comprehensive plan zoning and a 10% market factor assuming:

- Infill of existing vacant single family zoned parcels.
- Multi-family development on appropriately zoned vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more at densities consistent with zoning minimums.
- Commercial land development allocated 90% to commercial and 10% to residential use. The amount of commercial development generated by added households is also noted.
- Industrial land development on vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more.

The chart on the following page provides a detailed listing of key development assumptions.

Key Development Assumptions

Assumption Category	Factor
Maximum redevelopment land + improvement value per SF of land*	\$10.00
Market Factor	10%
% of commercial zoning to residential use	10%
% of employment zoning (EG) to residential use	0%
% of employment zoning (EX) to residential use	75%
% of industrial zoning to residential use	0%

% of institutional zoning to residential use* *	0%
% of residential zoning to residential use	100%
% of industrial zoning to commercial use	0%
% of employment zoning (EX) to commercial use	25%
Land area (SF) per housing unit in R1 zoning	2,000
Land area (SF) per housing unit in R2 zoning	2,000
Land area (SF) per housing unit in R2.5 zoning	2,500
Land area (SF) per housing unit in R3 zoning	3,000
Land area (SF) per housing unit in R5 zoning	5,000
Land area (SF) per housing unit in R7 zoning	7,000
Land area (SF) per housing unit in R10 zoning	10,000
Land area (SF) per housing unit in RH zoning* * *	2,000
Land area (SF) per housing unit in commercial zoning	2,000
Land area (SF) per housing unit in institutional zoning	2,000
Land area (SF) per housing unit in EX zoning	2,000

Maximum FAR for CG zoning	3.00
Maximum FAR for CM zoning	1.00
Maximum FAR for CN zoning	0.75
Maximum FAR for CS zoning	3.00
Maximum FAR for CX zoning	4.00
Maximum FAR for CO zoning	2.00
Maximum FAR for EX zoning	3.00
Maximum FAR for EG zoning	3.00
Maximum FAR for IG1 zoning	0.50
Maximum FAR for IH zoning	0.50
Maximum FAR for IR zoning	2.00
Commercial building SF per employee	500
Commercial office building SF per employee	250
Institutional building SF per employee	1,500
Industrial building SF per employee	750
Demand for commercial space per new housing unit****	50

Note: * Applied to individual parcels and combined value of contiguous parcel groups of 10,000 square feet or more under common ownership.

** Multnomah Bible College expects to use land under its ownership for current and future expansion.

*** Requires a revision to RH zoning (current minimum is 1,000 SF/unit).

**** Occupied retail space per household for the four-county region as of 1997 (Grubb & Ellis and Metro data).

Description of Results

Results of applying the methodology and assumptions described previously are summarized below in tabular and narrative form.

It is important to note that calculations of added building space, jobs, and housing are presented in gross rather than net terms. These allocations reflect new construction only and do not account for potential losses that could result from redevelopment of parcels that have existing residential, commercial, and/or industrial uses. Determination of potential displacement is beyond the scope of this analysis.

Developable Land in Acres

Use	Developable	Allocated *
Residential	3.8	3.4
Other	6.5	5.8
Total	10.3	9.2

*Note: Reduced by market factor of 10%.

Added Commercial/ Industrial Building Space

Use	Building Space (SF)
Retail	558,000
Office/ Institutional	136,900
Industrial	21,100
Total	716,000

Note: Build-out of the developable institutional property owned by Multnomah Bible College accounts for all estimated office/institutional space.

Added Jobs

Use	Jobs
Retail	1,116

Other	119
Total	1,235

Added Housing

Type	Units
Single Family	10
Multi-Family	59
Total	69
Average New Unit Density	20.2

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→ **Appendix D Economic Development Allocation Analysis**

Allocations 148th Station Community - Printable Version

**E. D. Hovee
& Company**
Economic and Development Services

Memorandum

To: Deena Platman, Portland Department of Transportation
From: Denise Whitney, Project Economist
Subject: 2040 Centers TGM Project: 148th Avenue Light Rail Station Area Allocations
Date: June 30, 1999

Introduction

The following memorandum provides the methodology and results of an economic development allocation analysis for the 148th Avenue Light Rail Station Area. The purpose of this analysis is to provide a build-out estimate of future employment and housing for the study area as part of the 2040 Centers TGM project.

Qualifications & Limitations

The economic development allocation analysis was prepared for the City of Portland Department of Transportation by the economic and development consulting firm E.D. Hovee & Company as part of the 2040 Centers TGM project.

Observations and findings are those of E.D. Hovee & Company and should not be construed as representing the opinion of any other party without that party's express endorsement, whether in whole or in part.

Organization of Memorandum

The remainder of this memorandum is organized to cover the following topics:

- Analysis Methodology
 - Description of Results

**Allocations 122nd Station
Community**

**Allocations Hillsdale Town
Center**

**Allocations St. Johns Town
Center**

**Allocations West Portland
Town Center**

**Allocations 60th Station
Community**

**Allocations 82nd Station
Community**

**Allocations 148th Station
Community**

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Analysis Methodology

This economic development analysis is based on a review of the Portland Comprehensive Plan and Portland Zoning Code and relies on data provided by the Portland Department of Transportation including:

- Vacant lands inventory by parcel
- Redevelopment parcels inventory (identified as parcels where land value + improvement value/land square foot is equal to or less than \$10.00)
- Contiguous ownership inventory
- Zoning by parcel

The build-out allocation identifies long-term development capacity for the study area given comprehensive plan zoning and a 10% market factor assuming:

- Infill of existing vacant single family zoned parcels.
- Multi-family development on appropriately zoned vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more at densities consistent with zoning minimums.
- Commercial land development allocated 90% to commercial and 10% to residential use. The amount of commercial development generated by added households is also noted.
- Industrial land development on vacant and redevelopable parcels and redevelopable contiguous parcel groups under common ownership of 10,000 square feet or more.

The chart on the following page provides a detailed listing of key development assumptions.

Key Development Assumptions

Assumption Category	Factor
Maximum redevelopment land + improvement value per SF of land*	\$10.00
Market Factor	10%
% of commercial zoning to residential use	10%
% of employment zoning (EG) to residential use	0%
% of employment zoning (EX) to residential use	75%
% of industrial zoning to residential use	0%

% of institutional zoning to residential use	case-by-case
% of residential zoning to residential use	100%
% of industrial zoning to commercial use	0%
% of employment zoning (EX) to commercial use	25%
Land area (SF) per housing unit in R1 zoning	2,000
Land area (SF) per housing unit in R2 zoning	2,000
Land area (SF) per housing unit in R2.5 zoning	2,500
Land area (SF) per housing unit in R3 zoning	3,000
Land area (SF) per housing unit in R5 zoning	5,000
Land area (SF) per housing unit in R7 zoning	7,000
Land area (SF) per housing unit in R10 zoning	10,000
Land area (SF) per housing unit in RH zoning* *	2,000
Land area (SF) per housing unit in commercial zoning	2,000
Land area (SF) per housing unit in institutional zoning	2,000
Land area (SF) per housing unit in EX zoning	2,000

Maximum FAR for CG zoning	3.00
Maximum FAR for CM zoning	1.00
Maximum FAR for CN zoning	0.75
Maximum FAR for CS zoning	3.00
Maximum FAR for CX zoning	4.00
Maximum FAR for CO zoning	2.00
Maximum FAR for EX zoning	3.00
Maximum FAR for EG zoning	3.00
Maximum FAR for IG1 zoning	0.50
Maximum FAR for IH zoning	0.50
Maximum FAR for IR zoning	2.00
Commercial building SF per employee	500
Commercial office building SF per employee	250
Institutional building SF per employee	1,500
Industrial building SF per employee	750
Demand for commercial space per new housing unit***	50

Note: * Applied to individual parcels and combined value of contiguous parcel groups of 10,000 square feet or more under common ownership.

** Requires a revision to RH zoning (current minimum is 1,000 SF/unit).

*** Occupied retail space per household for the four-county region as of 1997 (Grubb & Ellis and Metro data).

Description of Results

Results of applying the methodology and assumptions described previously are summarized below in tabular and narrative form.

It is important to note that calculations of added building space, jobs, and housing are presented in gross rather than net terms. These allocations reflect new construction only and do not account for potential losses that could result from redevelopment of parcels that have existing residential, commercial, and/or industrial uses. Determination of potential displacement is beyond the scope of this analysis.

Developable Land in Acres

Use	Developable	Allocated*
Residential	76.5	68.8
Other	14.4	13.0
Total	90.9	81.8

*Note: Reduced by market factor of 10%.

Added Commercial/ Industrial Building Space

Use	Building Space (SF)
Retail	1,034,800
Office	136,100
Industrial	0
Total	1,170,900

- The majority of the 90.9 acres of developable land within the 148th Light Rail Station Area is zoned for residential use. In addition, 10% of the developable commercial land was also allocated to residential development.
- Build-out of developable commercial lands at maximum allowable floor area ratios (FAR) results in over 1.03 million square feet of added retail space and 136,100 square feet of added commercial office space. However, added households generate demand for only about 72,200 square feet of additional retail space. There are no developable parcels zoned for industrial development in the study area.
- Build-out of developable commercial lands would provide approximately 2,070 additional retail and 544 non-retail jobs within the study area.
- Appropriately zoned vacant and redevelopable land could accommodate 96 single family and 1,348 multi-family housing units. These added units are estimated at an average density of 21.0 units per

Added Jobs

Use	Jobs
Retail	2,070
Other	544
Total	2,614

Added Housing

Type	Units
Single Family	96
Multi-Family	1,348
Total	1,444
Average New Unit Density	21.0

Case Study 1 Hillsdale Town Center

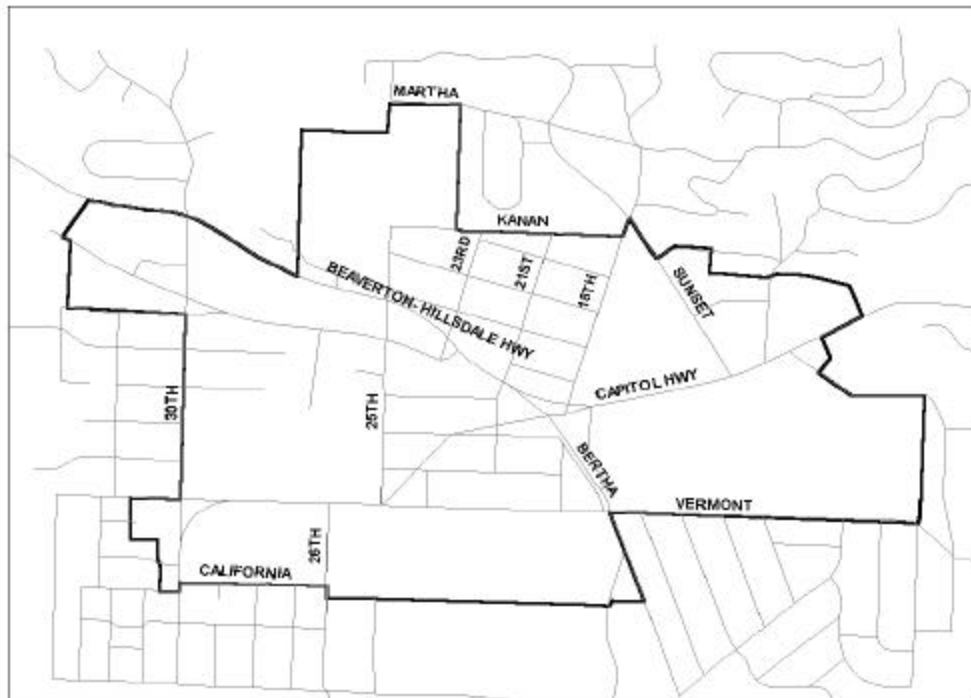
Study Area Profile

Location

The Hillsdale Town Center is centrally located in the heart of Southwest Portland. The center lies at the intersection of Beaverton-Hillsdale Hwy and SW Capitol Hwy. Its northern boundary follows a jagged course along SW Beaverton-Hillsdale Highway, up to SW Martha Court and down to SW Kanan. SW California and SW Vermont serve as the southern boundary. To the west is SW 30th. The eastern edge of Wilson High School marks the east edge of the center. The study area encompasses approximately 278 acres.

The center lies primarily within the Hillsdale neighborhood. The area northwest of SW 30th and SW Vermont is in the Hayhurst neighborhood and the area south of Vermont and west of 26th is in the Multnomah neighborhood.

Figure 1-1: Hillsdale Town Center Vicinity Map

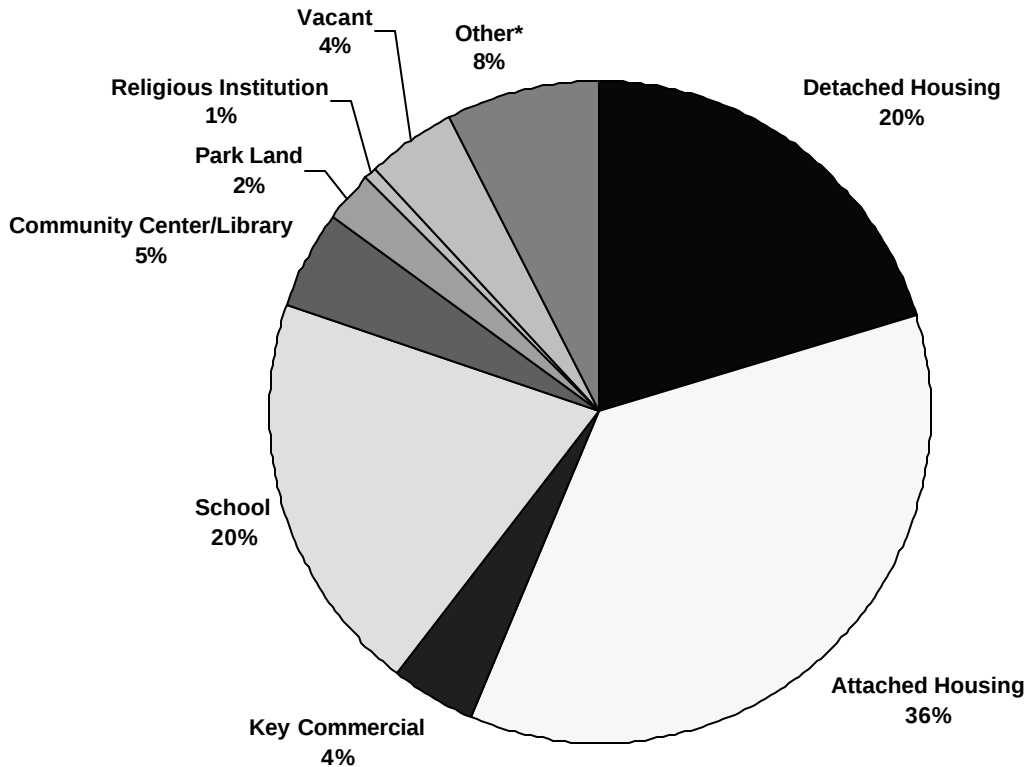


Land Use

Current Land Use Pattern

Figure 1-2 charts the land use distribution for the Hillsdale Town Center. The center is unique in the amount of acreage used for “public” uses. Approximately 27% of the area are used for schools, parks, library and community center.

Figure 1-2: Hillsdale Town Center Land Use Distribution



* Other category includes Vehicle Services, Industrial uses, Commercial and Retail uses not identified as key commercial, and Institutional Uses excluding schools, civic uses, and religious uses.

Residential land uses make up just half of the total area in the center. Attached housing units comprise 1153 units or 82% of the total units. Detached units number 251 or 18% of total residential units.

The central commercial district runs along SW Capitol Hwy in the eastern half of Hillsdale Town Center. It is a mix of retail, commercial, and service establishments set in an auto-oriented strip commercial environment. A second, smaller commercial node is located near the western edge of the Center, also along Capitol Highway. Table 1-1 shows the mix and number of key commercial activities located in the center.

Table 1-1: Distribution of Key Commercial Activities in Hillsdale Town Center

Key Commercial Categories	Number of Establishments
Grocery	4
Drug Store	1
Restaurant	13
Personal Services	8
Retail Goods	7
Professional Services	10

There are approximately 28 commercial structures in the area. Of these structures, about 40% have pedestrian-transit friendly designs.

The center has a variety of employers - public and private schools, professional offices, and retail establishments. Employment figures for 1996 show that approximately 1190 people work in the area. Three employers in the area are subject to Eco-rule trip reduction requirements.

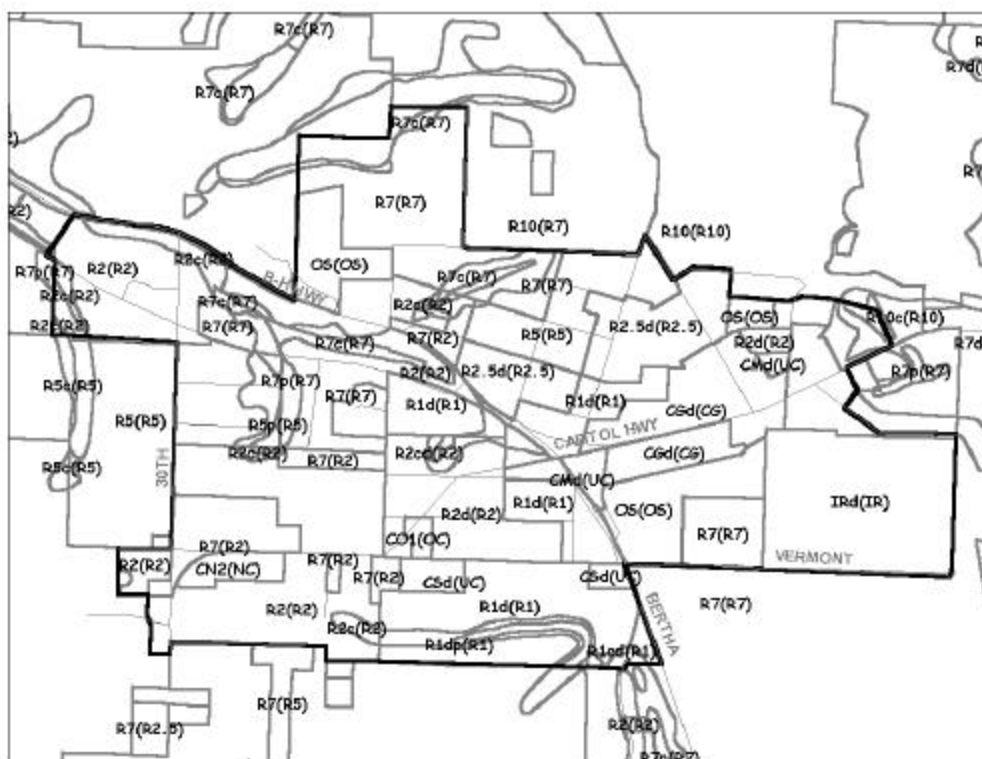
Zoning

Figure 1-3 shows the current zoning found in the Hillsdale Town Center. The core commercial district is primarily zoned General Commercial (CG) which allows more auto-oriented type development. There are pockets of Storefront Commercial (CS) and Neighborhood Commercial (CN2) that support mixed-use.

The residential zoning ranges from low density, R7 and R5 designations (6.2 and 8.7 units per acre, respectively), to medium density multi-family designations such as R1, R2, and R2.5. A number of parcels with low-density residential zoning have comprehensive plan designations which allow higher density residential development.

This area is part of the Southwest Community Plan process, which is currently inactive. Should the plan be completed, some zoning designations may be adjusted to more adequately reflect the desired town center urban form.

Figure 1-3: Hillsdale Town Center Zoning



Parks and Open Space

Hillsdale Town Center has two parks within its boundary, Hillsdale and Dewitt. Hillsdale Park is approximately five acres. Dewitt Park, one acre, serves as a pocket park. The center also has a number of schools with athletic fields that provide recreational space. To the east of Hillsdale is George Himes Park and to the west are Gabriel Park and Kelly Park.

Community and Municipal Facilities

Hillsdale Town Center has a number of civic facilities. These include four schools: Mary Reike Elementary, Robert Gray Middle School, Wilson High School, and Portland Jewish Academy (housed in Mittleman Jewish Community Center). Additionally, Hillsdale is served by a public library and Portland Fire Station No. 5. The Mittleman Jewish Community Center is also located in the area. Just to the west outside of the Hillsdale Town Center is the new Southwest Community Center.

Circulation

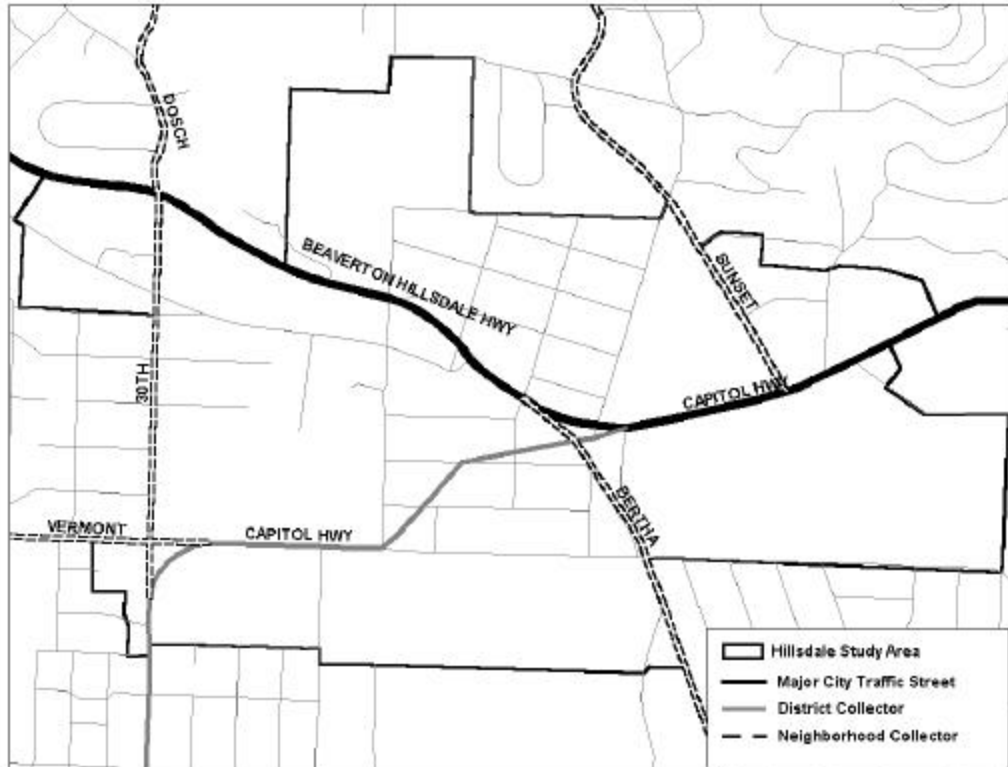
Hillsdale Town Center does not exhibit a traditional grid street pattern. Rather, the street pattern is determined by the diagonal alignment of the major through streets and topography. The major east-west streets include SW Beaverton-Hillsdale Hwy, Capitol Hwy, and Vermont. The principal north-south streets are 30th, Sunset, and Bertha.

The presence of several large institutional uses limits the ability to connect streets throughout the center. There are a number of dead-end streets. Also common are “paper” streets that have not been built but for which the right-of-way is preserved. The average length between street connections is 702 linear feet.

Traffic

Figure 1-4 shows the traffic street classifications and Figure 1-5 maps the traffic volumes for primary streets in the Hillsdale Town Center. Beaverton-Hillsdale Hwy and SW Capitol Hwy, east of SW Bertha funnel a high volume of traffic to, from, and through the center. Both streets are classified as Major City Traffic Streets. West of SW Bertha, SW Capitol Hwy is classified as a District Collector connecting Hillsdale to Multnomah Village and West Portland Town Center. SW 30th, SW Bertha, and SW Sunset are Neighborhood Collectors providing local circulation in Hillsdale Town Center.

Figure 1-4: Hillsdale Town Center Traffic Street Classifications



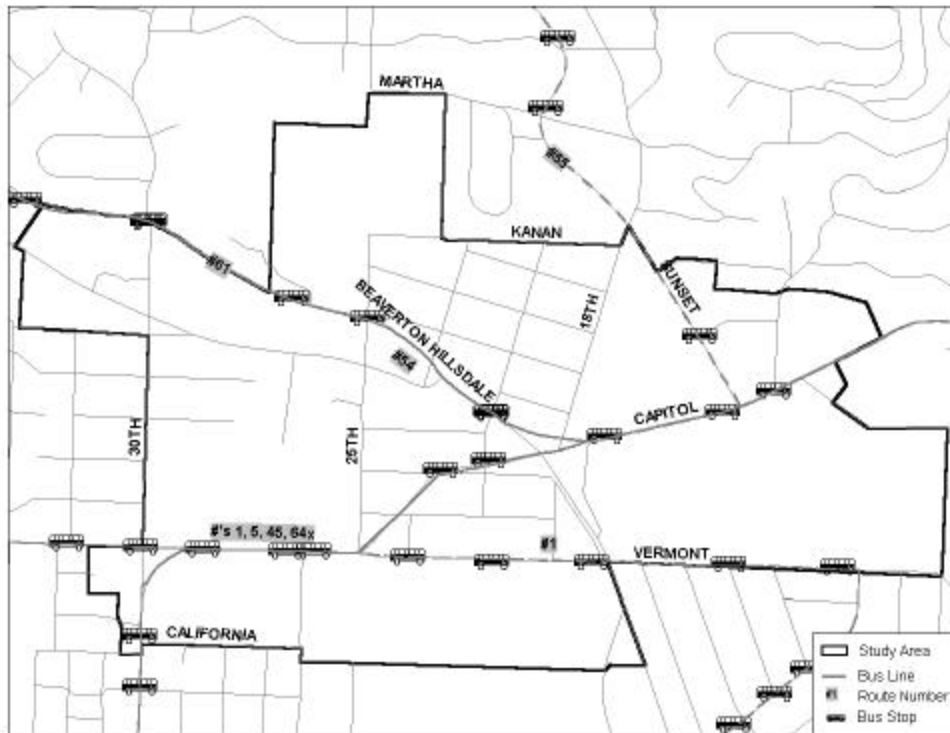
The map displays the state of Vermont with its major road network. Key features include:

- Towns:** BEAVERTON, HILLSDALE, CHESTER.
- Roads:** ROUTE 100, ROUTE 100A, ROUTE 100B.
- Geographical Features:** The state boundary with New Hampshire to the east and New York to the west is shown. The Green Mountains are depicted as a series of grey, jagged shapes.
- Other Labels:** VERMONT, CAPITOL, ROUTE 100, ROUTE 100A, ROUTE 100B, BEAVERTON, HILLSDALE, CHESTER.

Located at the intersection of SW Capitol Hwy and Beaverton-Hillsdale Hwy, Hillsdale Town Center receives a high level of transit service from bus routes connecting SW neighborhoods and western suburbs to downtown Portland. Figure 1-6 maps the transit routes and stops located in the Hillsdale Town Center.

1-6

Figure 1-6: Hillsdale Town Center Transit Service



Route #5 travels along SW Capitol Hwy from its origin at Portland Community College-Sylvania Campus to downtown Portland. Before entering Hillsdale, it makes stops at the Barbur Transit Center, Multnomah Center and Mittleman Community Center. Service begins at approximately 6:00am and continues until 10:30pm. Peak hour headways average 10 minutes with 15-minute headways the remainder of the day.

Route #45 connects Tigard and Washington Square to downtown Portland traveling along Garden Home Road and Capitol Highway. Service to Hillsdale is provided between 6:00am and 9:00pm at 30-minute intervals during peak periods and hourly the remainder of the day.

The 64X route provides express commuter service between Tigard and Marquam Hill. Service towards Marquam Hill is provided to Hillsdale stops between 6:00am and 8:00am at 30-minute headways. Return service towards Tigard is provided to Hillsdale stops every 30 minutes between 4:00pm and 6:00pm.

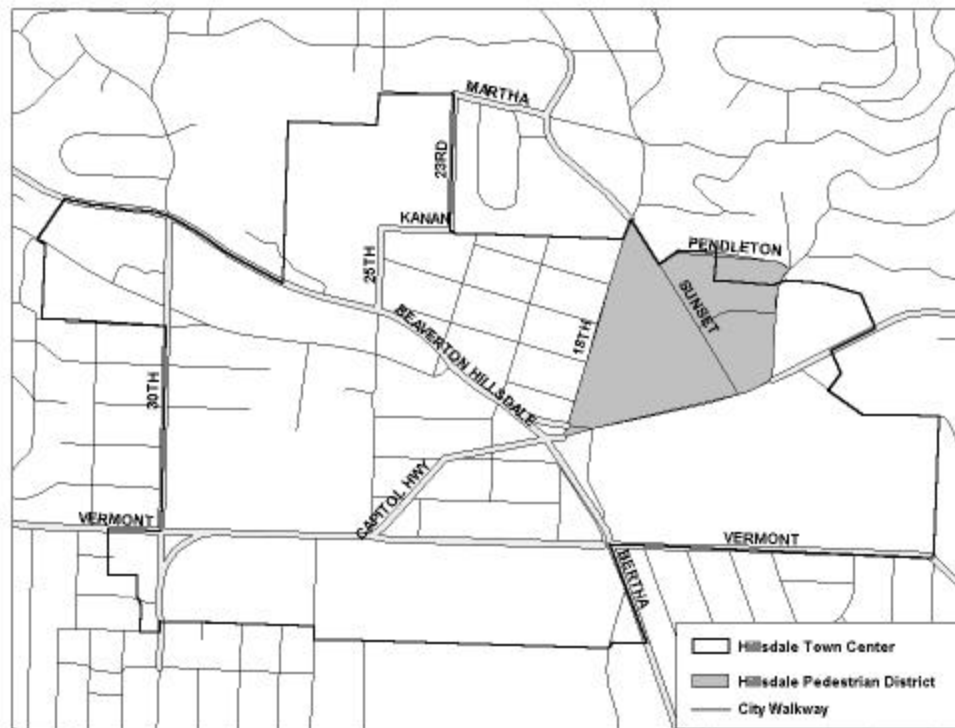
Routes #54, 56 and 61X enter the Hillsdale Town Center along the Beaverton-Hillsdale Highway. Route #54 originates at the Beaverton Transit Center where it intersects with the Westside MAX alignment. This route provides service to Hillsdale from approximately 5:15am to 11:45am at 30-minute headways. Route #56 travels between Washington Square, through Hillsdale, to downtown Portland along Scholls Ferry road and Beaverton-Hillsdale Hwy. Hillsdale service begins at 5:45am and continues at 30-minute headways until 12:45am. Route #61X provides similar service to the 64X. It offers commuter service between the Beaverton Transit Center (with a Max Light Rail Station) and Marquam Hill. Bus service to Hillsdale is provided between 6:40am and 8:20am and again between 6:40pm and 8:20pm at 30 minute headways during service periods.

Route #55 is also a commuter bus offering morning and afternoon service. It runs between Raleigh Hills and downtown Portland and enters Hillsdale along Sunset Blvd. Service to Hillsdale at SW Sunset and SW Capitol Hwy occurs between 6:30am and 10:30am and 2:30am and 7:00pm at 30 minute intervals.

Pedestrians

Figure 1-7 shows the streets classified as City Walkways in the area and the Hillsdale Pedestrian District. A survey of existing sidewalks in Hillsdale reveals a deficiency in pedestrian facilities. Of the streets classified as City Walkways, only SW Vermont is improved with sidewalks along its length through the center. Just recently, sidewalks were constructed along SW Capitol Hwy between the SW Bertha intersection and SW Cheltenham. The other City Walkways have incomplete pedestrian facilities. The local streets generally have not been improved with sidewalks.

Figure 1-7: Hillsdale Town Center Pedestrian Street Classifications

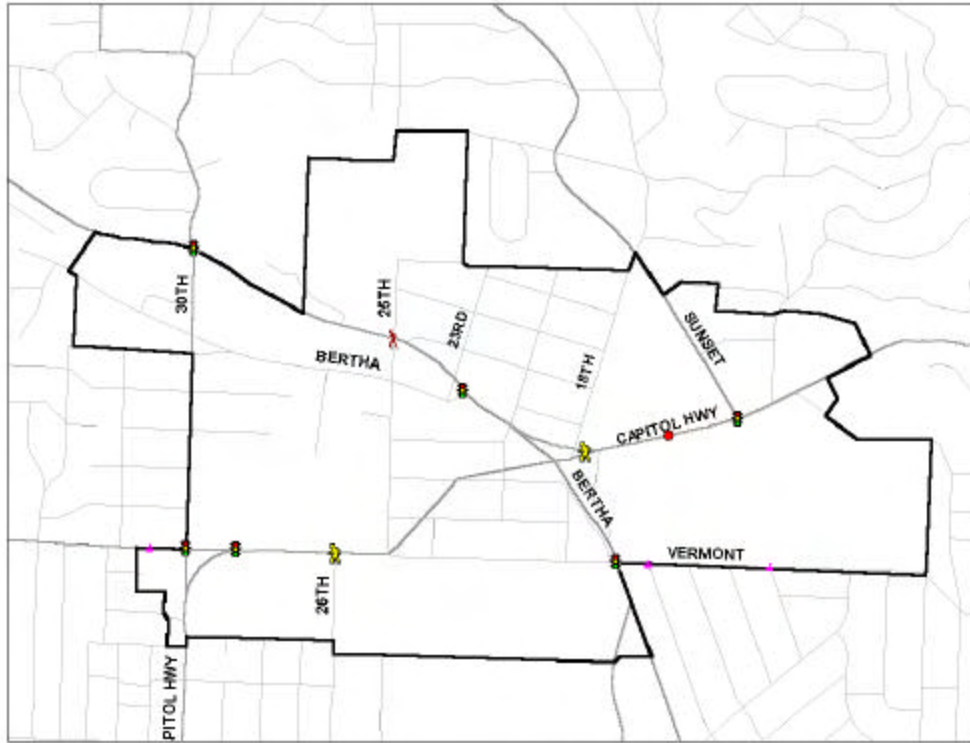


Capitol Highway is the primary street in pedestrian district. Improvement to district includes new, wider (10ft) sidewalks, new intersection with signalized pedestrian crossing. New, improved pedestrian link to high school. NW corner has new single story office building built to building line, parking in back/side. Gas station detracts, but fairly new and landscaped. Currently, poor pedestrian connections from Capitol Highway sidewalk to large retail strip on south side, resulting in extreme pedestrian-auto and auto-auto conflict.

On the north side, there are similar sidewalk improvements. An older but well-maintained strip center extends perpendicular to Capitol Highway, with sidewalk along storefronts. Several smaller retail buildings in addition to large strip center contribute to very poor site design and layout, including inefficient parking. Excess parking currently being used as park and ride lot could be redeveloped.

Figure 1-8 maps the traffic signals and marked pedestrian crossings that facilitate pedestrian crossing of busy streets.

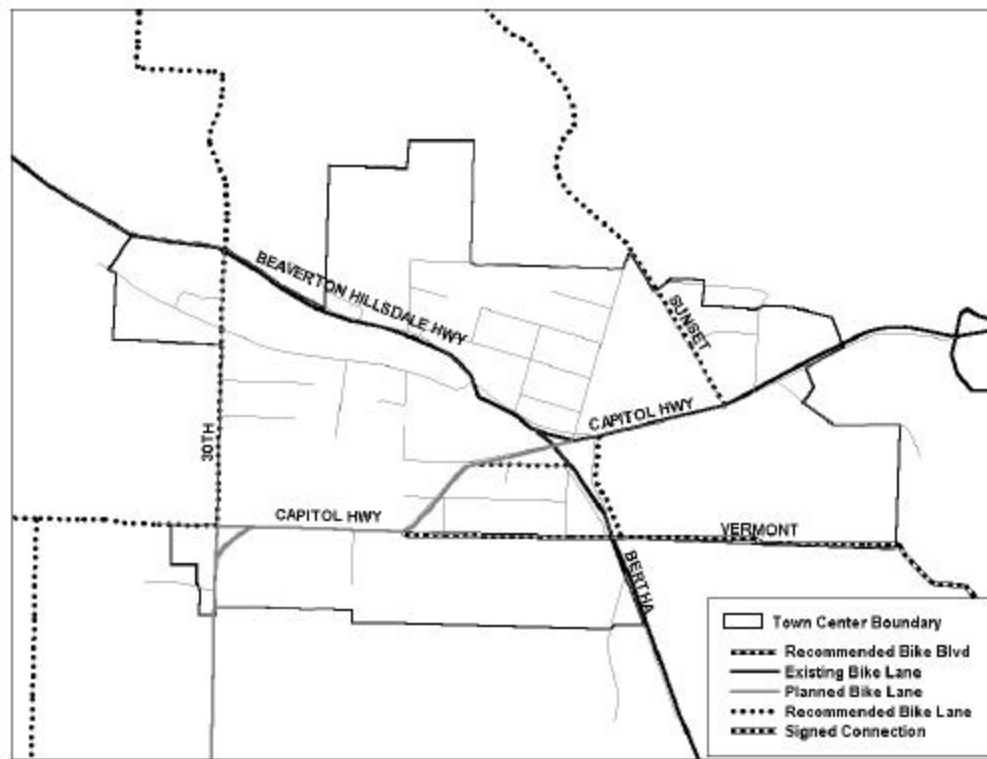
Figure 1-8: Hillsdale Town Center Traffic Signals



Bicycles

Figure 1-9 shows the bicycle network for this town center. Currently, bike lanes are striped along SW Beaverton-Hillsdale Hwy onto SW Capitol Hwy through the town center and along SW Bertha to SW Barbur Blvd. The bike lanes will be extended along SW Capitol Hwy from SW Bertha to Multnomah Village.

Figure 1-9: Hillsdale Town Center Bicycle Network



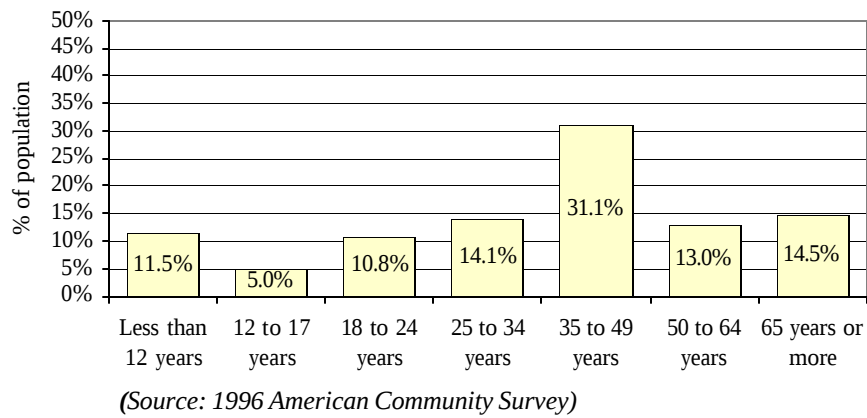
Population and Household Characteristics²

Age Distribution

Figure 1-10 shows the age distribution for the Hillsdale Town Center area. As of 1996, the largest age group in the Town Center area consists of residents from 35 to 49 years of age. The age group with the lowest proportion of residents includes adolescents (12 to 17 years). The remaining age groups are distributed fairly evenly, ranging from a low of 10.8% (18 to 24 years) to a high of 14.5% (65 years or more).

² Since data is reported on the basis of block groups, the following medians and percentages are based on block group medians and totals.

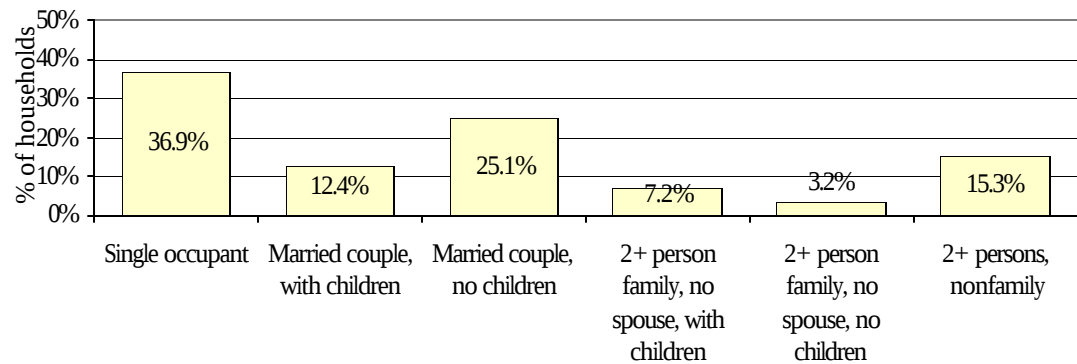
Figure 1-10: Age Distribution



Household size and type

The largest proportions of households in the Town Center area were single occupants, which represented 36.9% of the total households, and married couples with no children, which represented 25.1%. The next most common household types were non-family households with two or more persons (15.3%) and married couples with children (12.4%). Family households with two or more persons and no spouse present—with or without children—made up the smallest share of the households (10.4%).

Figure 1-11: Household size and type

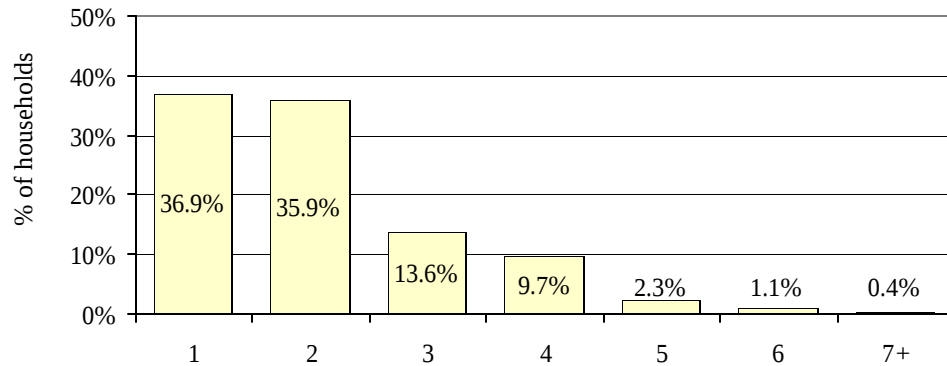


(Source: 1996 American Community Survey)

Persons Per Household

The majority of households in the area are made up of only 1 or 2 persons (the combined share is 71.8%). The remaining household configurations make up relatively smaller shares, declining from 13.6% to 0.4% as the number of persons per household increase from 3 persons to 7 or more.

Figure 1-12: Persons per Household

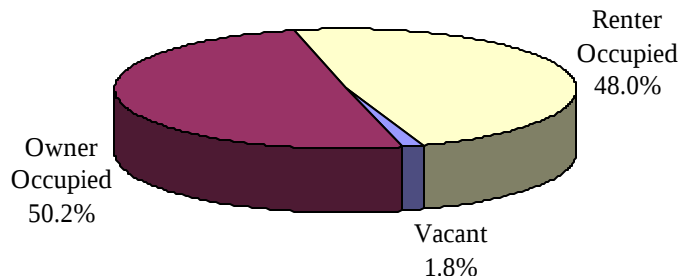


(Source: 1996 American Community Survey)

Tenure and Occupancy Status

As of 1996, the proportions of owner occupied and renter occupied housing in the Town Center area are nearly identical (50.2% owner compared to 48% renter). Almost 2% of the housing units are vacant.

Figure 1-13: Tenure and Occupancy Status

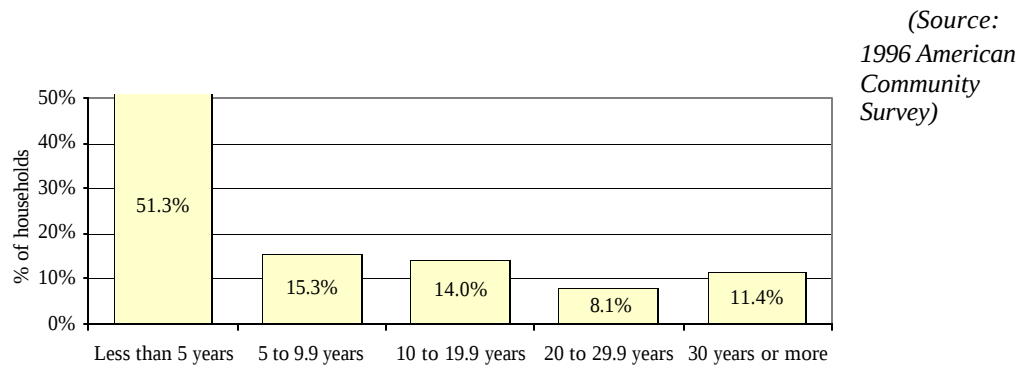


(Source: 1996 American Community Survey)

Length of Residence

Over half of the residents in the Town Center (51.3%) moved to the area fewer than 5 years before 1996. This may be related to the high percentage of renters in the area, who tend to move more often than homeowners do. Just fewer than 20% of the households had lived in the area for 20 years or more as of 1996.

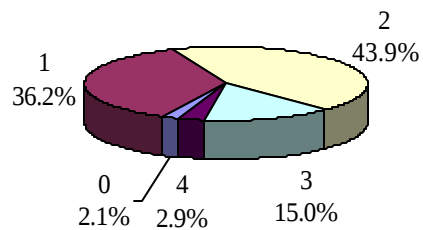
Figure 1-14: Length of Residence



Vehicle Availability

As of 1996, the large majority of households in the Town Center area (78.1%) had one or two vehicles available for use; 36.2% had one vehicle, 43.9% had two. Of the remaining households, 15% had 3 vehicles, 2.9% had 5 or more, and only 2.1% had no vehicle available.

Figure 1-15: Vehicles per Household



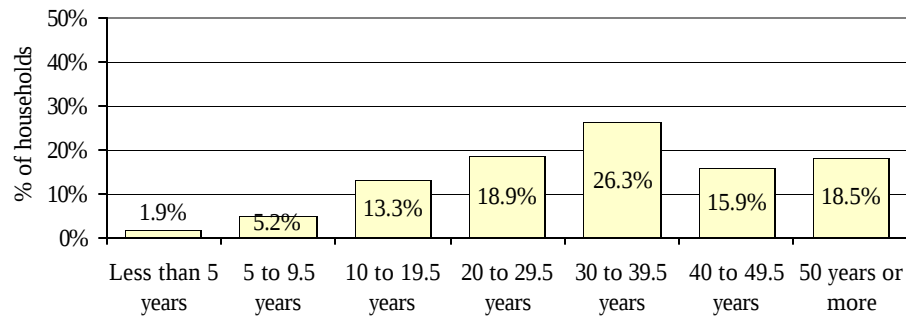
(Source: 1996 American Community Survey)

Housing Characteristics

Age of Housing

Until about 10 years ago, the pace of housing construction had been fairly consistent, ranging from the construction of 13.3% of the existing housing structures (1977 through 1986) to 26.3% (1957 through 1966). As of 1996, only 7.1% of the housing had been built within the last 10 years.

Figure 1-16: Age of Housing Structure



(Source: 1996 American Community Survey)

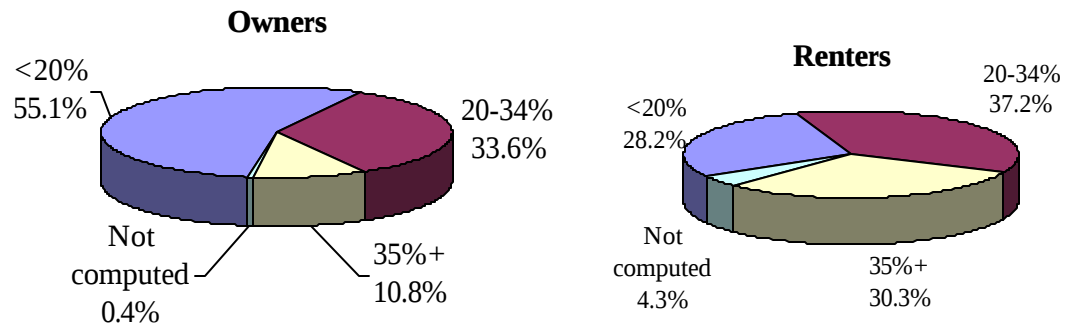
Housing Costs

In 1996, according to the American Community Survey, the median house value in the Town Center area was \$167,083. The median contract rent for residential housing was \$636 per month.

Housing Costs as a Percentage of Household Income.

In 1996, the largest share of homeowners in the area (55.1%) spent less than 20 percent of their household income on housing. Nearly 34% spent 20-34 percent of their income on housing and only 10.8% spent 35 percent of their income or more. Only 28.2% of renters, on the other hand, spent less than 20 percent of their income on housing, while 37.2% spent 20-34 percent and 30.3% spent 35 percent or more.

Figure 1-17: Owner vs. Renter Housing Costs as a Percentage of 1996 Household Income



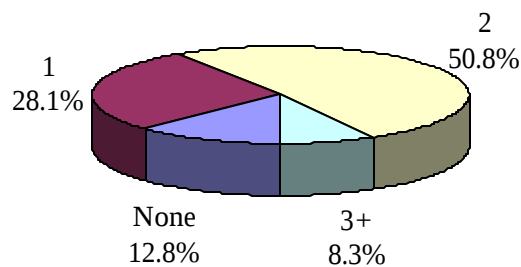
(Source: 1996 American Community Survey)

Employment Characteristics

Workers Per Family

The largest share of families in the Town Center area (50.8%) has 2 workers and the second highest share (12.8%) has only one worker per family. Almost 13 percent of the families do not have a worker in their family, while 8.3 percent have more than two workers.

Figure 1-18: Workers per Family



(Source: 1996 American Community Survey)

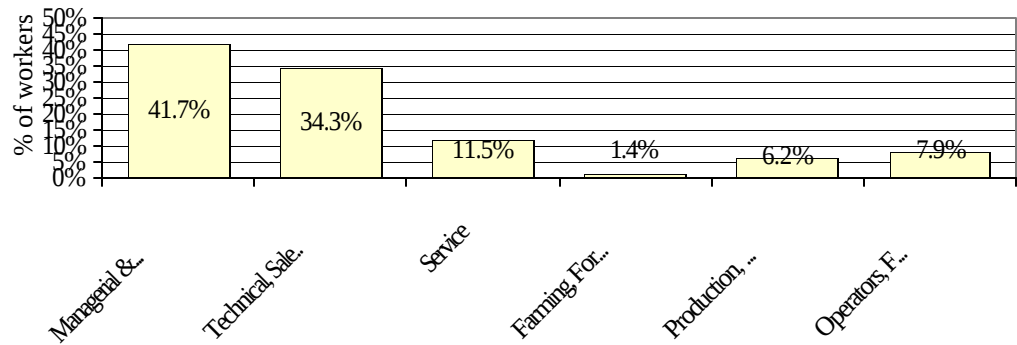
Household Income

According to American Community Survey data, the median 1996 adjusted household income for the Town Center area was \$46,773.

Occupation of Local Workforce

In 1996, the occupations with the highest share of workers from the Town Center area were managerial and professional occupations (41.7%) and technical, sales and administrative occupations (34.3%). Only 11.5% of the workforce worked in service occupations; 7.9% worked as operators, fabricators or laborers; 6.2% in production, craft or repair and 1.4% in farming, forestry and fishing occupations.

Figure 1-19: Occupations



(Source: 1996 American Community Survey)

Place of Work for Area Residents.

Most of the local residents (73.6%) work in Multnomah County, with nearly all of those employed in the City of Portland (71.1%). Only 3.5% commuted outside the Portland metropolitan region.

Figure 1-20: Place of Work: State & County

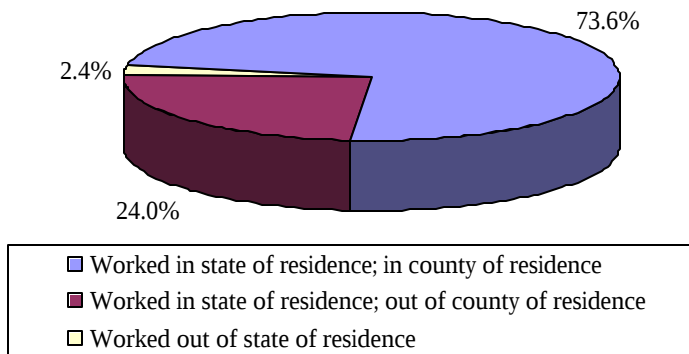
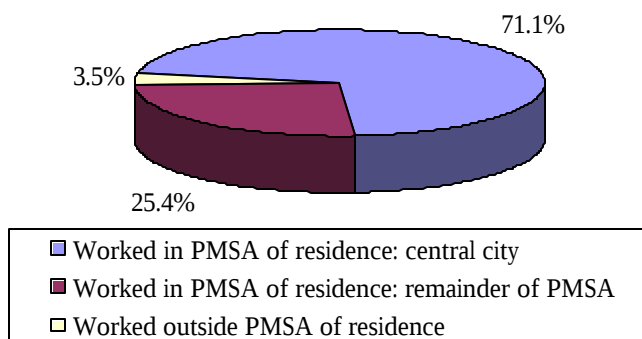


Figure 1-21: Place of Work: PMSA



(Source: 1996 American Community Survey)

Descriptor Values

The baseline descriptors' values for the Hillsdale Town Center are listed below.

Density

The density descriptors measure the intensity of development in an area. The calculation of density is based on net acreage. The net acreage in the Hillsdale Town Center is 247 acres.

- ◆ Single Family Density = 1 dwelling unit per net acre
- ◆ Multi family density = 5 dwelling units per net acre
- ◆ Total residential density = 7 dwelling units per net acre
- ◆ Total employment density = 5 employees per net acre

Diversity

The diversity descriptors measure the mix of uses in an area.

	Number of Uses	% of Total Land Use Area within Center
Detached Residential	251	20%
Attached Residential	1153	36%
Key Commercial Activities	43	4%
Schools	4	20%
Community Center/Library	2	5%
Parks	2	2%

Design

The design descriptors measure street and building characteristics.

The following descriptors relate to the street pattern and design:

- ◆ Intersection density = 7.5 intersections per mile
- ◆ Percentage of street segments with sidewalks along both sides of the street = 13%
- ◆ Percentage of designated bicycle facilities built to date = 46%

Twenty-eight commercial properties were evaluated for transit/pedestrian friendliness. The criteria used to evaluate each property include:

1. Building setback within 25 feet of the transit/pedestrian street.
 2. No vehicle parking between the transit/pedestrian street and building.
 3. Main entrance to the building oriented to the transit/pedestrian street.
- ◆ Percentage of properties meeting three criteria = 21%
 - ◆ Percentage of properties meeting two criteria = 18%
 - ◆ Percentage of properties meeting one criterion = 39%
 - ◆ Percentage of properties meeting none of the criteria = 22%

Transit Service

The transit service descriptors measure the quality of transit service in the area.

The transit service descriptors measure the quality of transit service in the area.

- ◆ Number of lines serving the area = 9

Route	Peak Hour Headway	Mid-day Headway	Service Hours
#1	15 minutes	30 minutes	15.5 hours
#5	10 minutes	15 minutes	16.5 hours
#45	30 minutes	60 minutes	15 hours
#54	30 minutes	30 minutes	17.5 hours
#55	30 minutes	No Service	7 hours
#56	30 minutes	30 minutes	19 hours
#61x	30 minutes	No Service	3.5 hours
#64X	30 minutes	No service	4 hours

Transportation Demand Management

The transportation demand management descriptor is a tally of employer TDM programs in the area.

- ◆ Number of employers subject to Eco-rule requirements = 3

Parking

The parking descriptors measure the availability and cost of area parking.

- ◆ Average cost of parking per hour = \$0.00
- ◆ Average off-street parking spaces per 1000sf of commercial use = 5.6 spaces/1000sf

Demographics

The demographic descriptors measure key socio-economic patterns in the area.

- ◆ Median income = \$46,773
- ◆ Household Size

Number of Persons in Household	Percentage
1 Person	37%
2 Persons	36%
3 Persons	17%
4 Persons	10%
5 Persons	2%
6 Persons	1%
7 or More Persons	0%

- ◆ Household Workers

Number of Workers in Household	Percentage
0 Workers	13%
1 Worker	28%
2 Workers	51%
3 or More Workers	8%

◆ Vehicle Ownership

Number of Vehicles	Percentage
No Vehicles	1%
1 Vehicle	28%
2 Vehicles	41%
3 Vehicles	24%
4 Vehicles	4%
5 or More Vehicles	2%

Travel Profile

The Hillsdale Town Center travel profile is based on data corresponding to Metro's transportation analysis zones 51, 56, and 945, aggregated to a single zone approximating the town center area.

In 1994, an estimated 55,334 person trips occurred to and from the Hillsdale Town Center. Of these, 4% were local trips, occurring entirely within the area. The overwhelming majority of trips come to or from other zones.

Table 1-2 displays the distribution of trips by purpose. The majority of trips fall into the Home-based Other category. Notable is the relatively large percentage of Non-home-based Non-Work trips (20%). This indicates that town center employees are using the commercial services available in the area. However, as seen in Table X, Mode Split by Purpose, these trips are most frequently occurring by auto.

Table 1-2: Hillsdale Town Center Trip Distribution by Trip Purpose

Trip Purpose	% of Total Person Trips
Home-based Work Trips	18%
Home-based Other Trips	47%
Non-home-based Work Trips	8%
Non-home-based Non-work Trips	20%
College Trips	1%
K-12 School Trips	6%

The distribution of mode split by trip purpose is shown in Table 1-3. In all categories, Drive Alone trips capture the greatest mode share. Only 12% of employees choose to take transit, walk, or bike to work. The highest transit, walk, and bike mode shares occur

in the College and School categories. However, these trips represent only 7% of the total trips in the zone.

Table 1-3: Hillsdale Town Center Mode Split by Trip Purpose

Trip Purpose	Drive Alone	Shared Auto	Transit	Walk & Bike	School Bus
Home-based Work	73%	15%	9%	3%	0%
Home-based Other	59%	33%	3%	5%	0%
Non-home-based Work	63%	36%	1%	0%	0%
Non-home-based Non-work	63%	36%	1%	0%	0%
College	43%	24%	26%	8%	0%
K-12 School	3%	2%	19%	54%	22%

Figures 1-22 and 1-23 show the primary travel patterns between the Hillsdale Town Center and other transportation zones. Of the total trips for the area, 56% originate in Hillsdale and 44% travel to the zone. The most striking travel behavior apparent from Figure 23 is the high percentage of trips destined for Downtown Portland (36%), other Central City districts (14%), and the Northwest Industrial District (6%). The majority of trips are to destinations that have good transit connections with Hillsdale.

An analysis of trips destined for Hillsdale reveals that the 15% of the trips originate in the largely residential zone directly west of the center. The overwhelming majority of trips to Hillsdale come from the southwest part of the region. Many of these areas do not have a good transit connection with Hillsdale.

Figure 1-22: Geographic Distribution of Trips Originating in Hillsdale Town Center

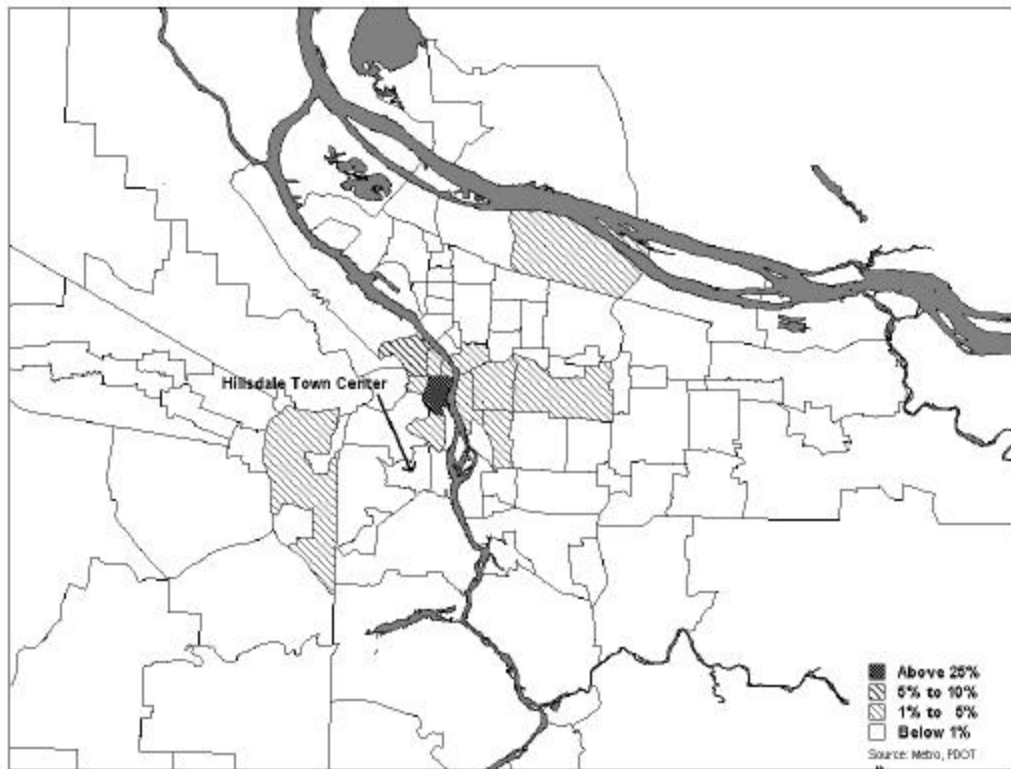
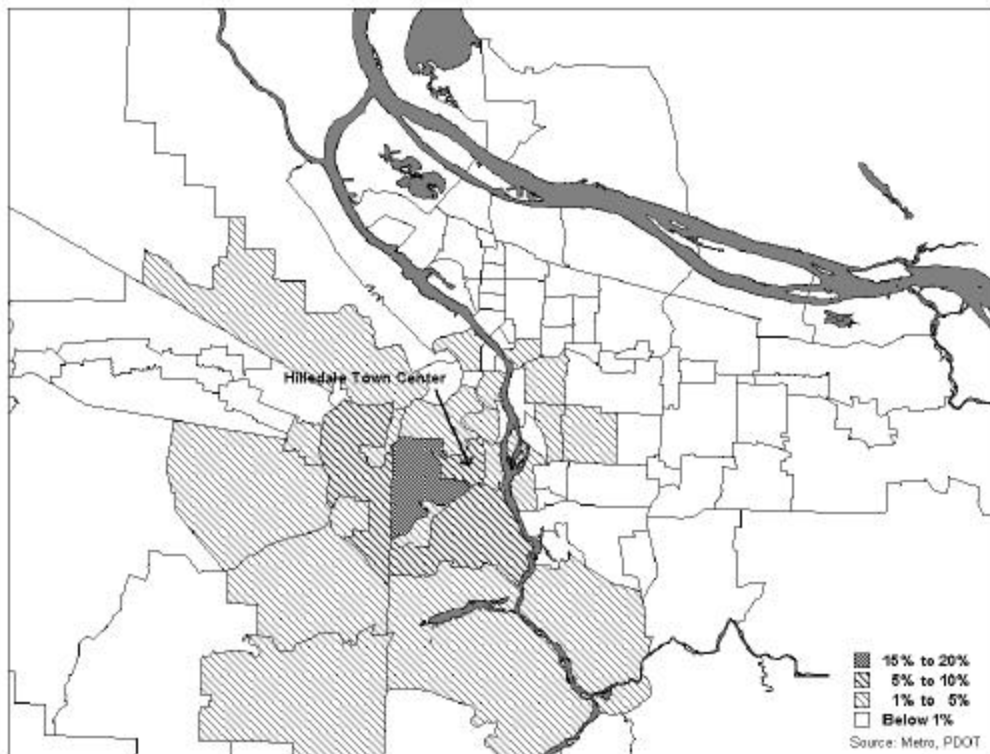


Figure 1-23: Geographic Distribution of Trips Coming To Hillsdale Town Center



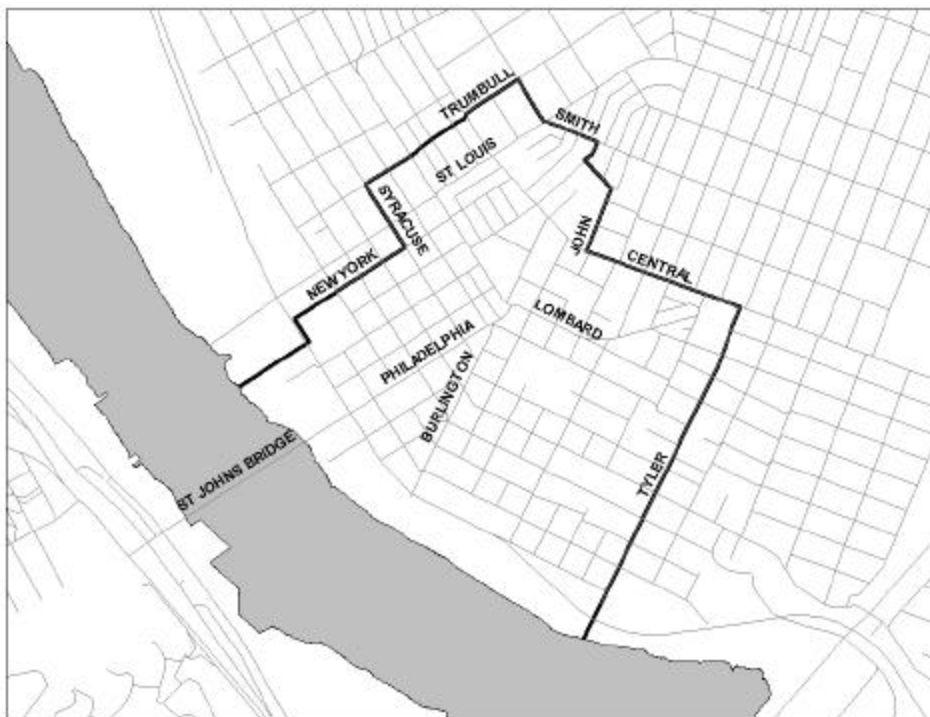
Case Study 2 St. Johns Town Center

Study Area Profile

Location

St. Johns Town Center is located on the North Portland peninsula. It is bounded on the southwest by the Willamette River, N Tyler to the southeast, N Smith/N John/N Central to the northeast; and by N Trumbull/N Syracuse/N New York to the northwest. St Johns Town Center is included in the Cathedral Park and St. Johns neighborhood association boundaries. The study area is approximately 343 acres.

Figure 2-1: St. Johns Town Center Vicinity Map

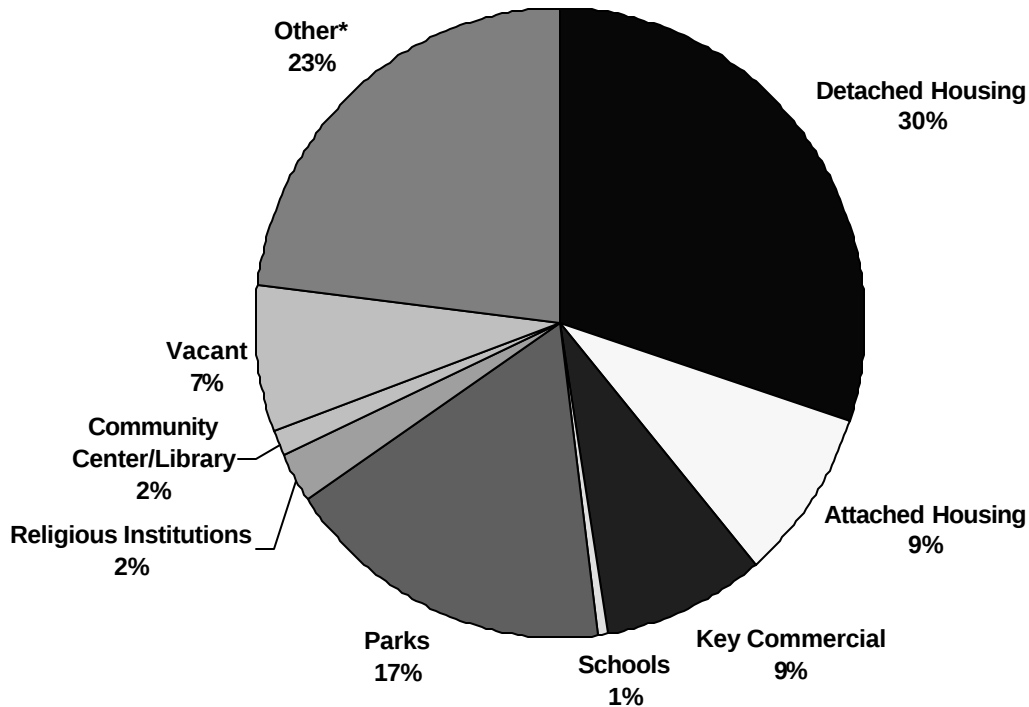


Land Use

Current Land Use Pattern

Figure 2-2 shows the land use distribution for the St. Johns Town Center. The development of this center began in 1865 with the filing of the first plat. The center is one of the most “mature” centers in the City. Its long history is evident in its urban form and diversity of land use activities.

Figure 2-2: St. Johns Town Center Land Use Distribution



* Other category includes Vehicle Services, Industrial uses, Commercial and Retail uses not identified as key commercial, and Institutional Uses excluding schools, civic uses, and religious uses.

Residential land uses comprise less than half of the total land area in the center. There are 486 single-family detached units (39%) and 775 attached units (61%).

The central commercial district runs along N. Lombard and N. Philadelphia, extending out several blocks on either side. Table 2-1 shows the distribution of key commercial activities. The center has a significant quantity and mix of commercial establishments.

Table 2-1: Distribution of Key Commercial Activities in St. Johns Town Center

Key Commercial Categories	Number of Establishments
Grocery	10
Drug Store	1
Restaurant	16
Personal Services	18
Retail Goods	28
Professional Services	12

The center has approximately 90 commercial structures. Because St. Johns' commercial district developed around streetcar service, not the auto, the majority of structures (70%) were built in a transit and pedestrian-friendly design.

The 1996 State employment figures show employment of approximately 1493 workers. While the commercial district is one source of employment in the area, the other source is the industrial district located roughly between N. Decatur and the Willamette River. Of the total employers in the center, two are subject to Eco-rule requirements.

Zoning

Figure 2-3 shows the current zoning pattern for St. Johns Town Center.

Figure 2-3: St. Johns Town Center Zoning



This area has not been involved in a recent community planning effort. The City of Portland's Bureau of Planning anticipates a planning study for St. Johns in the near future that looks at ways to implement the town center and main street vision for this area.

Parks and Open Space

St. Johns Town Center has three significant parks and open space areas. Cathedral Park lies under the St. Johns Bridge and along the Willamette River bank. Recently acquired open space is located south of Cathedral Park adjacent to the Willamette River. Recreational open space is adjacent to the St. Johns Community Center. The town center also has a community garden.

Community and Municipal Facilities

There are a number of civic and community facilities located in the town center. The St. Johns Community Center and St. Johns Racquet Center offer recreational opportunities for the North Portland community. James John Elementary School and the St. Johns Library are located within the center. St. Johns Town Center is the location of the North Police Precinct and Fire Station No. 22.

Circulation

The topography and history have determined the physical layout of St. Johns Town Center. The Town Center is located on the North Portland peninsula, on the north bank of the Willamette River. The first plat for St. Johns dates back to 1865. Over time, the area developed on a small block grid pattern more conducive to walking and transit. The average length between street connections is 572 feet.

The St. Johns Bridge, opened in June 1931, connects the North Portland peninsula with U.S. 30, a regional highway. The bridgehead links to N. Philadelphia, which connects into the heart of the town center. The existence of the bridge has been both a benefit and a detriment to the St. Johns area. While the bridge provides a good regional connection it also draws auto and truck traffic into the town center, reducing community livability. Currently, the St. Johns Truck Study is evaluating strategies to reduce the negative impact of the truck traffic in the area while facilitating freight movement. The study is scheduled for completion in Spring of 2000.

Traffic

Figure 2-4 shows the street classifications for traffic streets in the St. Johns Town Center. N. Lombard is the primary east-west connection to and from the center. N. Fessenden and N. Willamette Blvd. also provide connections from the east. As previously discussed, N. Philadelphia and the St. Johns Bridge provide access to locations on the south bank of the Willamette for the entire peninsula.

The map displays the St. Johns Study Area, which is outlined by a thick black line. Major city traffic streets are shown as solid black lines, including Lombard, St. Louis, N. 1st, Philadelphia, and the St. Johns Bridge. District collectors are represented by thin solid lines, and neighborhood collectors are shown as dashed lines, including Fessenden, Richmond, and Willamette. The map also shows the river and the surrounding urban grid.

Legend:

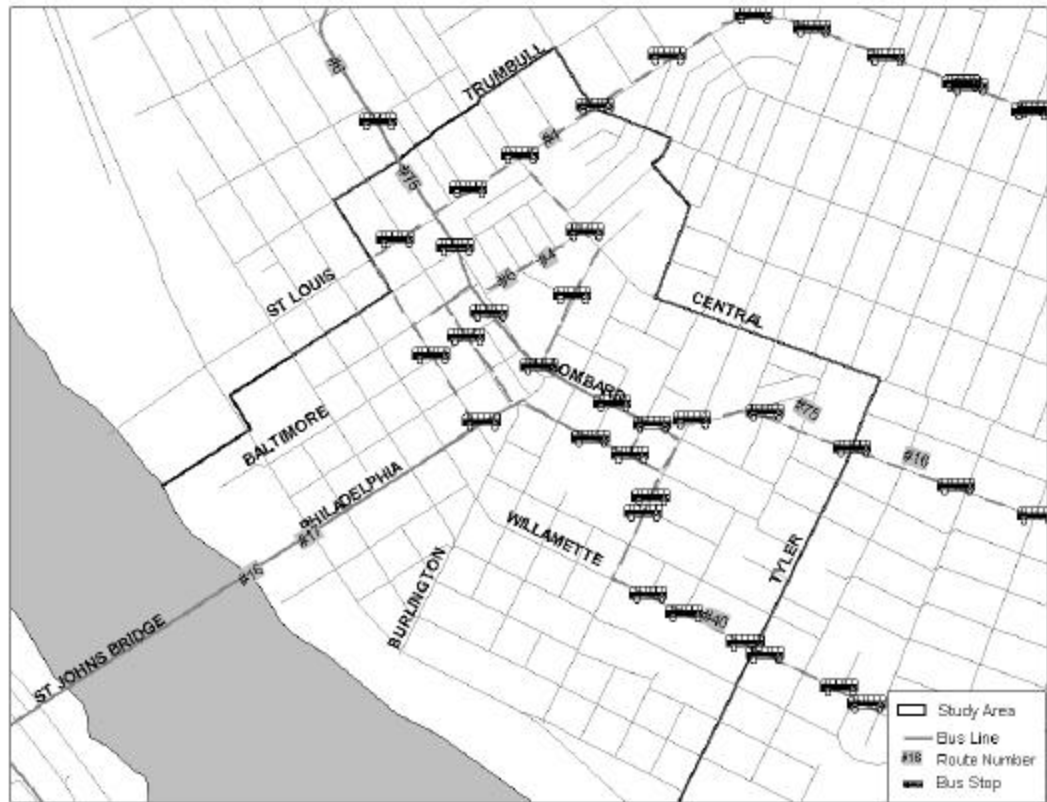
- St. Johns Study Area
- Major City Traffic Street
- District Collector
- Neighborhood Collector

Figure 2-5 shows the traffic volumes of streets in the St. Johns Town Center. The collector streets that feed the St. Johns Bridge show the highest volumes.

Transit Service

St. Johns Town Center currently has a high level of bus service connecting it to downtown Portland, Rivergate, Swan Island and other employment centers. As the northernmost town center in the Portland Metropolitan Area, St. Johns is the origin location or final destination for many of its bus routes. Route #4 connects St. Johns to Downtown Portland through North Portland. It is routed along a number of major attractions including University of Portland, PCC Cascade, Emanuel Hospital and the Rose Quarter. It provides service between 5:15am and 2:15am at 12-minute headways during the peak hours and 15-minute headways at mid-day.

Figure 2-6: Town Center Transit Service



Route #6 service to St. Johns is a special extension of the route's regular service along NE Martin Luther King Blvd. Service is extended to St. Johns by way of Marine Drive and the industrial facilities located along its route. Service is only offered in the morning peak hour and at a less frequent level in the evening. Morning service begins at approximately 540am at 30-minute headways until 8:30am. Service resumes at 3:00pm and continues at 30-minute headways until 6:00pm.

Route #16 connects St. Johns to downtown Portland by way of the St. Johns Bridge and Front Avenue. It supplies morning and evening commuter service only. Service is offered between 6:00am and 8:00am and between 3:00pm and 6:30pm at 30-minute headways.

Route #17 connects both St Johns and Sauvie Island to downtown Portland with stops in the NW Industrial district and NW 21st avenue, a dense housing and retail center. Daily

Service begins at approximately 5:00am and is offered until midnight. Service is provided at 30-minute headways during the day and hourly after 6:00pm.

Route #40 originates at Pier Park to the northwest of the study area, proceeds through the business district along N Lombard then departs the study area along N. Willamette Blvd. It then connects St. Johns to the Rose Quarter and downtown along N Vancouver and N Williams. Service is furnished between 5:30am and 10:00pm at 30 minute intervals.

Route #75 runs from St. Johns to the City of Milwaukie. It runs east from the town center along N Lombard and NE Columbia and then south along 38th Avenue. Service is provided from 5:00am till 12:40am at 15-minute headways.

Pedestrians

Figure 2-7 provides a map of the pedestrian street classifications for the St. Johns Town Center. Most of the town center's commercial district is classified as a Pedestrian District. Within the Pedestrian District, nearly all of the streets are improved with sidewalks. Overall, more than half (60%) of the streets in the center have sidewalks along both sides of the street. The unimproved streets, for the most part, are found in the blocks nearest to the river.

Figure 2-7: St. Johns Town Center Pedestrian Street Classifications

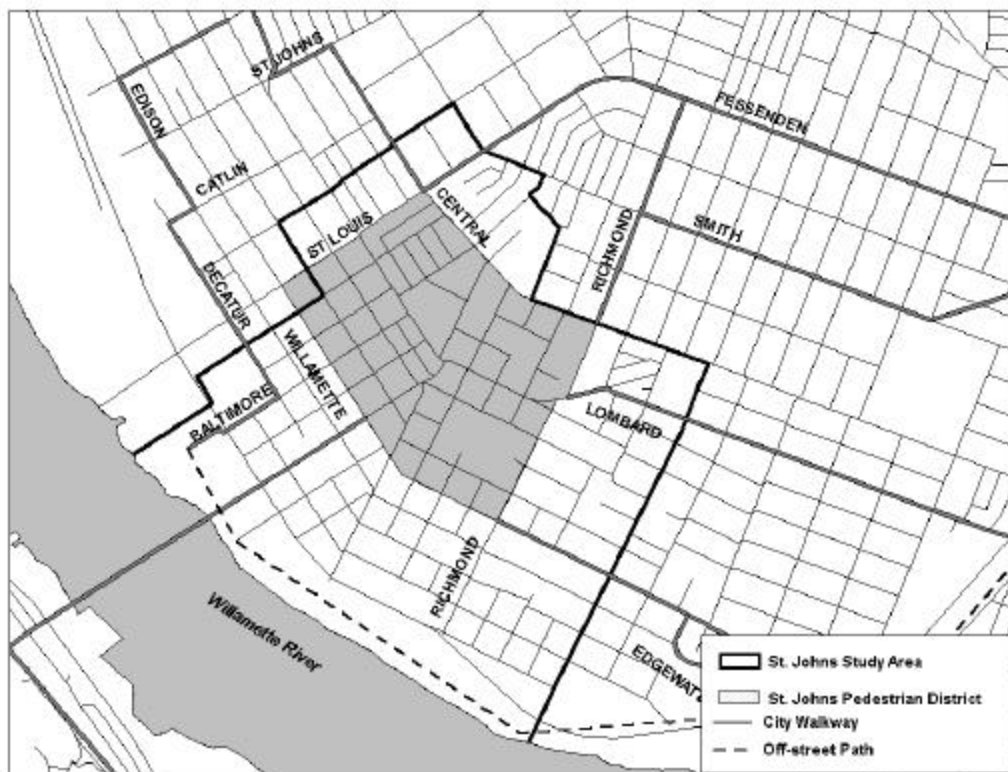
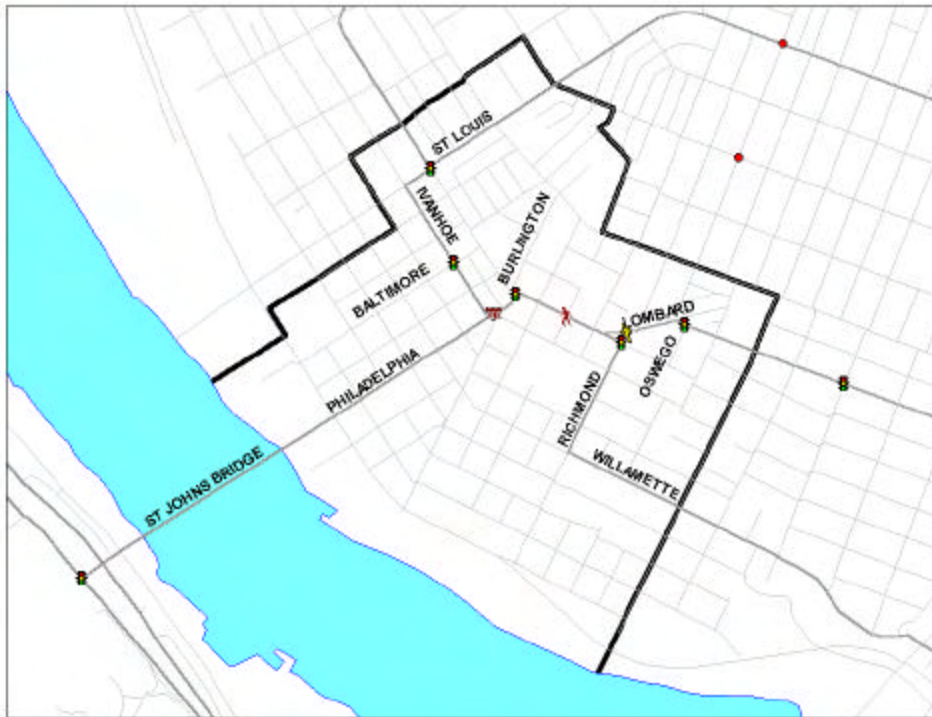


Figure 2-8 shows the location of traffic signals. The majority of signals are located at intersections along N. Lombard and average two-block spacing south of N. Burlington. Only one signalized pedestrian crossing is available on St. Louis, at the intersection with N. Lombard, although St. Louis carries significant truck traffic.

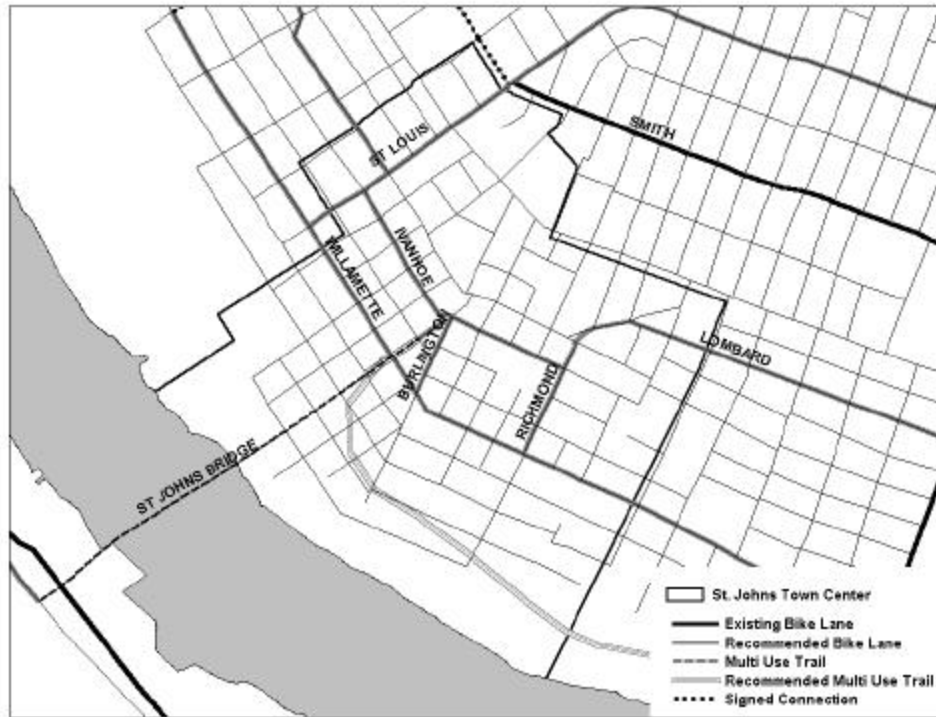
Figure 2-8: St. Johns Town Center Traffic Signals



Bicycles

Figure 2-9 shows the bicycle network serving the St. Johns Town Center. Although the center has a network of identified bike routes, lane striping has not been put in place on most routes.

Figure 2-9: St. Johns Bicycle Network

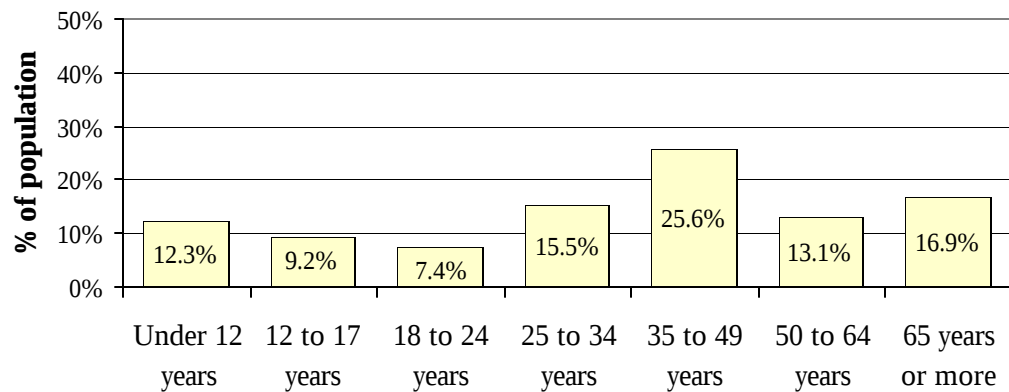


Population and Household Characteristics³

Age Distribution

As of 1996, the ages of the population in the Town Center are distributed fairly evenly, with the exception of the 35-49 age group, which represented a relatively high percentage of the population (25.6%). The remaining age groups ranged from 7.4% of the population to 16.9%.

Figure 2-10: Age Distribution

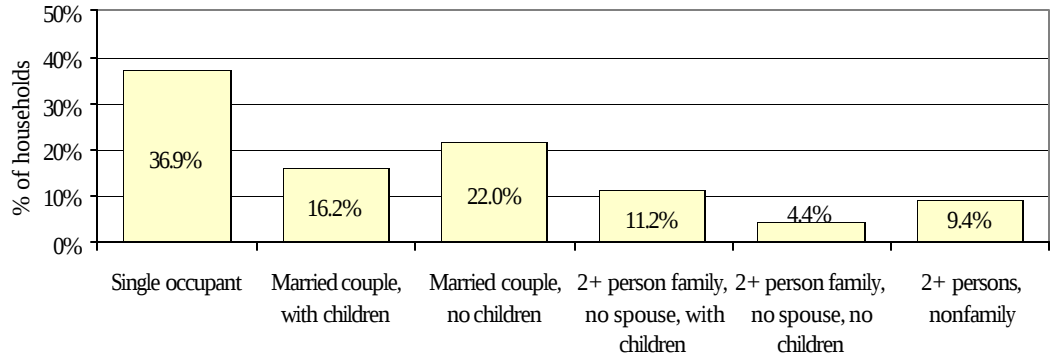


³ Since data is reported on the basis of block groups, the following medians and percentages are based on block group medians and totals.

Household Size and Type

The most common household type in the Town Center area is the single occupant, which represents 36.9% of the total households. The next most common household types are married couples with children (16.2%) and married couples without children (22%). The 3 remaining household types—those with 2 or more persons who are unmarried/unrelated—are relatively underrepresented, with shares ranging from 4.4 to 11.2.

Figure 2-11: Household Size and Type

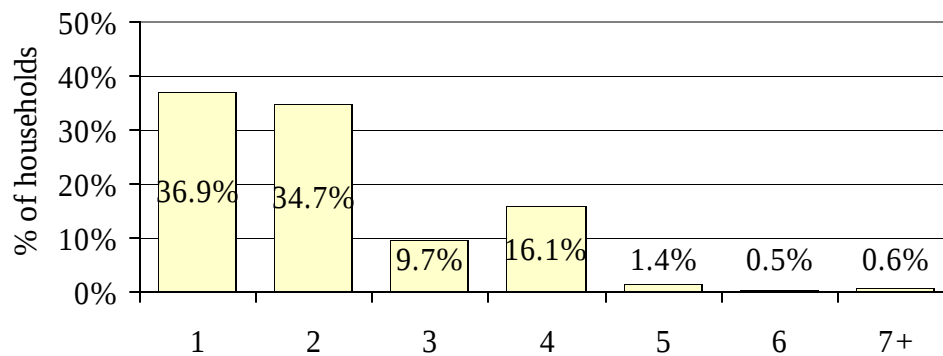


(Source: 1996 American Community Survey)

Persons per Household

The majority of households in the area are made up of only 1 or 2 persons (the combined share is 71.6%). At the other end of the scale, the number of households with more than 4 persons is extremely low (2.5% of the total).

Figure 2-12: Persons per Household

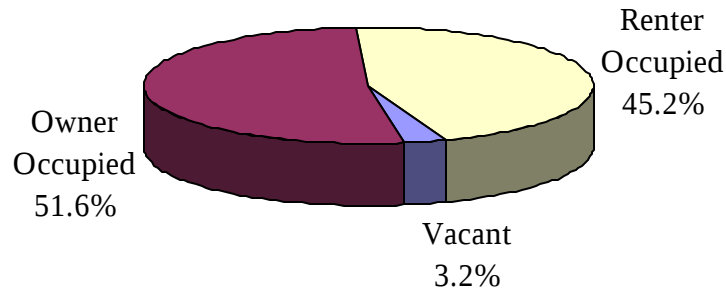


(Source: 1996 American Community Survey)

Tenure and occupancy status

As of 1996, the proportion of owner occupied housing in the Town Center area was just slightly higher than the proportion of renter occupied housing (51.6% compared to 45.2%). About 3 percent of the housing were vacant.

Figure 2-13: Tenure and Occupancy Status

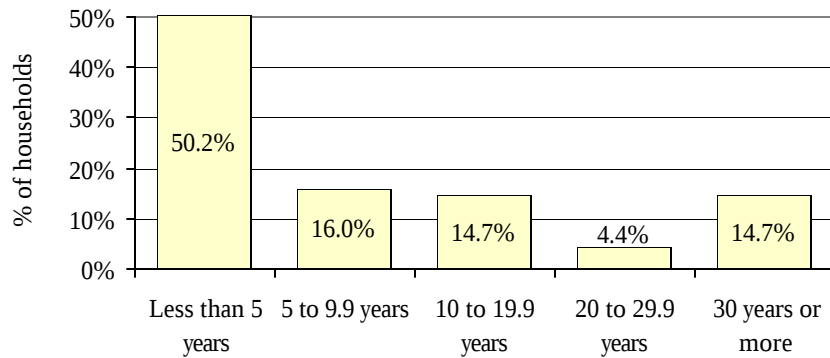


(Source: 1996 American Community Survey)

Length of Residence

The number of new residents to the area (those who moved in less than 5 years before 1996) is an extremely high 50.2 percent. This may be related to the high percentage of renters in the area, who tend to move more often than homeowners do. Fewer than 20% of the households have lived in the area for 20 years or more.

Figure 2-14: Length of Residence

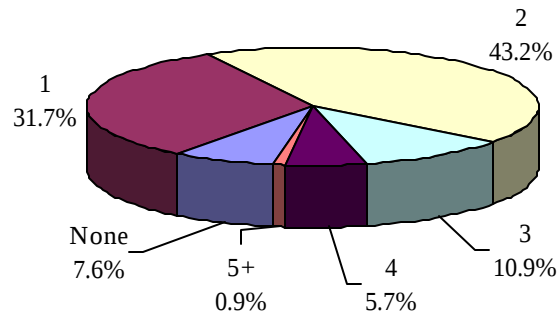


(Source: 1996 American Community Survey)

Vehicle Availability

As of 1996, most households in the Town Center area (74.9%) had 1 or 2 vehicles available for use; 31.7% had one vehicle, 43.2% had two. Only 17.5% of the households had more than 2 vehicles (10.9% had 3; 5.7%, 4; 0.9%, 5 or more). An even smaller share of the households (7.6%) had no vehicle available.

Figure 2-15: Vehicles per Household



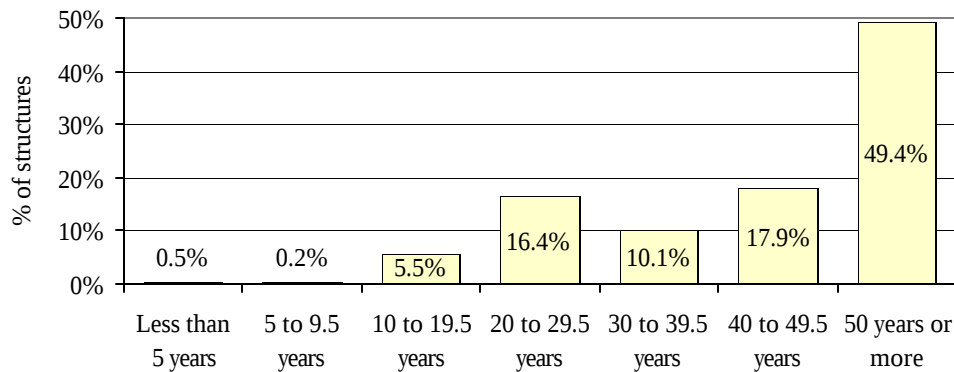
(Source: 1996 American Community Survey)

Housing Characteristics

Age of Housing

Almost half of the housing structures in the Town Center area (49.4%) were built prior to 1946. Another 44.4% of the housing were built between 1946 and 1976. As of 1996, only 10.2% of the housing had been built within the last 20 years.

Figure 2-16: Age of Housing Structure



(Source: 1996 American Community Survey)

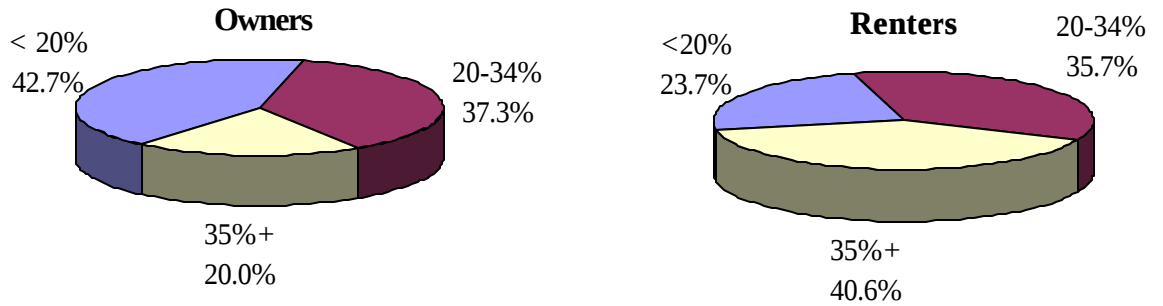
Housing costs

In 1996, according to the American Community Survey, the median house value in the Town Center area was \$83,400. The median contract rent for residential housing was \$404 per month.

Housing costs as a Percentage of Household Income

In 1996, the highest proportion of homeowners in the area (42.7%) spent less than 20% of their household income on housing. Over 37% spend between 20-34% of their income on housing and 20% spend 35% or more of their income. Conversely, the greatest share of renters (40.6%) spend 35% or more of their income on housing, with 35.7% spending 20-34% and 23.7% spending less than 20%.

Figure 2-17: Owner vs. Renter Housing Costs as a Percentage of 1996 Household Income



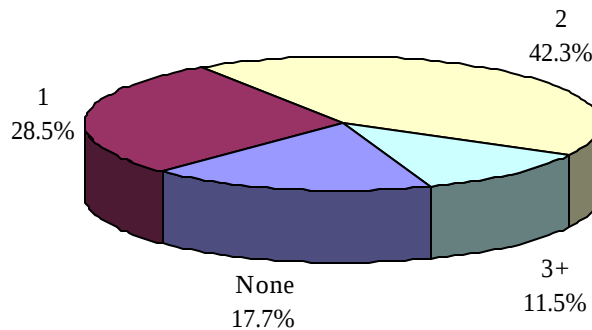
(Source: 1996 American Community Survey)

Employment Characteristics

Workers per Family

The largest share of families in the Town Center area (42.3%) has 2 workers and the second highest share (28.5%) has only one worker per family. Almost 18 percent of the families have no workers, while 11.5 percent have three or more workers.

Figure 2-18: Workers per Family



(Source: 1996 American Community Survey)

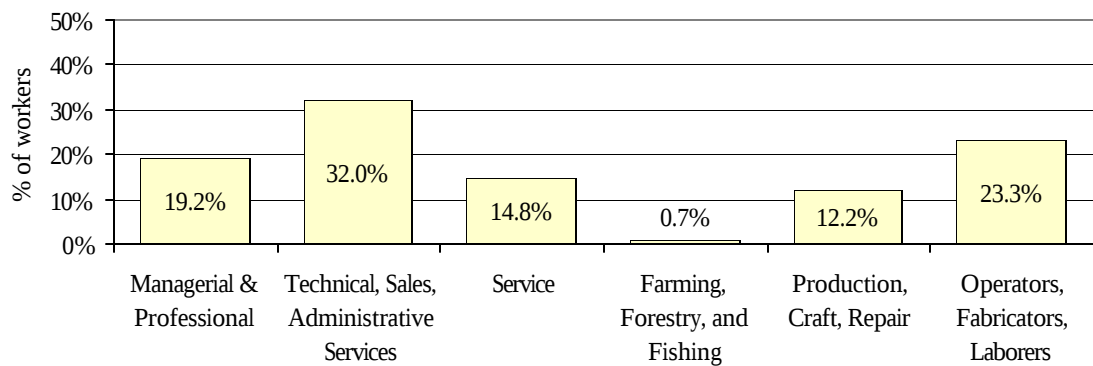
Household Income

According to American Community Survey data, the median 1996 adjusted household income for the Town Center area is \$24,684.

Occupation of Local Workforce

In 1996, the occupations with the highest share of workers from the Town Center area were technical, sales and administrative occupations (32%); operators, fabricators and laborers (23.3%); and managerial and professional occupations (19.2%). Nearly 15% of the workforce worked in service occupations and 12.2% worked in production, craft and repair occupations. Farming, forestry, and fishing employ only 0.7% of the workforce.

Figure 2-19: Occupations

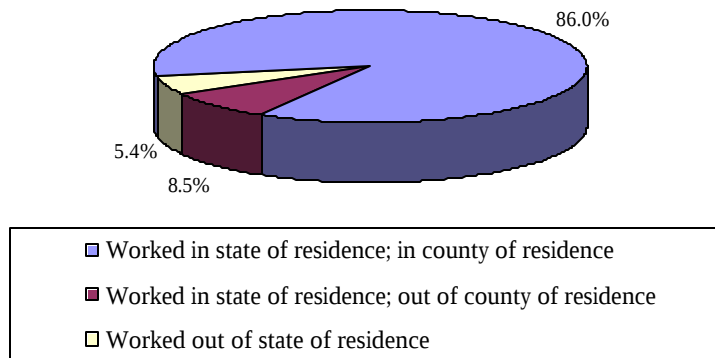


(Source: 1996 American Community Survey)

Place of Work for Area Residents

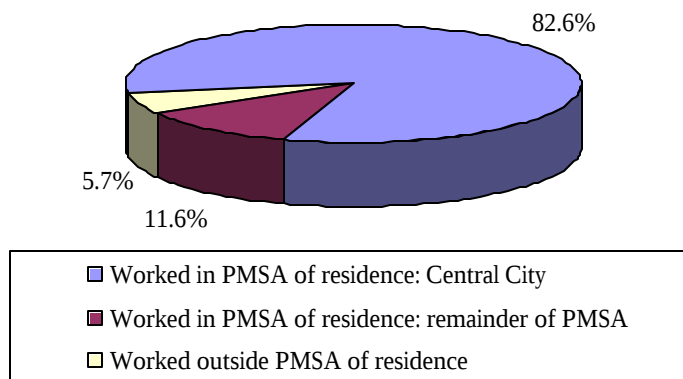
The large majority of residents (86%) worked in Multnomah County, with nearly all of those employed in the City of Portland (82.6%). Only 5.7% commuted outside the Portland metropolitan region.

Figure 2-20: Place of Work: State & County



(Source: 1996 American Community Survey)

Figure 2-21: Place of Work: PMSA



(Source: 1996 American Community Survey)

Descriptor Values

The baseline descriptors' values for the St. Johns Town Center are listed below.

Density

The density descriptors measure the intensity of development in an area. The calculation of density is based on net acreage. The net acreage in the St. Johns Town Center is 216 acres.

- ◆ Single Family Density = 2 dwelling unit per net acre
- ◆ Multi family density = 3 dwelling units per net acre
- ◆ Total residential density = 5 dwelling units per net acre
- ◆ Total employment density = 7 employees per net acre

Diversity

The diversity descriptors measure the mix of uses in an area.

	Number of Uses	% of Total Land Use Area within Center
Detached Residential	486	30%
Attached Residential	775	9%
Key Commercial Activities	85	9%
Schools	1	1%
Community Center/Library	3	2%
Parks and Open Space	2	17%

Design

The design descriptors measure street and building characteristics.

The following descriptors relate to the street design:

- ◆ Intersection density = 9.2 intersections per mile
- ◆ Percentage of street segments with sidewalks along both sides of the street = 60%
- ◆ Percentage of designated bicycle facilities built to date = 19%

Ninety commercial properties commercial were evaluated for transit/pedestrian friendliness. The criteria used to evaluated each property include:

1. Building setback within 25 feet of the transit/pedestrian street.
2. No vehicle parking between the transit/pedestrian street and building.
3. Main entrance to the building oriented to the transit/pedestrian street

- ◆ Percentage of properties meeting three criteria = 70%
- ◆ Percentage of properties meeting two criteria = 9%
- ◆ Percentage of properties meeting one criterion = 16%
- ◆ Percentage of properties meeting none of the criteria = 5%

Transit Service

The transit service descriptors measure the quality of transit service in the area.

- ◆ Number of lines serving the area = 6

Route	Peak Hour Headway	Mid-day Headway	Service Hours
4	12 minutes	15 minutes	21 hours
6	30 minutes	No Service	6 hours
16	30 minutes	No Service	6 hours
17	30 minutes	30 minutes	19 hours
40	30 minutes	30 minutes	15.5 hours
75	15 minutes	15 minutes	20 hours

Transportation Demand Management

The transportation demand management descriptor is a tally of employer TDM programs in the area.

- ◆ Number of employers subject to Eco-rule requirements = 2

Parking

The parking descriptors measure the availability and cost of area parking.

- ◆ Average cost of parking per hour = \$0.00
- ◆ Average off-street parking spaces per 1000sf of commercial use = 2.8 spaces/1000sf

Demographics

The demographic descriptors measure key socio-economic patterns in the area.

- ◆ Median income = \$24,684

◆ Household Size

Number of Persons in Household	Percentage
1 Person	37%
2 Persons	35%
3 Persons	10%
4 Persons	16%
5 Persons	1%
6 Persons	0%
7 or More Persons	1%

◆ Household Workers

Number of Workers in Household	Percentage
0 Workers	18%
1 Worker	28%
2 Workers	42%
3 or More Workers	12%

◆ Vehicle Ownership

Number of Vehicles	Percentage
No Vehicles	7%
1 Vehicle	32%
2 Vehicles	43%
3 Vehicles	11%
4 Vehicles	6%
5 or More Vehicles	1%

Travel Profile

The St. Johns Town Center travel profile is based on 1994 travel behavior data from Metro's transportation analysis zone 97. This zone approximates the St. Johns Town Center boundary.

In 1994, an estimated 50,302 trips had origins or destinations within the area. Of the total trips, 12% were local area and 88% had an origin or destination outside of the zone. Table 2-2 shows the distribution of these trips by purpose. As with the other study areas, the largest percentage (41%) of trips fall into the Home-based Other category. Notable, is the relatively high percentage (25%) of trips in the Non-home-based Non-work category.

Table 2-2: St. Johns Town Center Trip Distribution by Trip Purpose

Trip Purpose	% of Total Person Trips
Home-based Work Trips	17%
Home-based Other Trips	41%
Non-home-based Work Trips	13%
Non-home-based Non-work Trips	25%
College Trips	1%
K-12 School Trips	3%

Table 2-3 shows the distribution of mode splits for each purpose. Predictably, the drive alone category captures the greatest percentage of trips for all modes with the exception of College and School. Notable is the Walk/Bike mode split for Home-based Other trips. This mode split is relatively high (12%) in comparison to other study areas. This reflects both the availability of commercial activities in proximity to housing and quality of the pedestrian environment.

Table 2-3: St. Johns Town Center Mode Split by Trip Purpose

Trip Purpose	Drive Alone	Shared Auto	Transit	Walk & Bike	School Bus
Home-based Work	72%	14%	7%	7%	0%
Home-based Other	55%	30%	3%	12%	0%
Non-home-based Work	63%	35%	1%	1%	0%
Non-home-based Non-work	62%	35%	1%	2%	0%
College	38%	8%	12%	28%	0%
K-12 School	3%	2%	19%	54%	22%

Figures 2-22 and 2-23 show the primary travel patterns between the St. Johns Town Center and other transportation zones in the region. Of the total trips for the area, 54% originate in St. Johns Town Center and 46% come to St. Johns from the other zones. For trips originating in St. Johns, 26% remain within the St. Johns zone, and an additional 22% traveled to the surrounding largely residential zone. The majority of trips occurred within the North Portland peninsula. As for trips coming to St. Johns, 31% come from the zone immediately northeast and 22% originate in St. Johns.

Figure 2-22: Geographic Distribution of Trips Originating in St. Johns Town Center

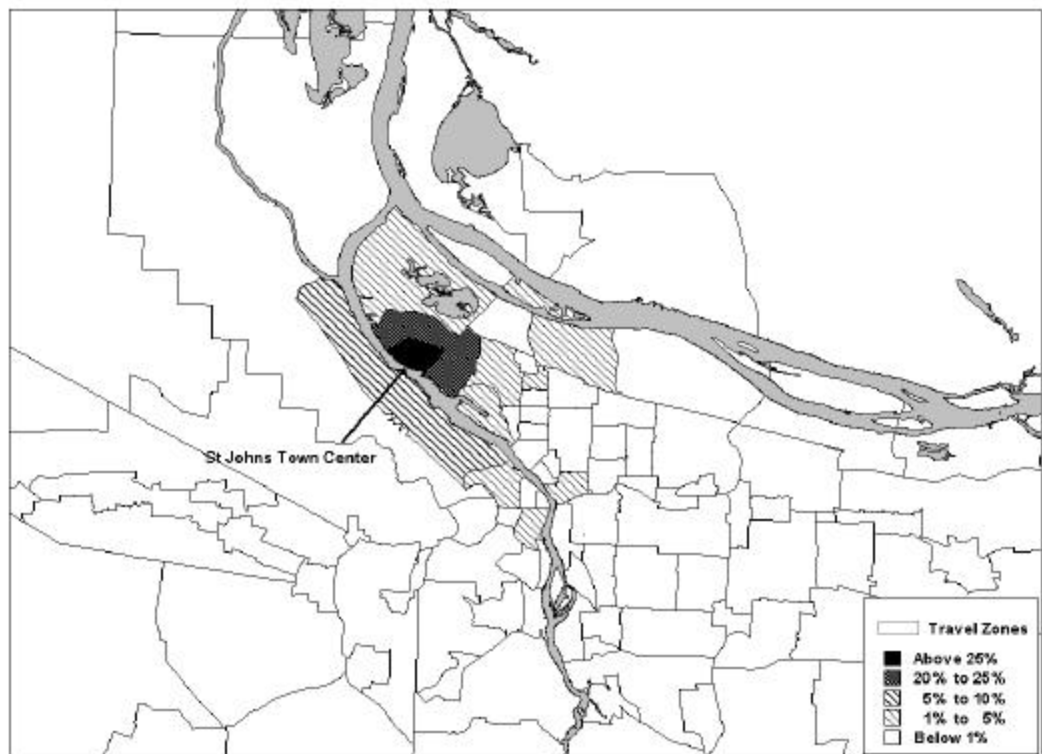
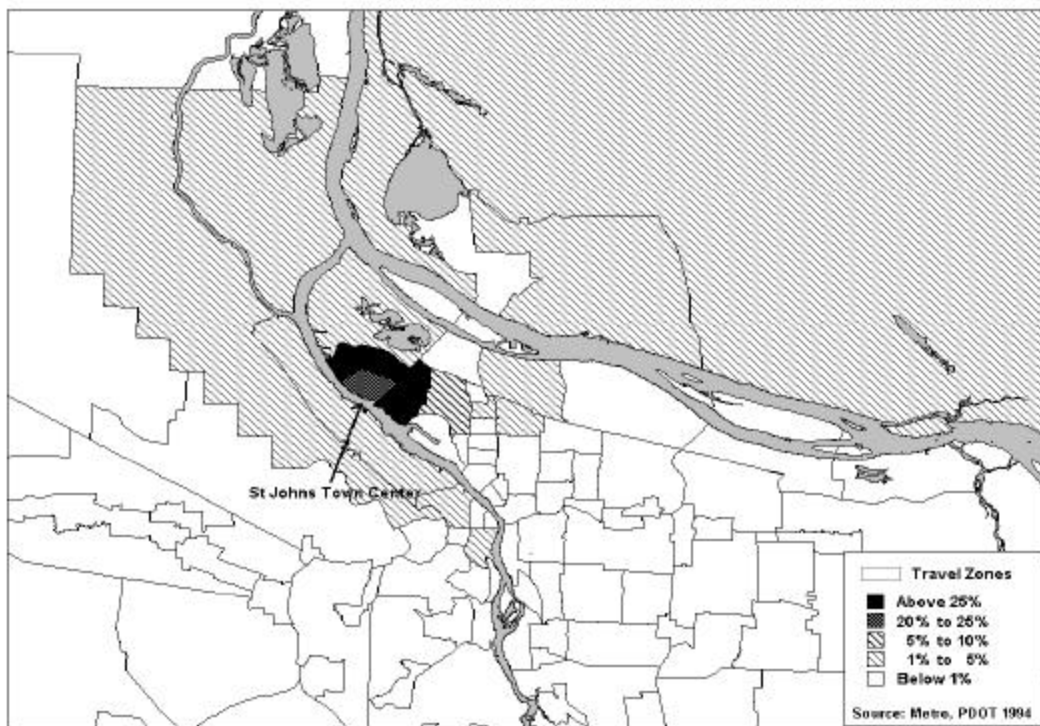


Figure 2-23: Geographic Distribution of Trips Destined for St. Johns Town Center



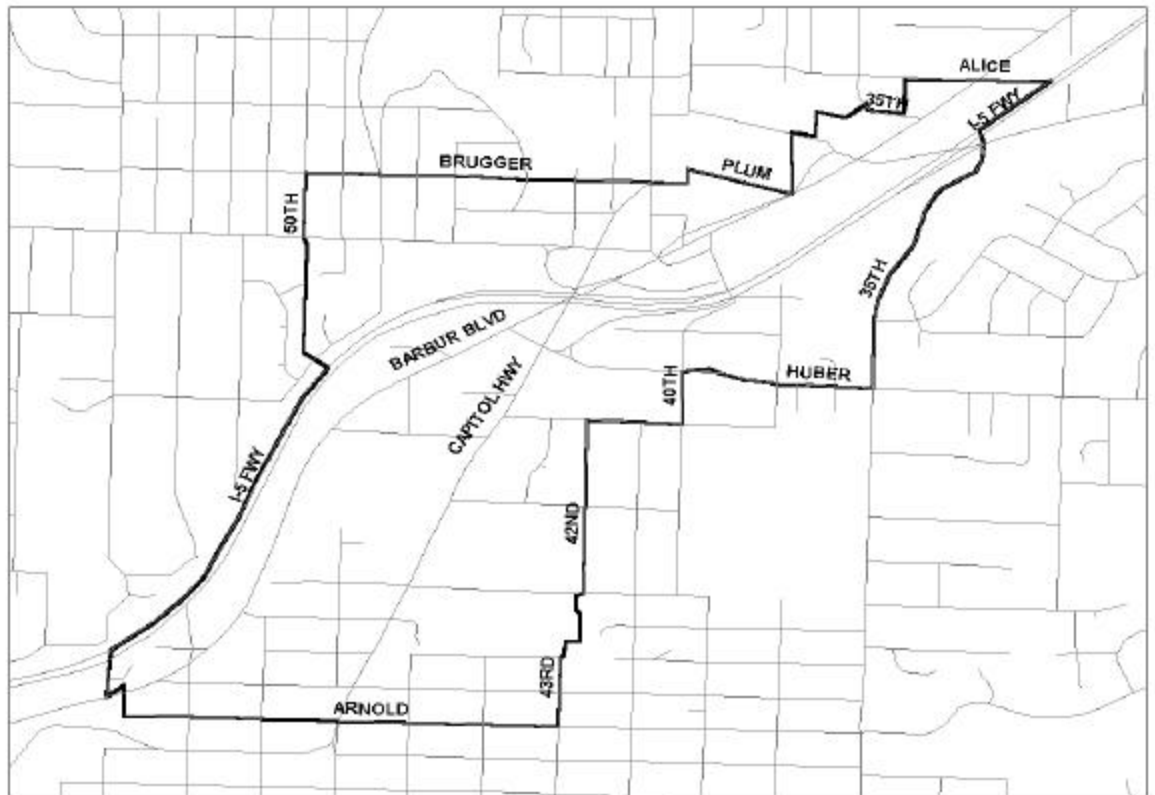
Case Study 3 West Portland Town Center

Study Area Profile

Location

West Portland Town Center is located in Southwest Portland, in the area surrounding the intersection of Capitol Highway and Barbur Blvd. The study area is bounded by SW Brugger/SW Alice to the north; SW Arnold to the south; SW 35th to the east; and SW 50th/Interstate 5 to the west. There are approximately 323 acres within the town center. The town center lies in portions of the Crestwood, West Portland Park, Multnomah, and Ashcreek neighborhoods.

Figure 3-1: West Portland Town Center Vicinity Map

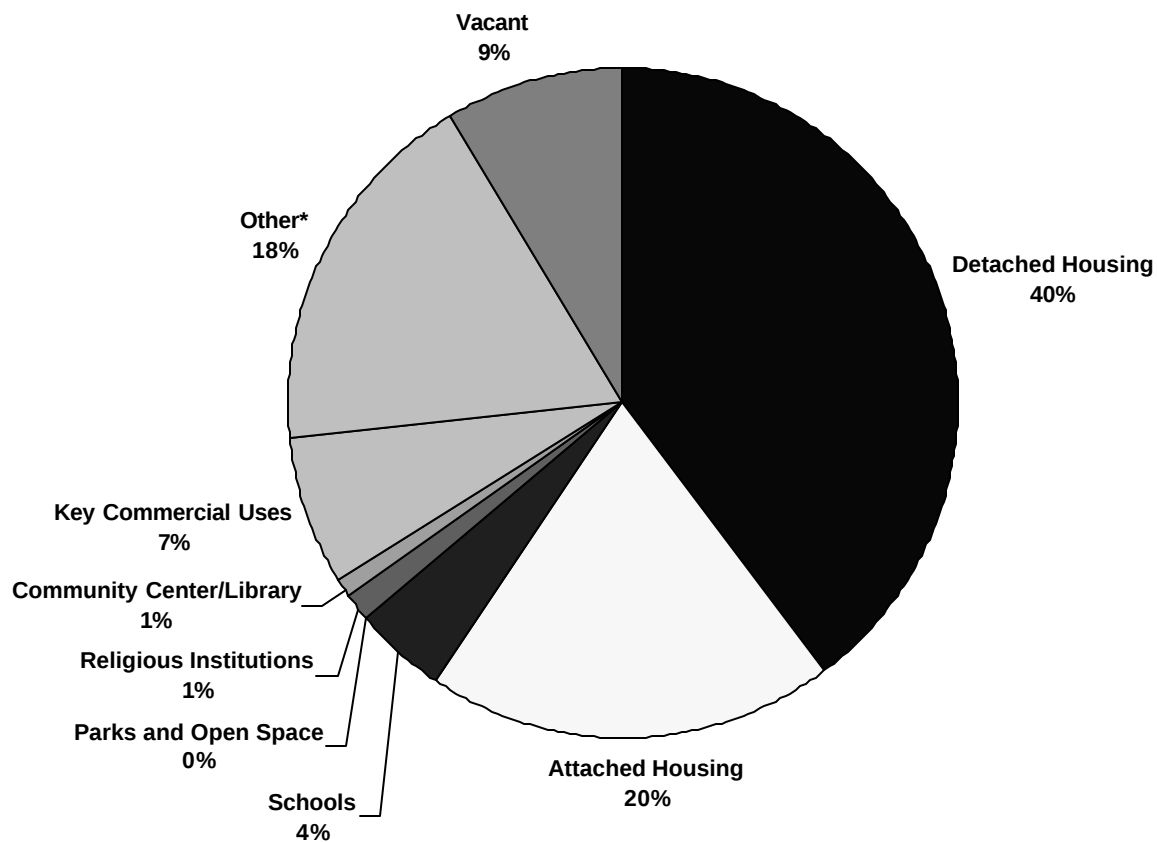


Land Use

Current Land Use Pattern

Figure 3-2 charts the land use distribution for West Portland Town Center. Housing makes up the largest percentage of land use (60%). There are approximately 1,339 housing units in the town center. Of these, 28% are detached single family units, and 72% are attached units – a mix of townhomes and apartments.

Figure 3-2: West Portland Town Center Land Use Distribution



* Other category includes Vehicle Services, Industrial uses, Commercial and Retail uses not identified as key commercial, and Institutional Uses excluding schools, civic uses, and religious uses.

The town center's commercial district runs along SW Barbur. The intersection of SW Capitol Hwy and SW Barbur functions as the center of the commercial district. A smaller commercial node occurs at the intersection of SW Capitol Hwy and SW Pomona. Table 3-1 shows the mix and quantity of key commercial activities located in the center.

Table 3-1: Distribution of Key Commercial Activities in West Portland Town Center

Key Commercial Categories	Number of Establishments
Grocery	3
Drug Store	0
Restaurant	14
Personal Services	8
Retail Goods	8
Professional Services	5

There are approximately 56 commercial structures in the town center. A design evaluation showed that only 29% of the structures exhibited pedestrian/transit-friendly design, including building orientation, setback, and off-street parking placement.

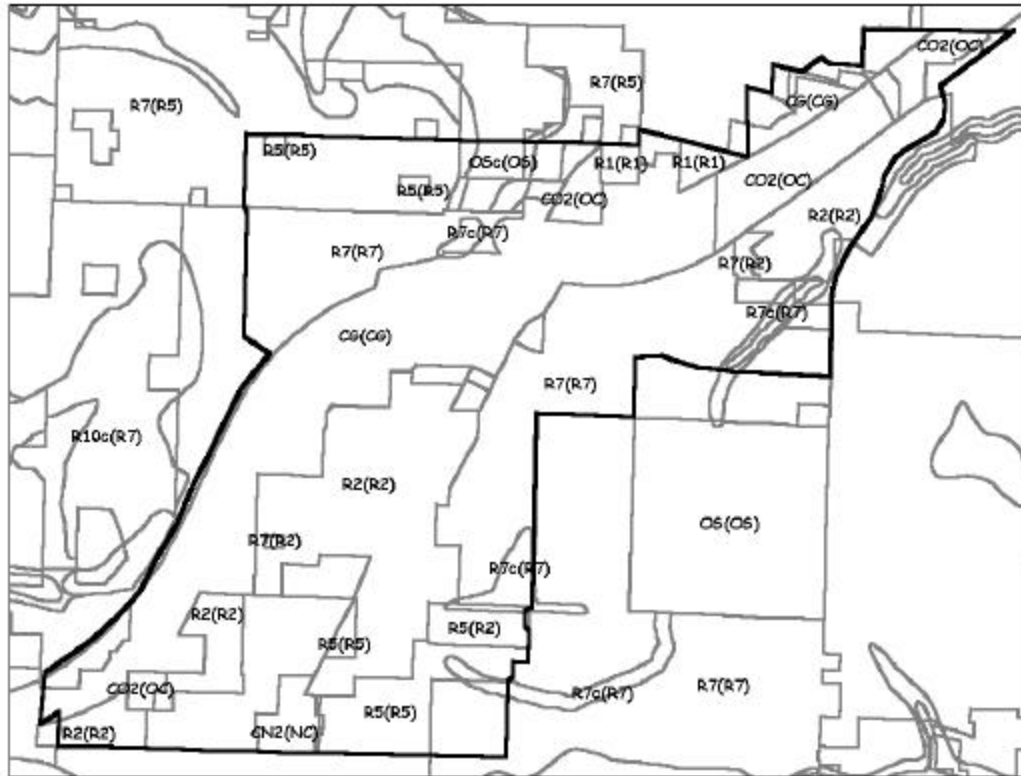
In 1996, approximately 3,068 employees worked in the West Portland Town Center. This figure is indicative of a number of office buildings in the center, as well as retail and civic uses. Two employers in the town center are subject to Eco-rule requirements.

Zoning

Figure 3-3 shows the current zoning found in the West Portland Town Center. The commercial district, along SW Barbur and portions of SW Capitol Hwy, is zoned for General Commercial (CG) and Office Commercial (OC). The CG zone allows for auto-accommodating uses and the OC zone is intended for low to medium intensity office development. Residential zoning is primarily low-density single-dwelling zones, which includes R7 and R5, with maximum densities of 6.2 units per acre and 8.7 units per acre, respectively. Some medium density residential, R1 and R2 can be found in pockets along SW Barbur and SW Capitol Hwy. The R1 zone allows up to 43 units per acre, and the R1, up to 21.8 units per acres.

The town center is included in the Southwest Community Plan district. The plan has not been completed and, currently, the planning process is inactive. Should the plan be completed, some zoning designations may be changed to more adequately reflect the desired urban form of a town center.

Figure 3-3: West Portland Town Center Zoning



Parks and Open Space

The southern edge of Woods Creek Park lies in the West Portland Town Center. The park is approximately 32 acres of wooded open space. Athletic fields are available at the local elementary and middle schools.

Community and Municipal Facilities

The West Portland Town Center is the location of Markham Elementary School and the Capitol Hill Public Library, both on SW Capitol Hwy. Jackson Middle School is just outside the town center boundary on SW 35th. The Barbur Transit Center and 396 space park and ride lot are the focus of transit service for the town center. The Sylvan campus of the Portland Community College system is located just south of the town center.

Circulation

In 1997, the West Portland Town Center was the subject of a previous Transportation Growth Management (TGM) funded study. The TGM study developed alternative land use scenarios and associated transportation improvements that support the town center designation. The recommended actions were carried over into the Southwest Community Plan planning process. As previously discussed, the Southwest Community Plan is not currently active. This study incorporates the previous findings into its analysis and recommendations.

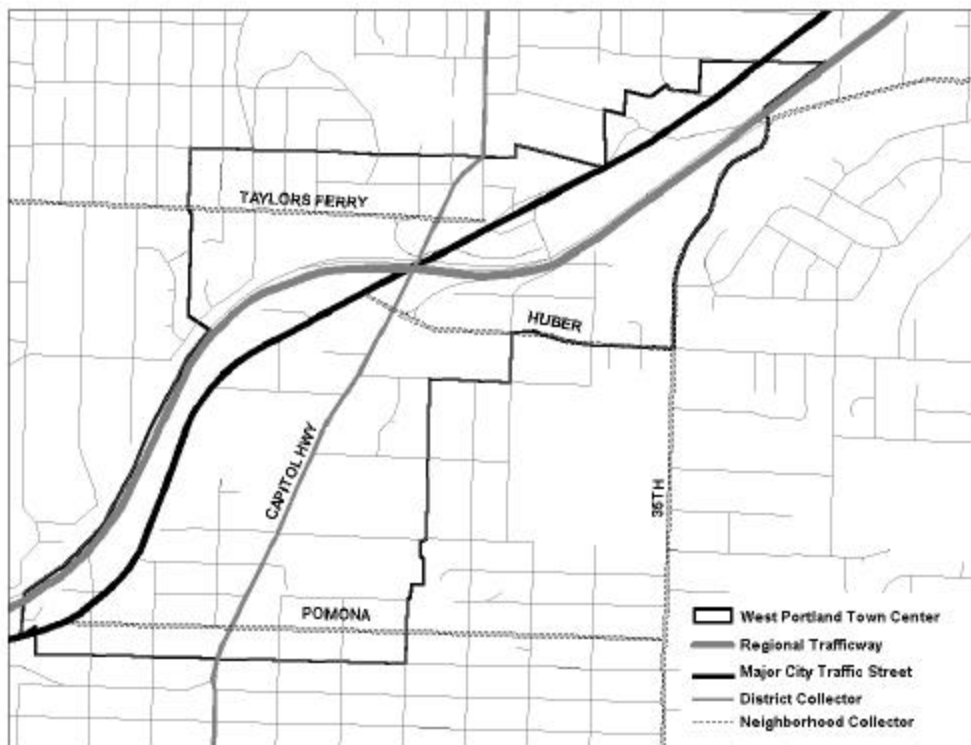
The physical layout of the town center is limited by topographic constraints and the barrier created by I-5 freeway, and to a lesser extent SW Barbur. Street connectivity is generally

poor due to the presence of environmental zoning and the freeway, both of which limit connections. The average length between street connections is 802 feet.

Traffic

Figure 3-4 displays the traffic street classifications in the West Portland Town Center. The I-5 freeway, a Regional Trafficway, divides the center and acts as a barrier. The only opportunity for vehicles to cross I-5 occurs on SW Capitol Hwy. Additionally, an I-5 interchange is located at the intersection of SW Capitol and SW Barbur. As a result, the town center experiences a high volume of traffic passing through the area in order to access the freeway. SW Barbur Blvd, a Major City Traffic Street, carries both regionally destined traffic and local traffic. It serves as an alternative route to I-5 through Southwest Portland. SW Capitol Hwy, classified as a District Collector, connects West Portland Town Center with Multnomah Village and Hillsdale Town Center.

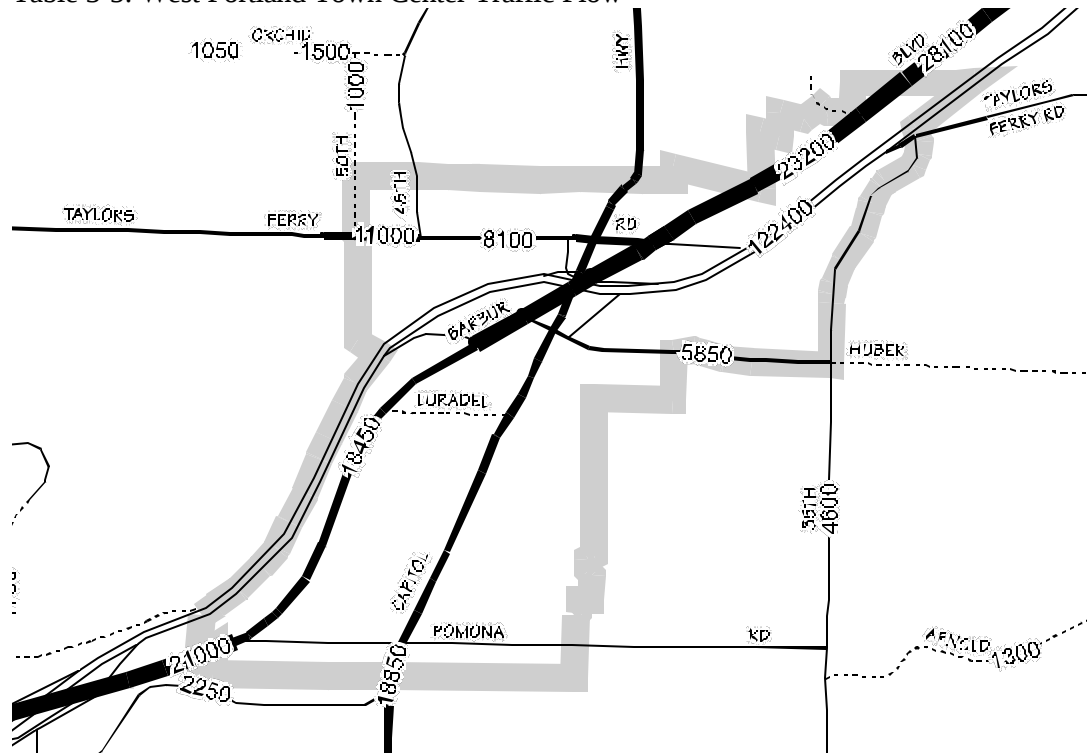
Figure 3-4: West Portland Town Center Street Classifications



Neighborhood Collectors in the area include SW 35th, SW Huber, SW Pomona, and SW Taylors Ferry. Neighborhood Collectors are intended to distribute traffic between Major City Traffic Streets or District Collectors to local streets. The 1997 study found that regionally oriented traffic used the District and Neighborhood Collectors.

Table 3-5 shows the 1996 traffic flow volumes for the primary streets in the West Portland Town Center. As expected, SW Barbur and SW Capitol Hwy carry the greatest volume of vehicle traffic when compared with other surface streets.

Table 3-5: West Portland Town Center Traffic Flow

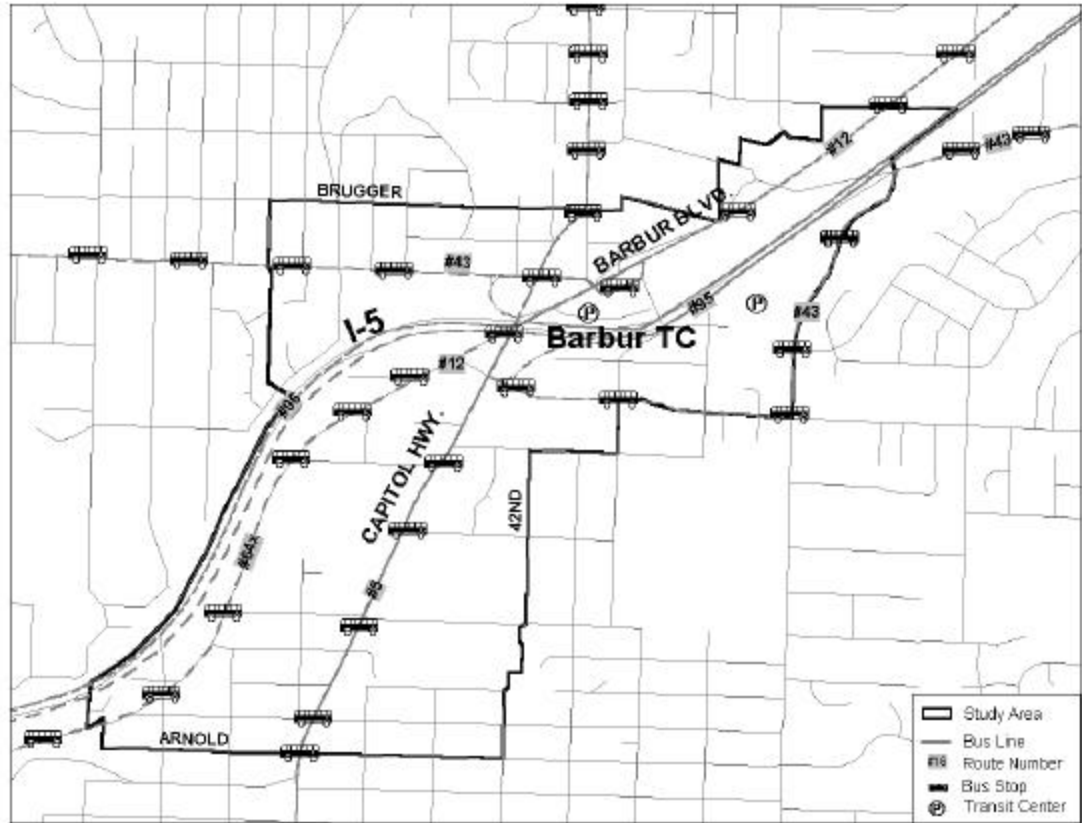


Transit Service

Transit service to the West Portland Town Center is focussed around the Barbur Blvd. Transit Center, which is at the intersection of SW Barbur Blvd., Capitol Highway and Interstate 5. Four Tri-Met routes service this area and stop at the transit center. These routes are #5, #12, #43, and #64x.

Route #5 travels along SW Capitol Hwy from its origin at Portland Community College-Sylvania Campus to downtown Portland. It services the Barbur Transit Center, Multnomah Center and Mittleman Community Center. Service begins at approximately 6:00am and continues until 10:00pm. Peak hour headways average 10 minutes with 13-minute headways the remainder of the day.

Figure 3-6: West Portland Town Center Transit Service



Route #12 originates in downtown Sherwood and travels through King City and Tigard before stopping at the Barbur Transit Center. Service from West Portland continues down Barbur Blvd. to downtown Portland. Route #12 services the transit center beginning at 5:00am and continues until midnight at 10-minute intervals in the peak hour and 13-minute intervals during non-peak periods.

Route #43 Connects Washington Square and points along Taylors Ferry Road, in Johns Landing and in the Lair Hill Neighborhood to downtown Portland. Service to the Barbur Transit Center is provided between 6am and 7pm at 30-minute intervals in the peak hour and hourly service during the day.

The #64X route provides express commuter service between Tigard and Marquam Hill. Service towards Marquam Hill is provided to West Portland stops between 6am and 8am at 30-minute headways. Return service towards Tigard is provided to West Portland every 30 minutes between 4pm and 6pm.

Pedestrians

Figure 3-7 shows those streets classified as City Walkways. An inventory of existing sidewalks in the town center shows that only 6% of street segments have complete sidewalks, defined as continuous and along both sides of the street. Sidewalks along streets designated as City Walkways have not been built, or if built, are discontinuous.

Pedestrian accessibility is difficult in the West Portland Town Center. I-5 creates a barrier. The only crossing opportunities are on SW Capitol Hwy and the pedestrian bridge connecting to the Barbur Transit Center. Additionally, SW Barbur and SW Capitol Hwy both carry a significant volume of traffic. As Figure 3-8 shows, signalized crossings that provide relatively safe access to activities along both sides of these streets are limited and widely spaced.

Figure 3-7: West Portland Town Center Pedestrian Street Classifications

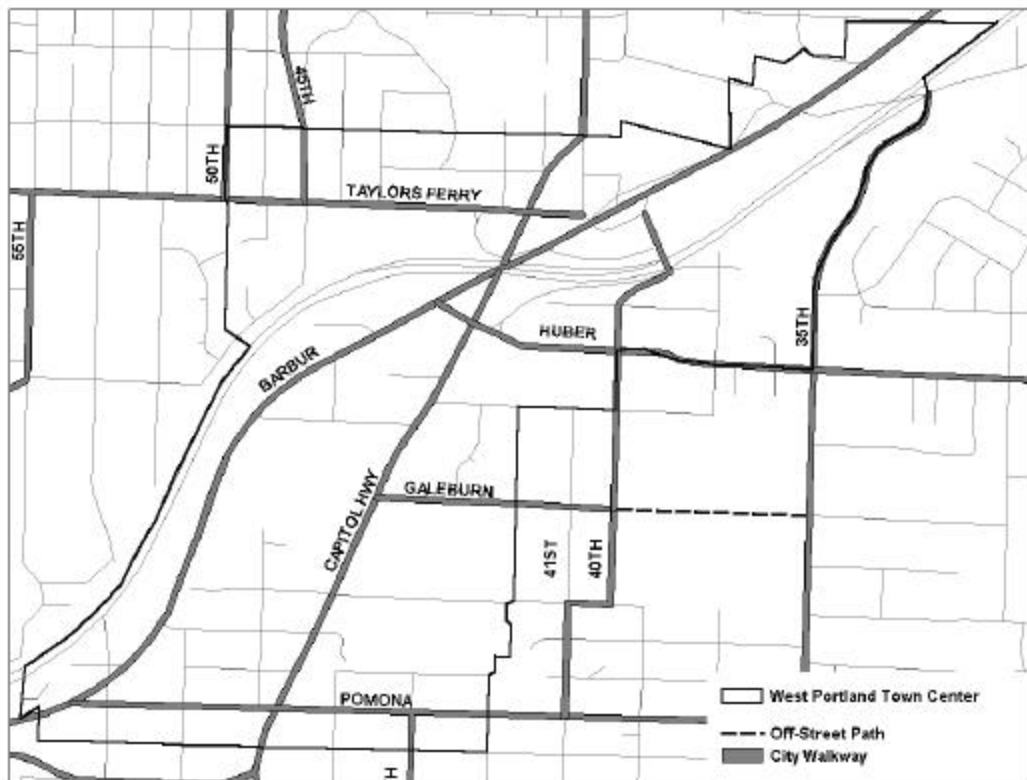


Figure 3-8: West Portland Town Center Traffic Signals

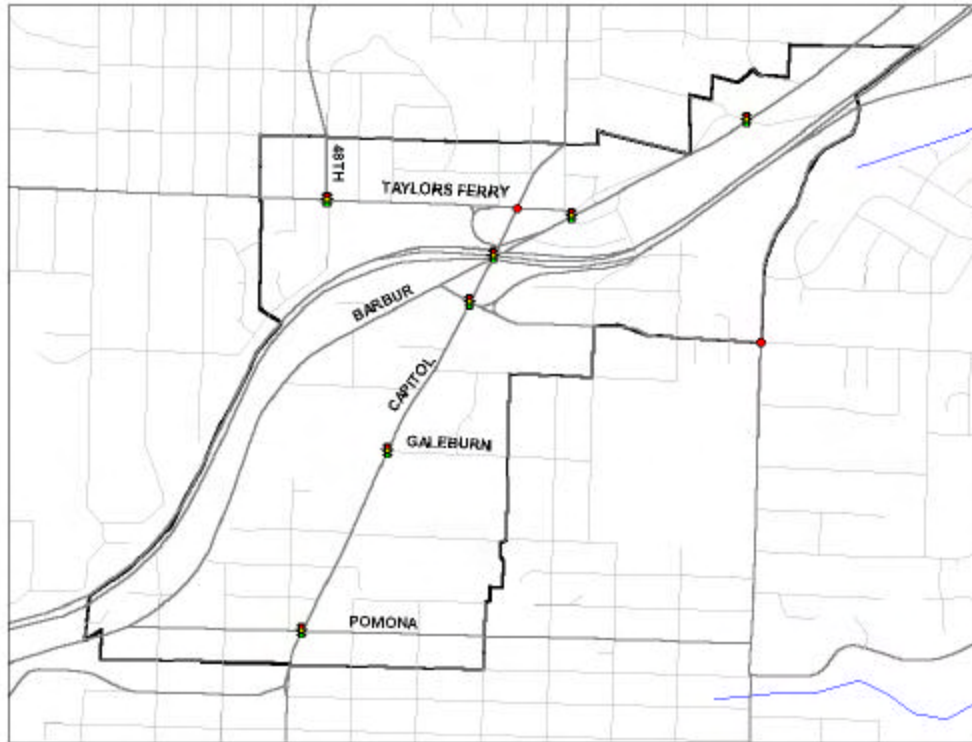
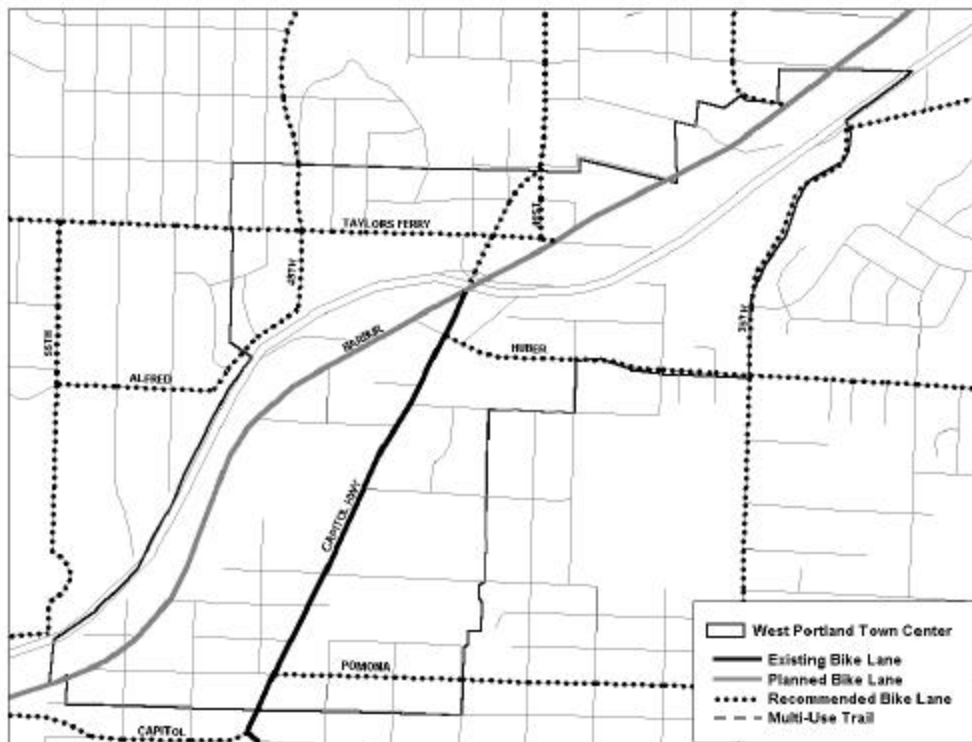


Figure 3-9: West Portland Town Center Bicycle Network



Bicycles

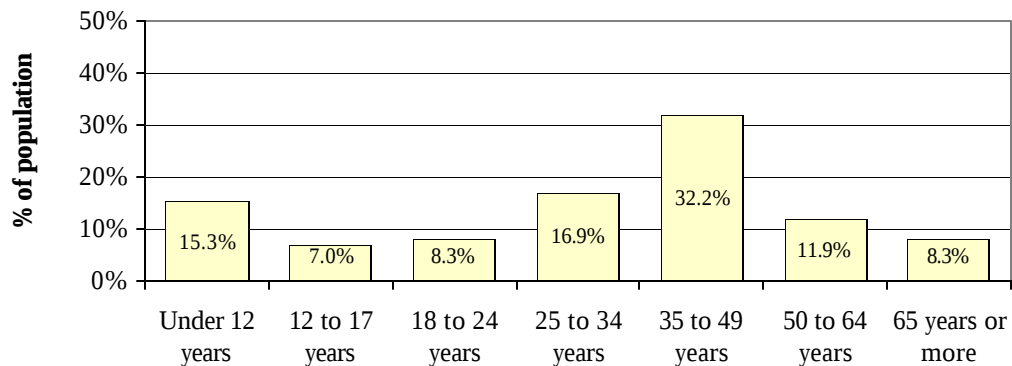
Figure 3-9 maps the bicycle network for the West Portland Town Center. Currently, bicycle lanes are striped on SW Capitol Hwy between SW Barbur and SW Stephenson. The Oregon Department of Transportation is currently constructing bike lanes along SW Barbur Blvd between SW 13th and SW 64th.

Population and Household Characteristics⁴

Age Distribution

As of 1996, the population was distributed fairly evenly across age groups, with the exception of the 33-49 age group, which comprised a relatively high percentage of the population (32.2%). The remaining age groups ranged from 7.0% of the population (12 to 17 years) to 16.9% (25 to 34 years).

Figure 3-10: Age Distribution



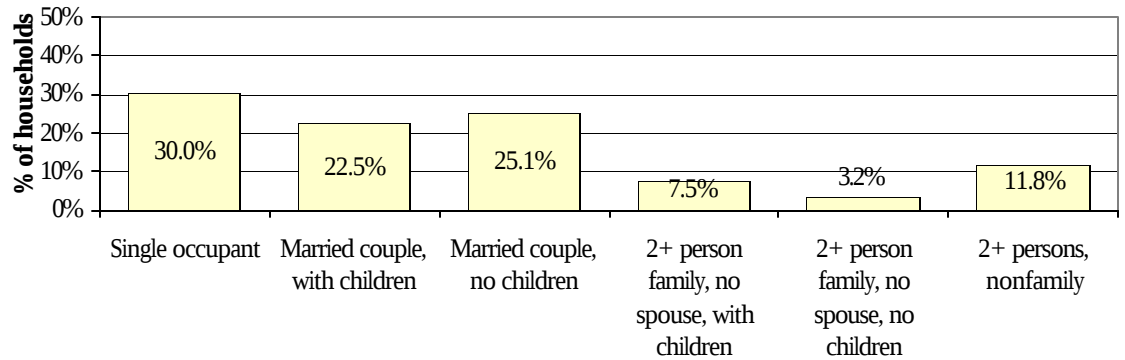
(Source: 1996 American Community Survey)

Household Size and Type

The major household types in the Town Center area are single occupants (30%), married couples without children (25.1%), and married couples with children (22.5%). The next most common type is a non-family household with 2 or more persons, representing 11.8% of the total households. Family households with 2 or more persons and no spouse present, with or without children, are underrepresented.

⁴ Since data is reported on the basis of block groups, the following medians and percentages are based on block group medians and totals.

Figure 3-11: Household Size and Type

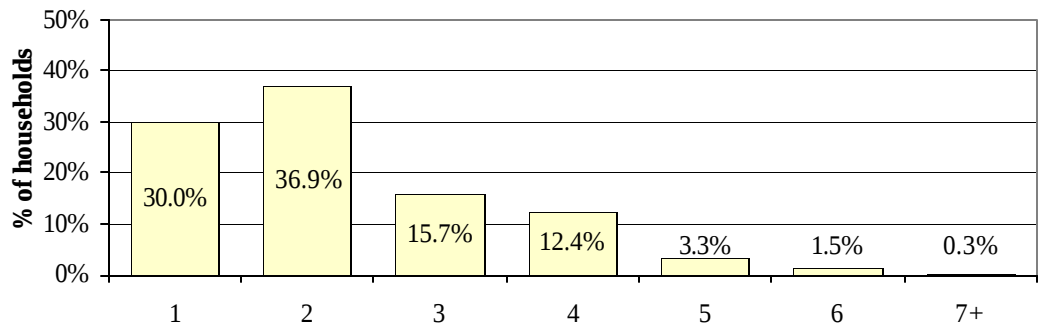


(Source: 1996 American Community Survey)

Persons Per Household

The majority of households in the area are made up of only 1 or 2 persons (with a combined share of 66.9%). The next largest categories are 3 and 4 person households, with 15.7% and 12.4% of the total households, respectively. The number of households with 5 persons or more is extremely low (5.1% of the total).

Figure 3-12: Persons per Household

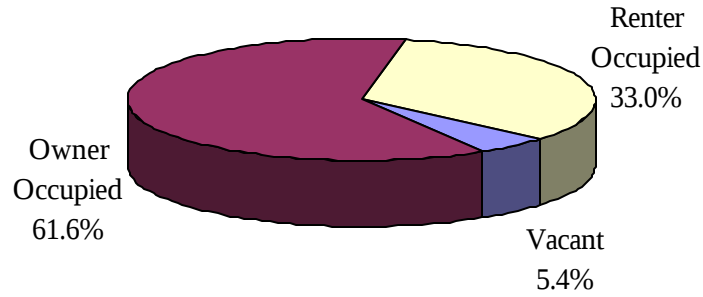


(Source: 1996 American Community Survey)

Tenure and Occupancy Status

As of 1996, most of the housing in the area was owner occupied (61.6%). Renters occupy 33% of the housing and 5.4% are vacant.

Figure 3-13: Tenure and Occupancy Status

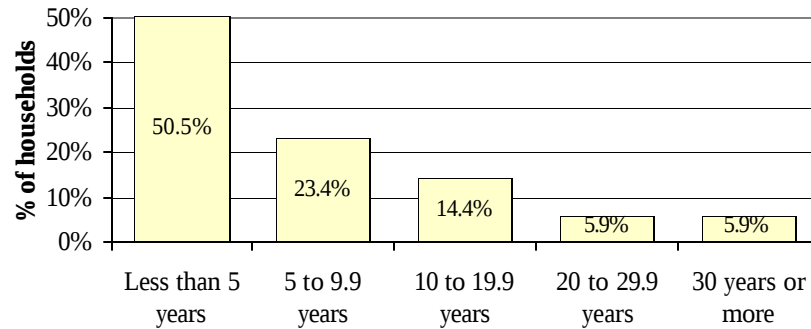


(Source: 1996 American Community Survey)

Length of Residence

As of 1996, approximately one half of the residents in the Town Center area (50.5%) have been living there for less than 5 years. Only 11.8% of the households have been living in the area for 20 years or more.

Figure 3-14: Length of Residence

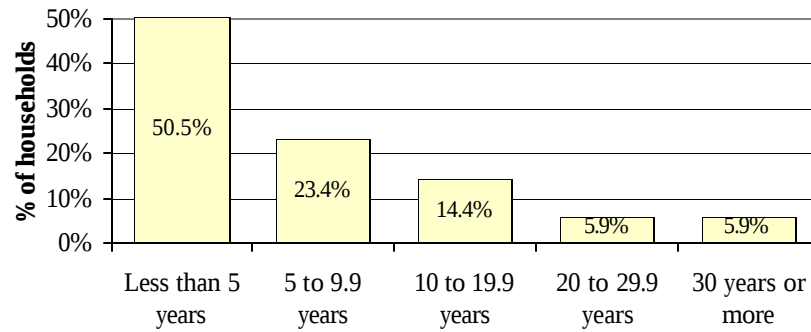


(Source: 1996 American Community Survey)

Vehicle Availability

As of 1996, the predominant share of households in the Town Center area (50.6%) has 2 vehicles available for use. And the second largest share, with 29.4% of the households, has 1 available vehicle. Nearly 20% of the households have more than 2 vehicles (13.3% have 3; 3.6%, 4; 1.4%, 5 or more). The share of the households with no vehicle available is extremely low (1.7%).

Figure 3-15: Vehicles per Household



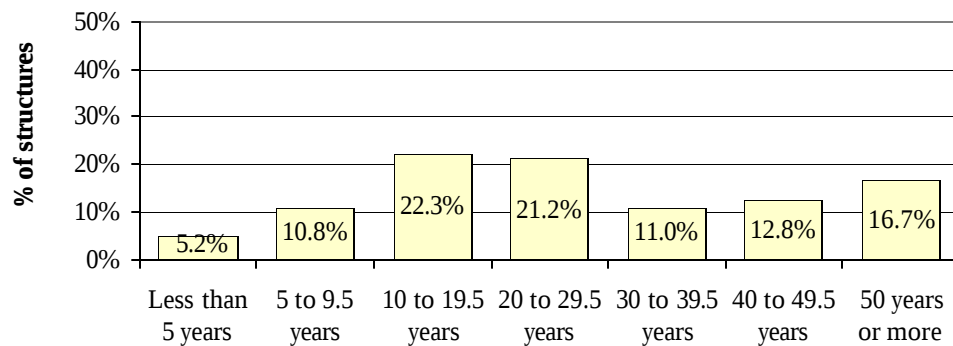
(Source: 1996 American Community Survey)

Housing Characteristics

Age of Housing.

The largest share of housing development in the Town Center area took place from 1967 through 1986. Until 1992, the remaining development was distributed fairly evenly, with shares ranging from 10.8% (from 1987 through 1991) to 16.7% (prior to 1946).

Figure 3-16: Age of Housing Structure



(Source: 1996 American Community Survey)

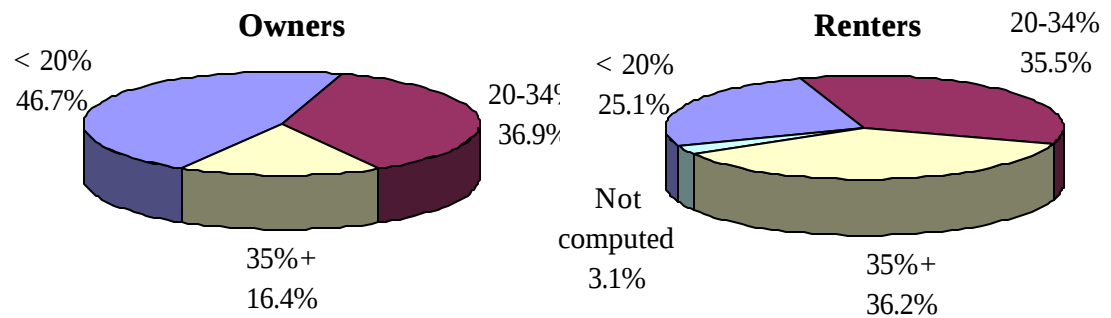
Housing Costs

In 1996, according to the American Community Survey, the median house value in the Town Center area was \$148,913. The median contract rent for residential housing was \$633 per month.

Housing Costs as a Percentage of Household Income

Based on 1996 data, the highest proportion of homeowners in the area (46.7%) spends less than 20% of their household income on housing. Nearly 37% spend 20-34 percent of their income on housing and 16.4% spend 35 percent or more. Renters were more evenly distributed; 25.1% spent less than 20 percent of their income on housing, 35.5% spent 20-34 percent and 36.2% spent 35 percent or more.

Figure 17: Owner vs. Renter Housing Costs as a Percentage of 1996 Household Income



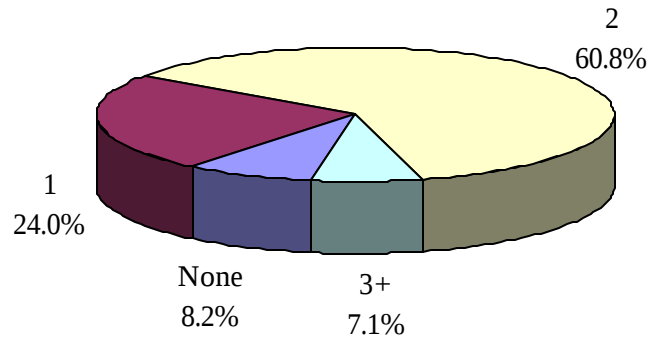
(Source: 1996 American Community Survey)

Employment Characteristics

Workers Per Family

Well over one half of families in the Town Center area (60.8%) had 2 workers in their family in 1996. The second highest share, with 24%, had one worker per family. The remaining families, those with no workers or 3 or more workers, made up a relatively small share. Only 8.2 percent of the families do not have a worker in their family and only 7.1 percent have three or more.

Figure 3-18: Workers Per Family



(Source: 1996 American Community Survey)

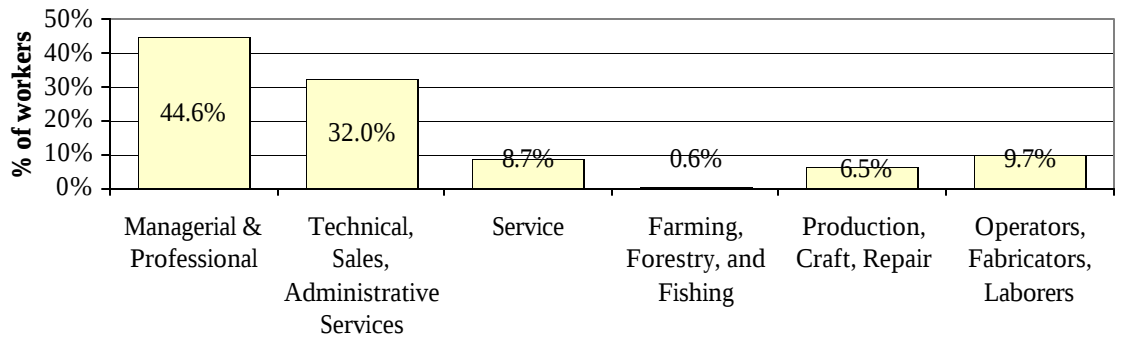
Household Income

According to American Community Survey data, the median 1996 adjusted household income for the Town Center area was \$43,970.

Occupation of Local Workforce

In 1996, most workers in the Town Center area were employed in either managerial and professional occupations (44.6%) or technical, sales and administrative occupations (32%). All other occupations were relatively underrepresented; operators, fabricators and laborers accounted for 9.7 percent of the workforce; service occupations made up 8.7 percent; and production, craft and repair occupations made up only 6.5 percent. Farming, forestry and fishing occupations were the most underrepresented, employing less than 1 percent of the workforce.

Figure 3-19: Occupations



(Source: 1996 American Community Survey)

Place of Work for Area Residents

Over half of the Town Center area residents (64.6%) work in Multnomah County, with nearly all of these employed in the City of Portland (62.1%). Only 3.6% of workers commute outside the Portland metropolitan region.

Figure 3-20: Place of Work: State & County

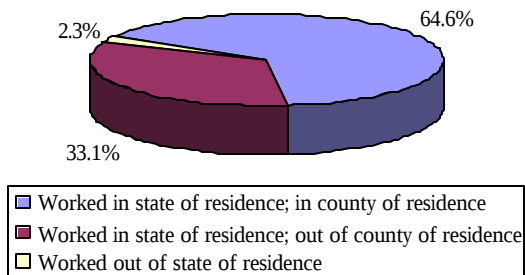
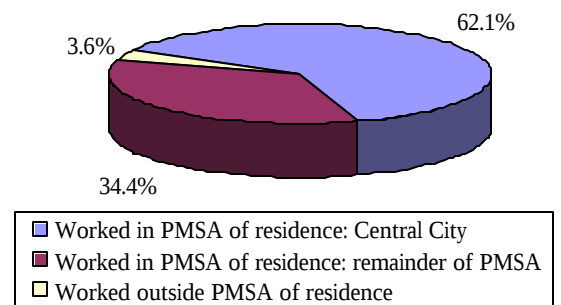


Figure 3-21: Place of work: PMSA



(Source: 1996 American Community Survey)

Descriptor Values

The baseline descriptors' values for the West Portland Town Center are list below.

Density

The density descriptors measure the intensity of development in an area. The calculation of density is based on net acreage. The net acreage in the West Portland Town Center is 203 acres.

- ◆ Single Family Density = 2 dwelling unit per net acre
- ◆ Multi family Density = 5 dwelling units per net acre
- ◆ Total residential density = 7 dwelling units per net acre
- ◆ Total employment density = 15 employees per net acre

Diversity

The diversity descriptors measure the mix of uses in an area.

	Number of Uses	% of Total Land Use Area within Center
Detached Residential	379	40%
Attached Residential	960	20%
Key Commercial Activities	38	7%
Schools	1	4%
Community Center/Library	1	1%
Parks and Open Space	0	0%

Design

The design descriptors measure street and building characteristics.

The following descriptors relate to the street design:

- ◆ Intersection density = 6.6 intersections per mile
- ◆ Percentage of street segments with sidewalks along both sides of the street = 6%
- ◆ Percentage of designated bicycle facilities built to date = 50%

Fifty-six commercial properties were evaluated on transit/pedestrian friendliness. The criteria used to evaluate each property include:

1. Building setback within 25 feet of the transit/pedestrian street.
 2. No vehicle parking between the transit/pedestrian street and building.
 3. Main entrance to the building orientated to the transit/pedestrian street.
- ◆ Percentage of properties meeting three criteria = 11%
 - ◆ Percentage of properties meeting two criteria = 18%
 - ◆ Percentage of properties meeting one criterion = 37%
 - ◆ Percentage of properties meeting none of the criteria = 34%

Transit Service

The transit service descriptors measure the quality of transit service in the area.

- ◆ Number of lines serving the area = 4

Route	Peak Hour Headway	Mid-day Headway	Service Hours
#5	10 minutes	15 minutes	16 hours
#12	10 minutes	15 minutes	19 hours
#43	30 minutes	60 minutes	12 hours
#64X	30 minutes	No Service	4 hours

Transportation Demand Management

The transportation demand management descriptor is a tally of employer TDM programs in the area.

- ◆ Number of employers subject to Eco-rule requirements = 2

Parking

The parking descriptors measure the availability and cost of area parking.

- ◆ Average cost of parking per hour = \$0.00
- ◆ Average off-street parking spaces per 1000sf of commercial use = 3.5 spaces/1000sf

Demographics

The demographic descriptors measure key socio-economic patterns in the area.

- ◆ Median income = \$43,970

◆ Household Size

Number of Persons in Household	Percentage
1 Person	30%
2 Persons	37%
3 Persons	16%
4 Persons	12%
5 Persons	3%
6 Persons	2%
7 or More Persons	0%

◆ Household Workers

Number of Workers in Household	Percentage
0 Workers	8%
1 Worker	24%
2 Workers	61%
3 or More Workers	7%

◆ Vehicle Ownership

Number of Vehicles	Percentage
No Vehicles	2%
1 Vehicle	29%
2 Vehicles	51%
3 Vehicles	13%
4 Vehicles	4%
5 or More Vehicles	1%

Travel Profile

The West Portland Town Center travel profile is based on 1994 travel behavior data from Metro's transportation analysis zones 65,68, and 69. This zone approximates the West Portland Town Center boundary.

In 1994, in estimated 39,458 person trips had origins or destinations within the area. Of the total trips, 3% were local to the area and 97% had an origin or destination outside of the zone. Table 3-2 shows the distribution of these trips by purpose. As with the other study areas, the largest percentage (40%) of trips fall into the Home-based Other category. Notable, is the relatively high percentage (28%) of Home-based Work trips in comparison to other centers.

Table 3-2: West Portland Town Center Trip Distribution by Trip Purpose

Trip Purpose	% of Total Person Trips
Home-based Work Trips	28%
Home-based Other Trips	40%
Non-home-based Work Trips	14%
Non-home-based Non-work Trips	13%
College Trips	1%
K-12 School Trips	4%

Table 3-3 provides the distribution of mode splits for each purpose. Predictably, the drive alone category captures the greatest share of trips for all modes with the exception of College and School.

Table 3-3: West Portland Town Center Mode Split by Trip Purpose

Trip Purpose	Drive Alone	Shared Auto	Transit	Walk & Bike	School Bus
Home-based Work	75%	14%	8%	3%	0%
Home-based Other	60%	33%	2%	5%	0%
Non-home-based Work	64%	35%	1%	0%	0%
Non-home-based Non-work	64%	35%	1%	0%	0%
College	42%	24%	12%	22%	0%
K-12 School	3%	2%	19%	54%	22%

Figures 3-22 and 3-23 show the primary travel patterns between the West Portland Town Center and other transportation zones in the region. Of the total trips for the area, 47% originate in West Portland Town Center and 53% come to the area from other zones. The majority trips coming to and leaving from West Portland Town Center occur in the southwest part of the region.

Figure 3-22: Geographic Distribution of Trips Originating in West Portland Town Center

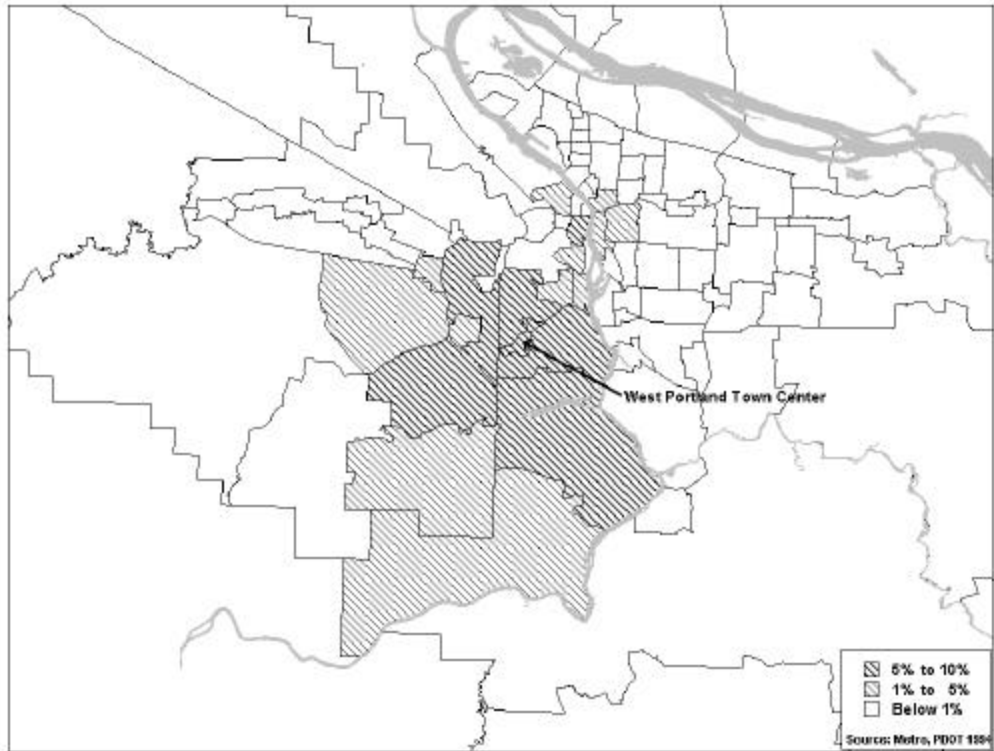
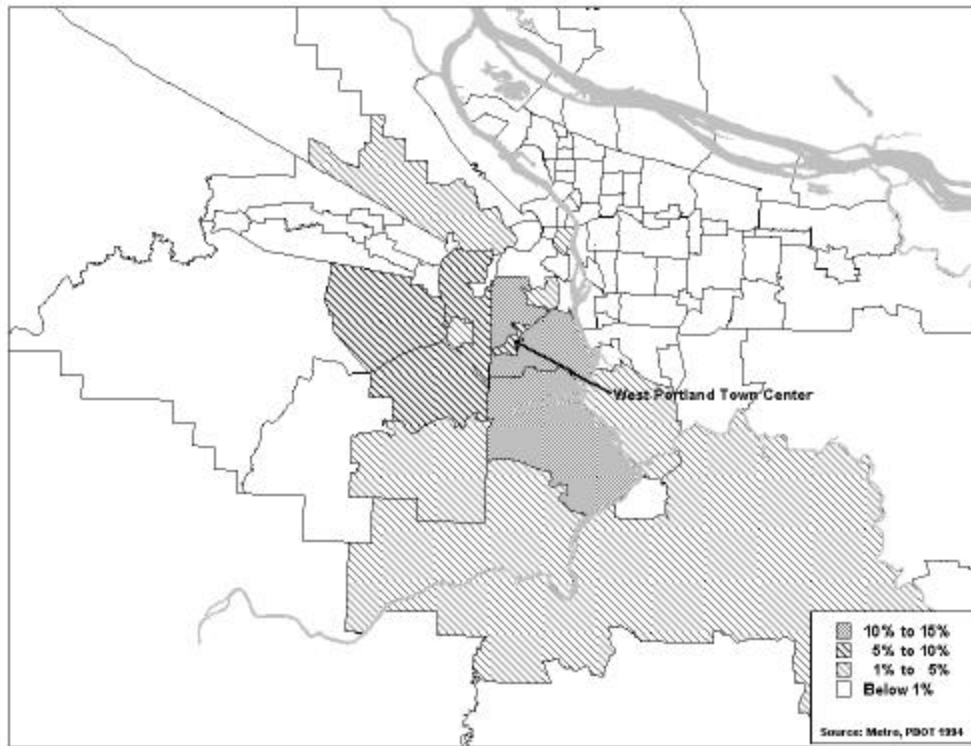


Figure 3-23: Geographic Distribution of Trips Destined for West Portland Town Center



Case Study 4 60th Station Community

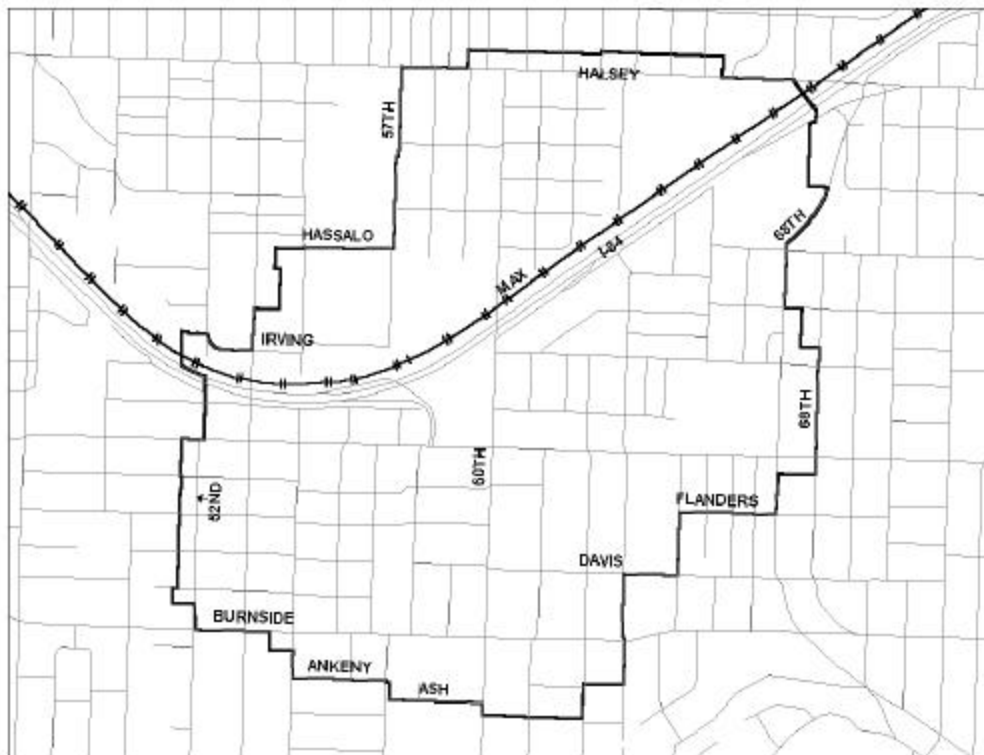
Study Area Profile

Location

The 60th Station Area encompasses 344 acres surrounding the 60th MAX station. The area extends east to 69th Avenue, west to approximately 53rd Avenue, and just past NE Halsey to the north and E Burnside to the south.

The majority of the station area lies within two neighborhoods. North of I-84 the station area is part of Rose Park City and south of I-84 is in the Center neighborhood. The section south of Burnside lies in the Mount Tabor neighborhood and the northeast corner (north of I-84) is in the South Madison neighborhood.

Figure 4-1: 60th Station Area Vicinity Map

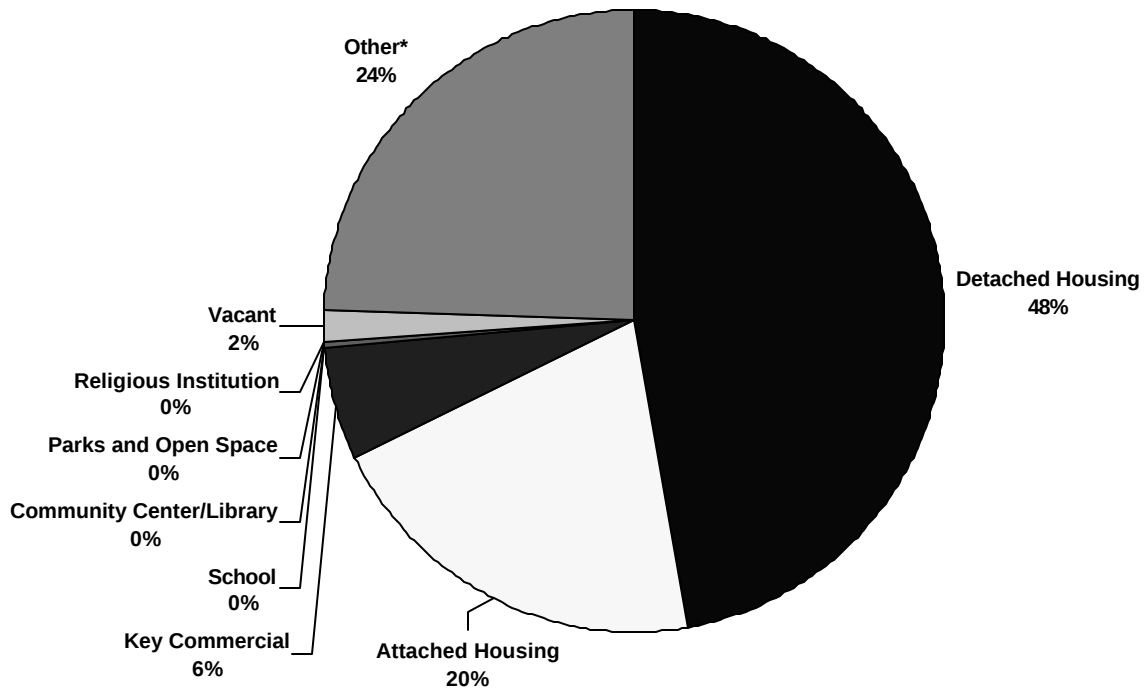


Land Use

Current Land Use Pattern

Figure 4-2 charts the land use distribution for the 60th Station Area. The station area is largely residential, a mix of attached and detached units interspersed throughout the study area. There are approximately 2217 housing units, 901 detached and 1316 attached. A new transit-oriented development is under construction on NE 60th between NE Glisan and I-84, which will add an additional 314 units of mixed housing and retail space.

Figure 4-2: 60th Station Area Land Use Distribution



* Other category includes Vehicle Services, Industrial uses, Commercial and Retail uses not identified as key commercial, and Institutional Uses excluding schools, civic uses, and religious uses.

Table 4-1 shows the type of key commercial activities currently available in the station area. The commercial activities are located along NE Halsey, SE Glisan, and Burnside. Of the approximately 54 commercial structures found in the station area, 67% were found to have a transit and pedestrian-friendly design.

Table 4-1: Distribution of Key Commercial Activities in 60th Station Area

Key Commercial Categories	Number of Establishments
Grocery	7
Drug Store	2
Restaurant	11
Personal Services	15
Retail Goods	9
Professional Services	4

The station area's estimated employment in 1996 was 2,096. Commercial, industrial, and government activities generate area employment. As previously mentioned, commercial activities are located along the arterials. A large swath of land along the north side of I-84 is used for warehouse and distribution activities. Multnomah County's Department of Juvenile and Adult Community Justice adds to the total employment. Of the total area employers, three are subject to Eco-rule requirements.

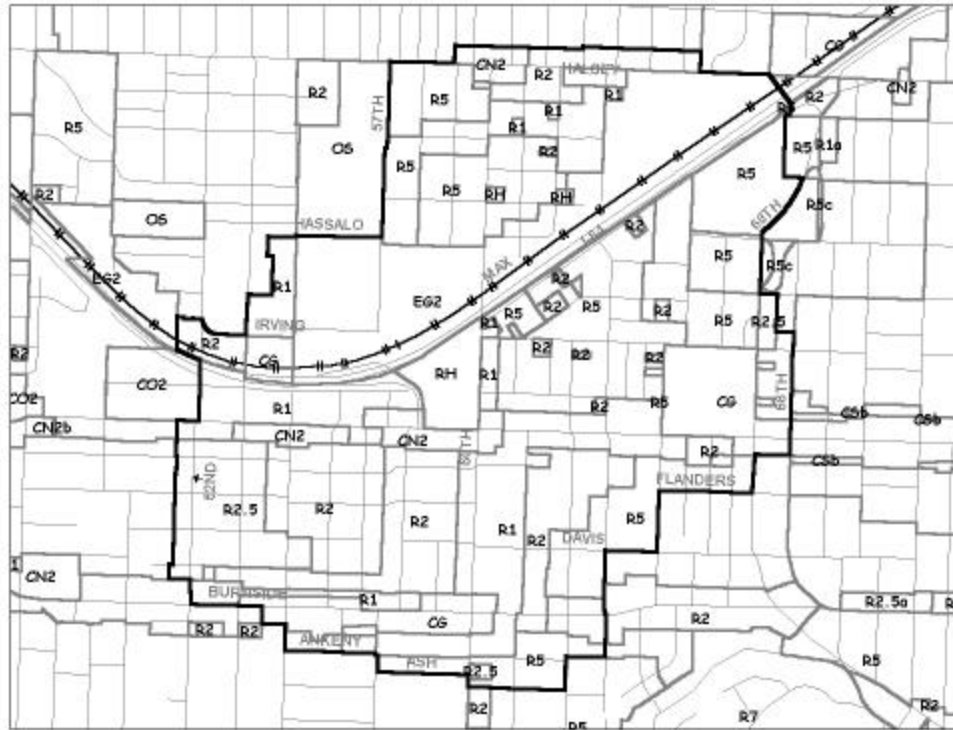
Zoning

Figure 4-3 shows the current zoning found in the 60th Station Area. The area underwent rezoning during the Transit Station Area Planning Program, completed in 1982. More recently the station area was included in the East Portland Community Plan process. However, the planning process has been terminated.

Much of the existing residential zoning allows medium to high-density dwellings. A 5-acre parcel of RH zoning, located just south of the station, will accommodate the new Center Commons mixed use development. There are two pockets of RH zoning to the north of the station. The other residential zones range from R1, allowing up to 65 units per acre (with density bonuses) to R5, allowing 8.7 units per acre.

In terms of commercial and employment zoning, NE Halsey and NE Glisan have pockets of Neighborhood Commercial (CN2), which is intended to attract small scale retail or service operations that serve local residents. E Burnside has General Commercial (CG) zoning west of NE 60th, which allows auto-oriented commercial activities. Just north of I-84 lie roughly 34 acres of land zoned General Employment (EG2), intended to support industrial or industrial-related uses.

Figure 4-3: 60th Station Area Zoning



Parks and Open Space

The 60th Station Area does not have any parkland located within the station area. However, 14 acre Normandale Park lies just outside the station area at NE Halsey and NE 57th. Further west is the 4 acre Fraser Park.

Community Buildings

There are no community facilities, such as libraries, schools, or community centers located in the 60th Station Area. The Mount Tabor Middle School is located just south of the station area boundary on SE 60th. One county facility, the Multnomah County Department of Juvenile and Adult Community Justice, is located on the eastern edge of the station area.

Circulation

The physical layout of the 60th Station Area is characterized by a more traditional street grid pattern. Good street connectivity and relatively close spacing provide accessibility to land use activities. The caveat to this observation: the presence of I-84 divides the station area into to distinct halves. While accessibility is strong in the neighborhoods north and south of the freeway, the connections across are limited to only SE 53rd and SE 60th.

Traffic

Figure 4-4 shows the traffic street classifications in the 60th Station Area and Figure 4-5, the 1996 traffic volumes. NE Glisan is designated a Main Street for its entire length in the Town Center. I-84 serves as a Regional Trafficway. Westbound on ramps and eastbound on ramps to I-84 are located on NE Glisan, just west of NE 60th. The eastbound on ramp to I-84 is located on NE 60th, south of the freeway. NE Halsey and E Burnside are classified as Major City Traffic Streets. NE 60th and NE Glisan are District Collectors.

Figure 4-4: 60th Station Area Traffic Street Classifications

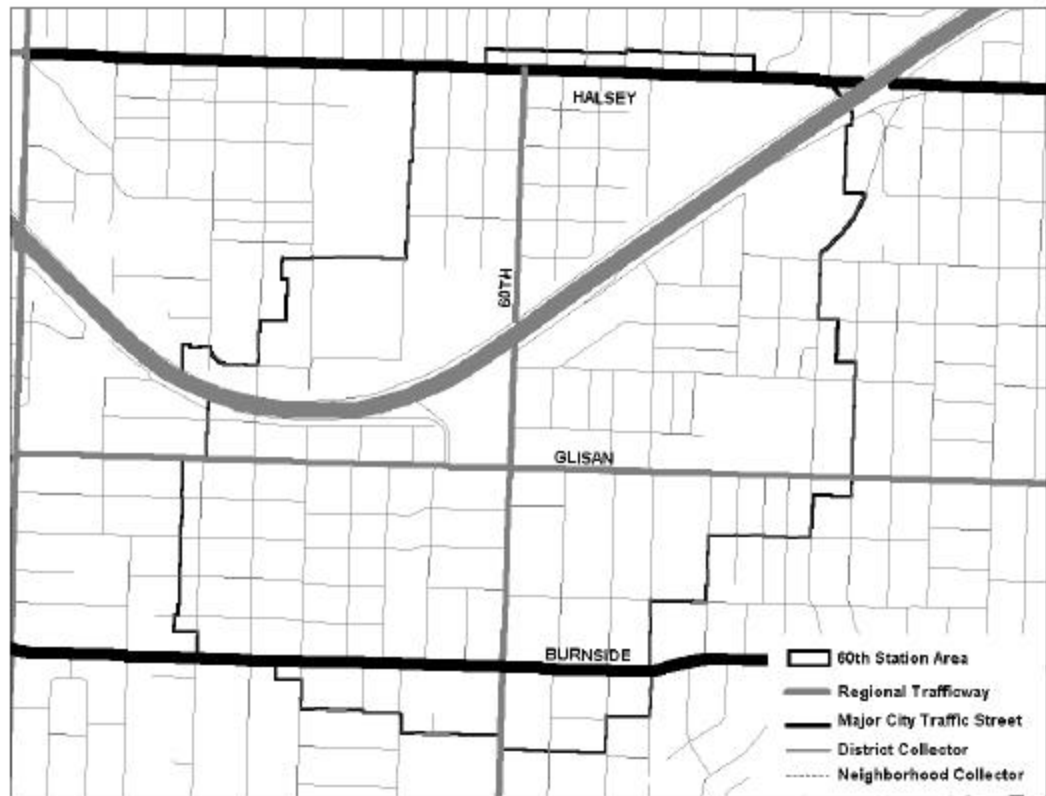
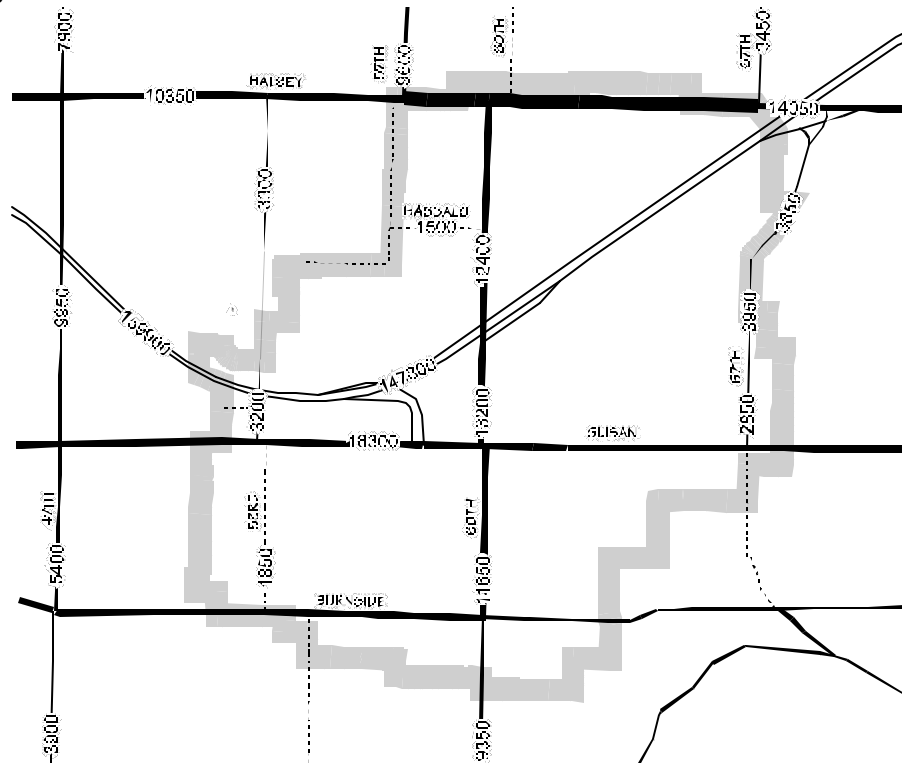


Figure 4-5: 60th Station Area Traffic Flow



Transit Service

The 60th Station Area is focused on the Eastside MAX Light Rail Station at 60th and I-84. Eastside Max provides regional service from downtown Gresham to downtown Portland and continued service along the Westside MAX alignment to Beaverton and Hillsboro. Service to downtown Portland at the 60th station begins at approximately 4:25am and continues until 2:00am. MAX trains run at a high frequency throughout the day. Trains average seven and one half-minute headways in the peak hour and ten-minute headways during non-peak hours.

In addition to frequent light rail service, the 60th station area is served by four Tri-Met bus routes: Routes #19, 20, 71, and 77. Route #19 runs along the southern border of the 82nd study area on NE Glisan. It connects the Gateway Transit Center with downtown Portland along NE Glisan and E. Burnside. Since a direct connection is not made at the 60th light rail station, Route #19 does not serve as a feeder route to the East Side MAX but rather acts as complimentary transit service to the area. The route provides service at 15-minute headways between 5:00am and midnight.

Route #20 runs along Burnside through both east and west Portland. It connects the Gateway Transit Center with downtown Portland and continues West to Cedar Hills and the city of Beaverton. Service on Route #20 begins at 5:00am and continues at 15-minute headways till 1:00am.

Route #71 provides a north/south connection to 122nd station area. It originates in the Lents neighborhood at the intersection of 94th Avenue and SE Foster Road. The route then travels east along Foster Road and North along 122nd Avenue to its connection at the 122nd Light Rail Station. Route #71 provides continuing connecting service through NE Portland, where it connects with Eastside Max at 60th and proceeds to its terminus at Clackamas Town Center. This route provides service from approximately 5:00am to 10:00pm at 15-minute headways throughout the day.

Route #77 originates at the Gateway Transit Center and travels through the 82nd Station Area along NE Halsey. This route connects the station area with Hollywood Town Center, the Rose Quarter and NW Portland. The route operates at 15-minute headways between 5:00am and 9:45pm.

Pedestrians

Figure 4-7 shows the streets classified as City Walkways in the area. The majority of street segments in the area are fully improved with curbs and sidewalks (84%). The streets classified as City Walkways are generally improved with sidewalks. The unimproved local street segments are found primarily north of I-84.

Pedestrians benefit from the good street connectivity and relatively small block pattern found in the area. Figure 4-8 shows the location of traffic signals that provide pedestrians with regulated crossings of busy streets.

Bicycles

Figure 4-9 shows the bicycle network for this station area. Currently, no streets in the station area have bike facility improvements.

Figure 4-6: 60th Station Area Transit Service

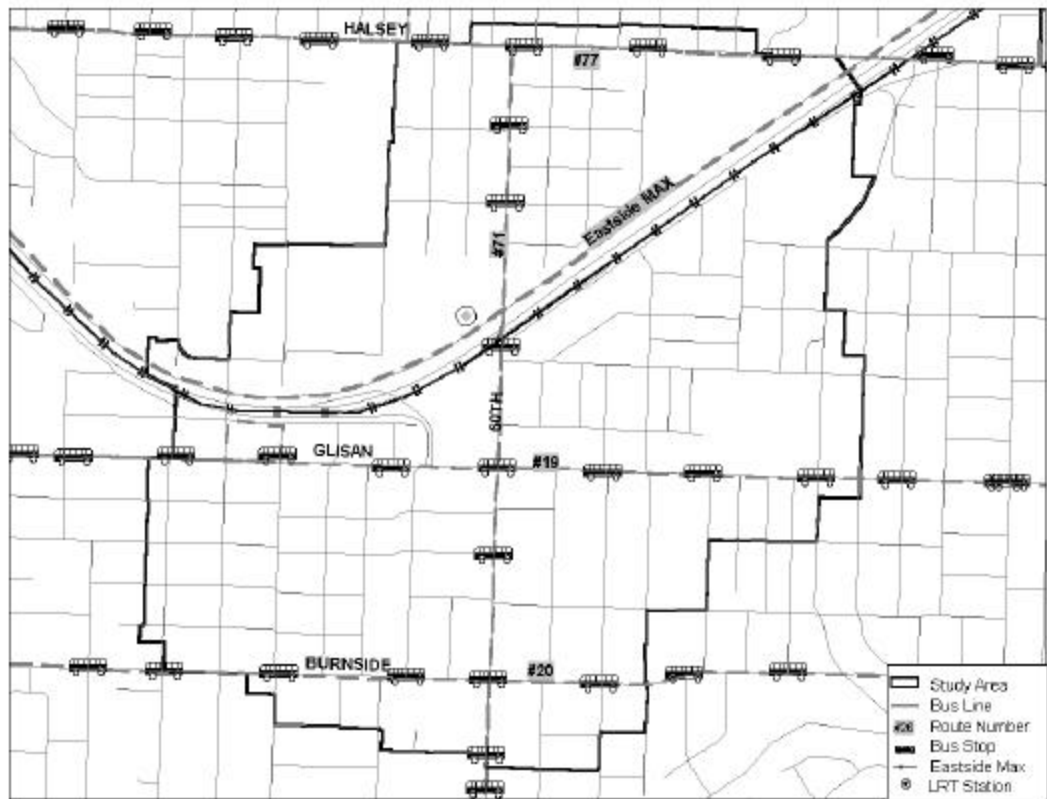


Figure 4-7: 60th Station Area Pedestrian Street Classifications

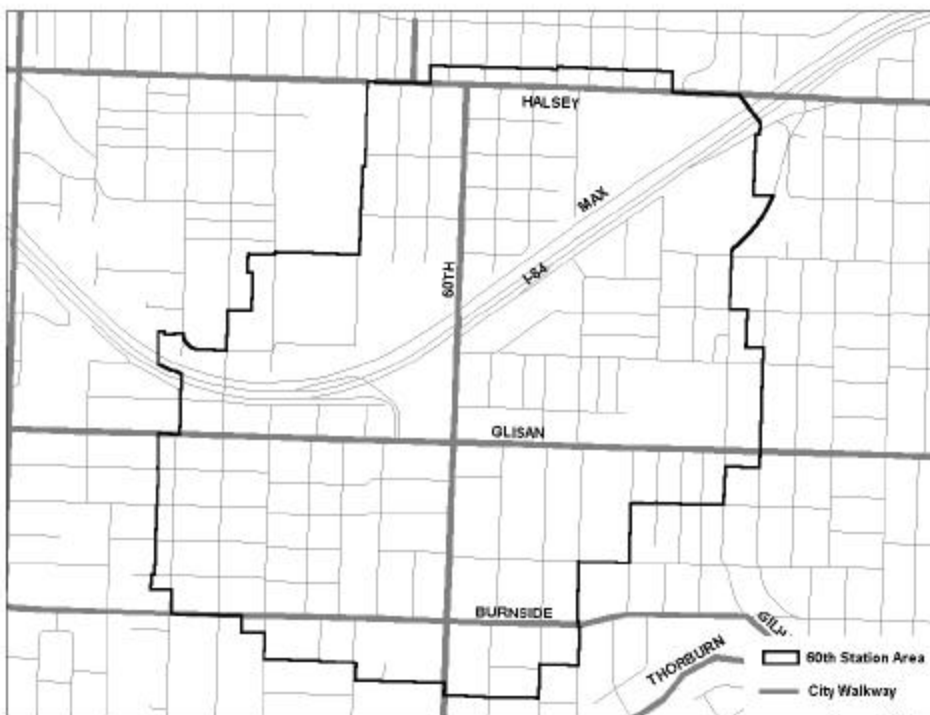


Figure 4-8: 60th Station Area Traffic Signals

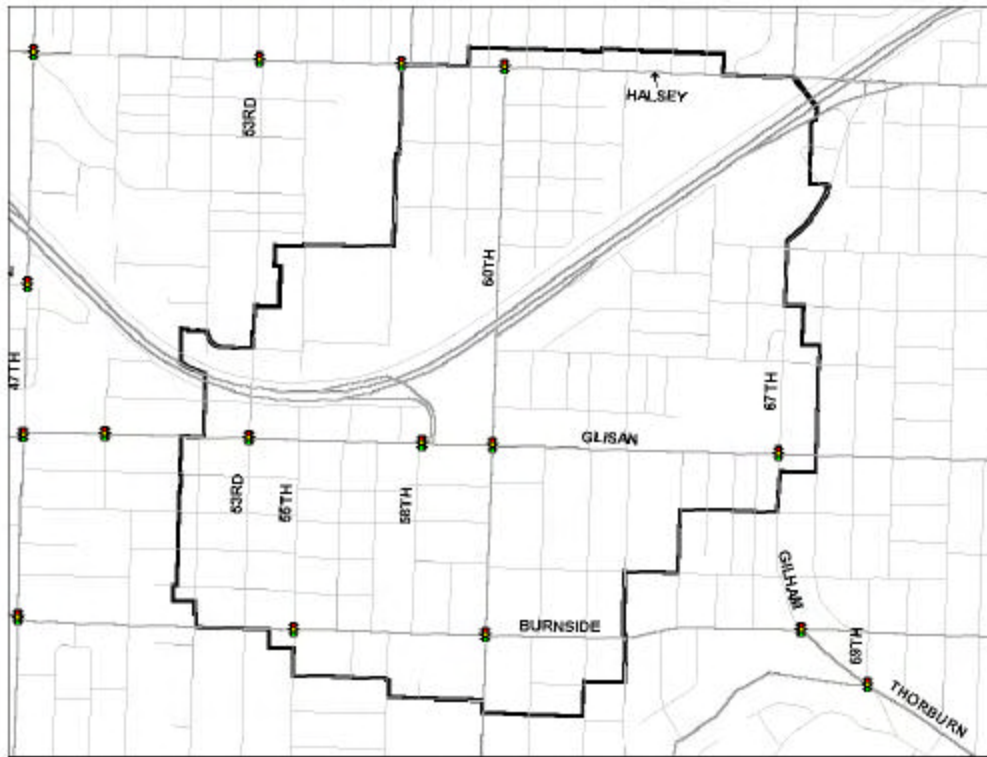
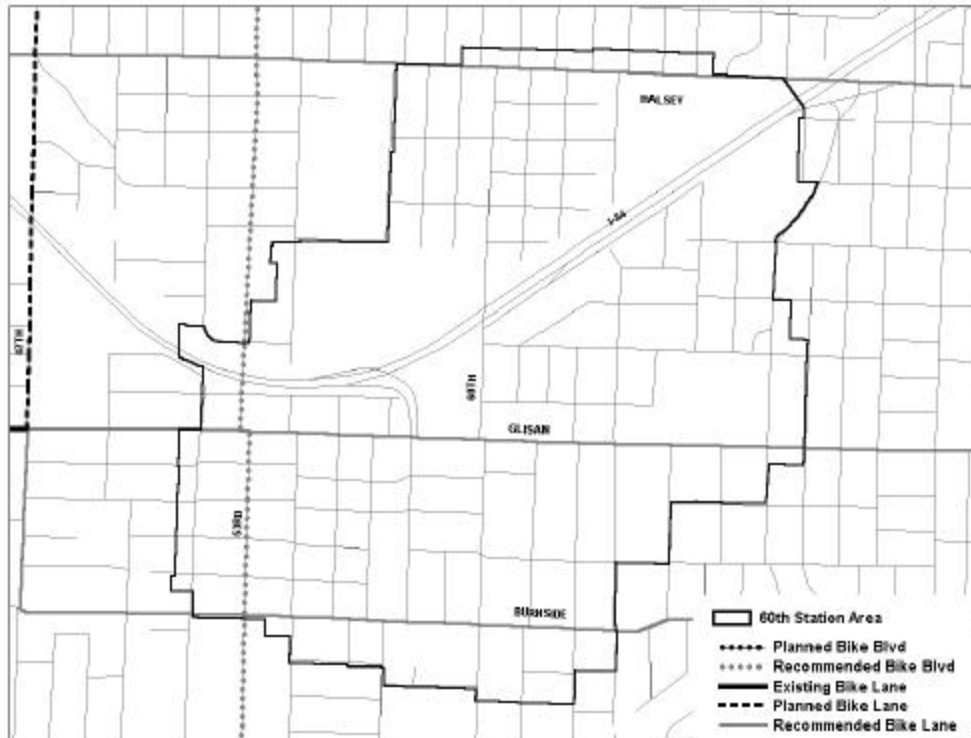


Figure 4-9: 60th Station Area Bicycle Network

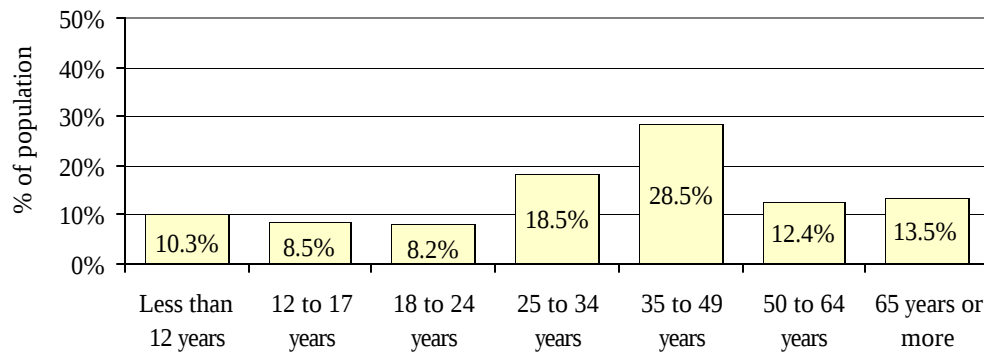


POPULATION AND HOUSEHOLD CHARACTERISTICS⁵

Age Distribution.

As of 1996, the largest age group in the 60th Avenue station area was residents from 35 to 49 years of age (28.5% of population). The age group with the second highest proportion of residents was 25 to 34 years (18.5%). The remaining age groups were distributed fairly evenly, ranging from a low of 8.2% (18 to 24 years) to a high of 13.5% (65 years or more).

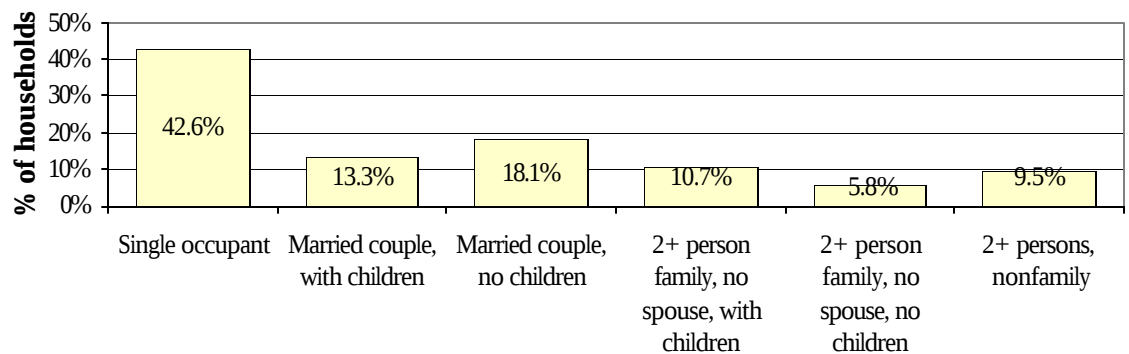
Figure 4-10: Age Distribution



Household Size and Type

The overwhelming majority of households in the 60th Avenue station area were single occupants, which represented 42.6% of the total households. Married couple households with children was the next most common household type, although it made up only 18.1% of the households. The household type with the smallest share (5.8%) were family households of 2 or more persons, with no spouse present and no children. The remaining households made up 13.3% (married couples with children), 10.7% (family households with two or more persons, no spouse present, with children), and 9.5% (non-family households of 2 or more) of the total households.

Figure 4-11: Household Size and Type

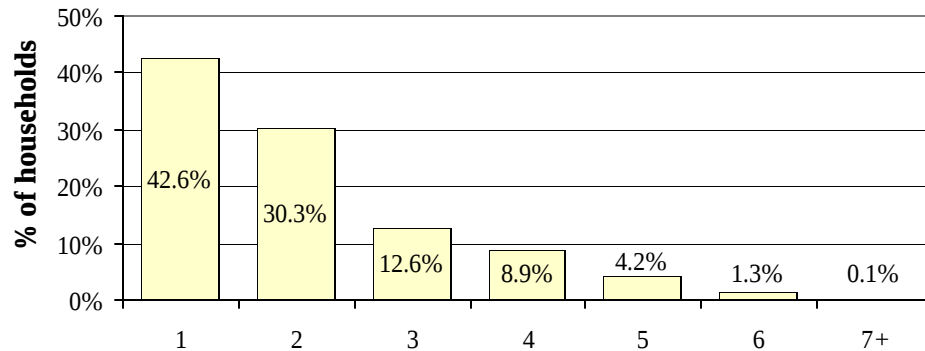


⁵ Since data is reported on the basis of block groups, the following medians and percentages are based on block group medians and totals.

Persons Per Household

As of 1996, the majority of households in the area were made up of only 1 or 2 persons (42.6% and 30.3% respectively, with a combined share of 72.9%). The remaining household sizes make up a much smaller share of the households; shares declined from 12.6% to 0.1% as the number of persons per household increased from 3 to 7 or more persons per household.

Figure 4-12: Persons Per Household

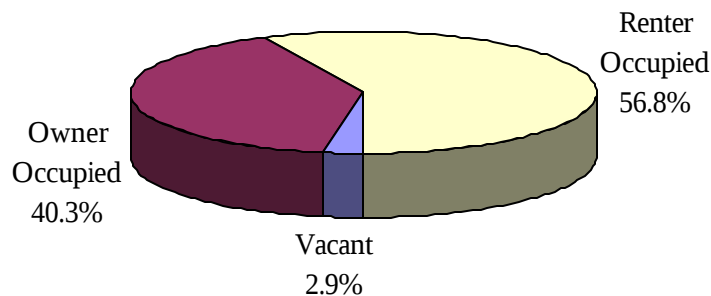


(Source: 1996 American Community Survey)

Tenure and Occupancy Status

As of 1996, most of the housing in the 60th Avenue station area was occupied by renters (56.8%). Owner occupied housing made up 40.3 percent of the total housing and almost 3 percent of the housing were vacant.

Figure 4-13: Tenure and Occupancy Status



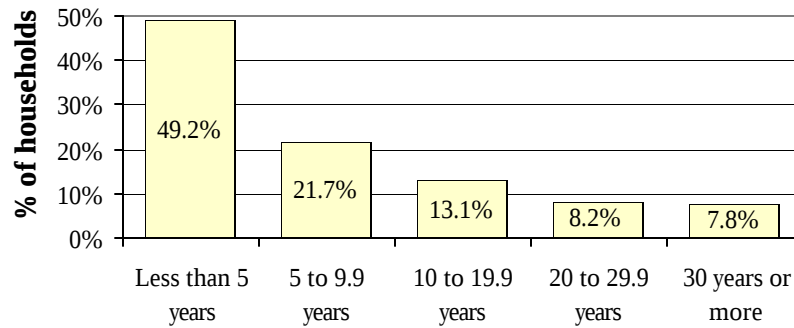
(Source: 1996 American Community Survey)

(Source: 1996 American Community Survey)

Length of Residence

Nearly one half of the residents near the 60th Avenue station (49.2%) moved to the area within the 5 years prior to 1996, likely related to the high percentage of renters in the area. The number of households with a 5 to 9.9 year residency as of 1996 was also relatively high (21.7%). Only 16 percent had lived in the area for 20 years or more.

Figure 4-14: Length of Residence

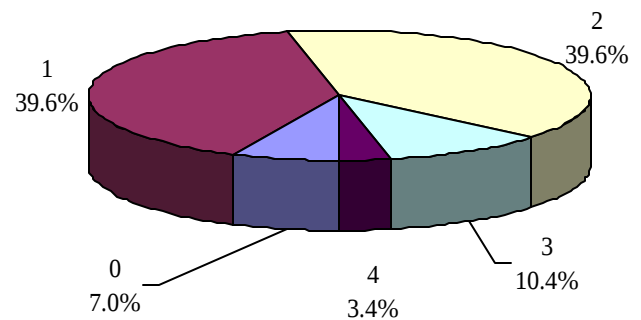


(Source: 1996 American Community Survey)

Vehicle Availability

As of 1996, nearly 80 percent of households near the 60th Avenue station had 1 or 2 vehicles available for use; separately, each group made up 39.6% of the households. Of the remaining households, 10.4% had 3 vehicles, 7.0% had no vehicle available, and only 3.4% had four vehicles.

Figure 4-15: Vehicles Per Household

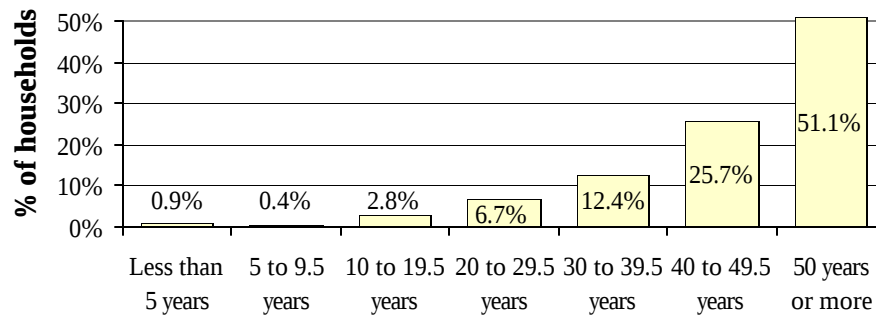


Housing Characteristics

Age of Housing

A majority (51.1%) of the housing structures near the 60th Avenue station were constructed prior to 1946, during the period of traditional-style development. The next largest share of housing development (25.7%) took place from 1947 through 1956. Only 4.1 percent of the housing structures in the area were built after 1976.

Figure 4-16: Age of Housing



(Source: 1996 American Community Survey)

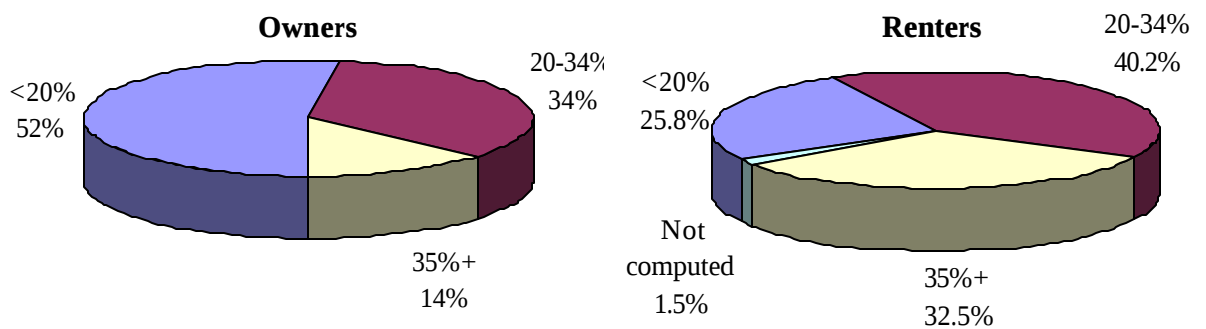
Housing Costs

In 1996, according to the American Community Survey, the median house value near the 60th Avenue station was \$112,289. The median contract rent for residential housing was \$452 per month.

Housing costs as a percentage of household income

In 1996, the largest share of homeowners in the area (55.1%) spent less than 20 percent of their household income on housing. Nearly 34% spent 20-34 percent of their income on housing and only 10.8% spent 35 percent of their income or more. Only 28.2% of renters, on the other hand, spent less than 20 percent of their income on housing, while 37.2% spent 20-34 percent and 30.3% spent 35 percent or more.

Figure 4-17: Owner vs. Renter Housing Costs as a Percentage of 1996 Household Income

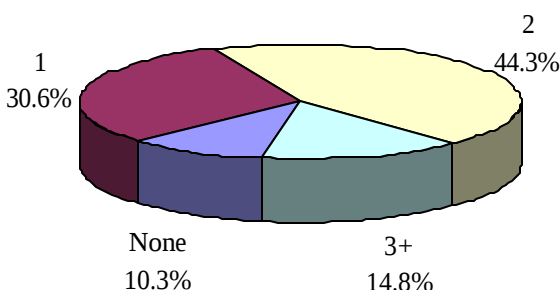


Employment Characteristics

Workers Per Family

As of 1996, the largest share of families in the area (44.3%) had 2 workers per family; the second highest share (30.6%) had only one worker. Just over 10 percent of the families had no worker in their family and nearly 15 percent had more than two workers.

Figure 4-18: Workers Per Family



(Source: 1996 American Community Survey)

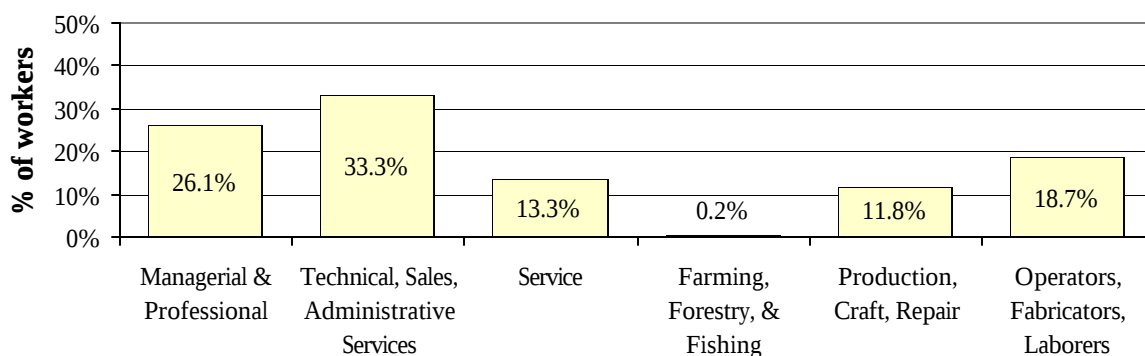
Household Income

According to American Community Survey data, the median 1996 adjusted household income near the 60th Avenue station area was \$30,094.

Occupation of Local Workforce

In 1996, the occupations with the highest share of workers from the Station area were in technical, sales and administrative occupations (33.3%) and managerial and professional occupations (26.1%). An additional 18.7% of the workforce were employed as operators, fabricators or laborers; 13.3% in service occupations; and 11.8% in production, craft or repair. Very few workers in the area (0.2%) were employed in farming, forestry and fishing occupations.

Figure 4-19: Occupations

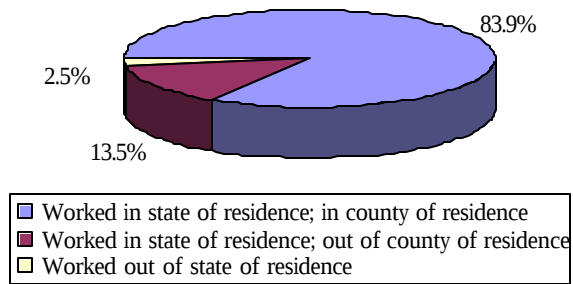


(Source: 1996 American Community Service)

Place of Work for Area Residents

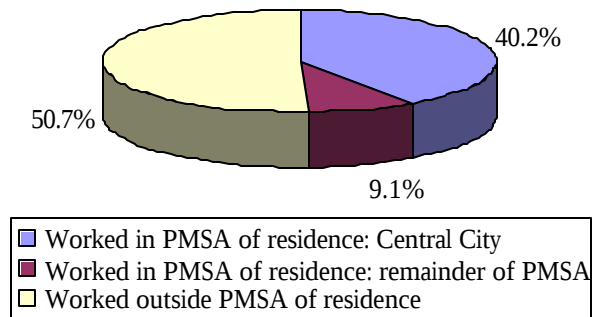
Most of the local residents (73.6%) work in Multnomah County; of these, nearly all were employed in the City of Portland (71.1%). Only 3.5% commuted outside the Portland metropolitan region.

Figure 4-20: Place of work: State & County



(Source: 1996 American Community Survey)

Figure 4-21: Place of work: PMSA



(Source: 1996 American Community Survey)

Descriptor Values

The baseline descriptors' values for the 60th Station Area are list below.

Density

The density descriptors measure the intensity of development in an area. The calculation of density is based on net acreage. The net acreage in 60th Station Area is 230 acres.

- ◆ Single Family Density = 4 dwelling unit per net acre
- ◆ Multi family Density = 6 dwelling units per net acre
- ◆ Total residential density = 10 dwelling units per net acre
- ◆ Total employment density = 9 employees per net acre

Diversity

The diversity descriptors measure the mix of uses in an area.

	Number of Uses	% of Total Land Use Area within Center
Detached Residential	901	48%
Attached Residential	1316	20%
Key Commercial Activities	48	6%
Schools	0	0%
Community Center/Library	0	0%
Parks and Open Space	0	0%

Design

The design descriptors measure street and building characteristics.

The following descriptors relate to the street design:

- ◆ Intersection density = 10.6 intersections per mile
- ◆ Percentage of street segments with sidewalks along both sides of the street = 84%
- ◆ Percentage of designated bicycle facilities built to date = 0%

Fifty-four commercial properties were evaluated on transit/pedestrian friendliness. The criteria used to evaluate each property include:

1. Building setback within 25 feet of the transit/pedestrian street.
2. No vehicle parking between the transit/pedestrian street and building.
3. Main entrance to the building orientated to the transit/pedestrian street.

- ◆ Percentage of properties meeting three criteria = 54%
- ◆ Percentage of properties meeting two criteria = 13%
- ◆ Percentage of properties meeting one criterion = 28%
- ◆ Percentage of properties meeting none of the criteria = 5%

Transit Service

The transit service descriptors measure the quality of transit service in the area.

- ◆ Number of lines serving the area = 5

Route	Peak Hour Headway	Mid-day Headway	Service Hours
MAX	7.5 minutes	10 minutes	21 hours
#19	15 minutes	15 minutes	15 hours
#20	15 minutes	15 minutes	21 hours
#71	15 minutes	15 minutes	20.5 hours
#77	15 minutes	15 minutes	17 hours

Transportation Demand Management

The transportation demand management descriptor is a tally of employer TDM programs in the area.

- ◆ Number of employers subject to Eco-rule requirements = 3

Parking

The parking descriptors measure the availability and cost of area parking.

- ◆ Average cost of parking per hour = \$0.00
- ◆ Average off-street parking spaces per 1000sf of commercial use = 2.6 spaces/1000sf

Demographics

The demographic descriptors measure key socio-economic patterns in the area.

- ◆ Median income = \$30,094

- ◆ Household Size

Number of Persons in Household	Percentage
1 Person	43%
2 Persons	30%
3 Persons	13%
4 Persons	9%
5 Persons	4%
6 Persons	1%
7 or More Persons	0%

- ◆ Household Workers

Number of Workers in Household	Percentage
0 Workers	10%
1 Worker	31%
2 Workers	44%
3 or More Workers	15%

◆ Vehicle Ownership

Number of Vehicles	Percentage
No Vehicles	7%
1 Vehicle	40%
2 Vehicles	40%
3 Vehicles	10%
4 Vehicles	3%
5 or More Vehicles	0%

Travel Profile

The 60th Station Area travel profile is based on 1994 travel behavior data from Metro's transportation analysis zones 719 and 720. This zone approximates the 60th Station Area boundary.

In 1994, in estimated 37,846 person trips had origins or destinations within the area. Of the total trips, 2% were local to the area and 98% had an origin or destination outside of the zone. Table 4-2 shows the distribution of these trips by purpose. As with the other study areas, the largest percentage (42%) of trips fall into the Home-based Other category.

Table 4-2: 60th Station Area Trip Distribution by Trip Purpose

Trip Purpose	% of Total Person Trips
Home-based Work Trips	21%
Home-based Other Trips	42%
Non-home-based Work Trips	13%
Non-home-based Non-work Trips	19%
College Trips	1%
K-12 School Trips	4%

Table 4-3 provides the distribution of mode splits for each purpose. Predictably, the drive alone category captures the greatest share of trips for all modes with the exception of College and School.

Table 4-3: 60th Station Area Mode Split by Trip Purpose

Trip Purpose	Drive Alone	Shared Auto	Transit	Walk & Bike	School Bus
Home-based Work	67%	15%	11%	3%	0%
Home-based Other	56%	31%	5%	8%	0%
Non-home-based Work	62%	35%	2%	1%	0%
Non-home-based Non-work	63%	35%	1%	1%	0%
College	28%	16%	48%	8%	0%
K-12 School	3%	2%	19%	54%	22%

Figures 4-22 and 4-23 show the primary travel patterns between the 60th Station Area and other transportation zones in the region. Of the total trips for the area, 48% originate in the station area and 52% come to the area from other zones. Of trips originating in the 60th Station Area, 52% are destined for Central City districts, 36% going to Downtown. Of trips coming to the station area, the largest percentage (14%) come from the travel zone just south of the station area zone.

Figure 4-22: Geographic Distribution of Trips Originating in the 60th Station Area

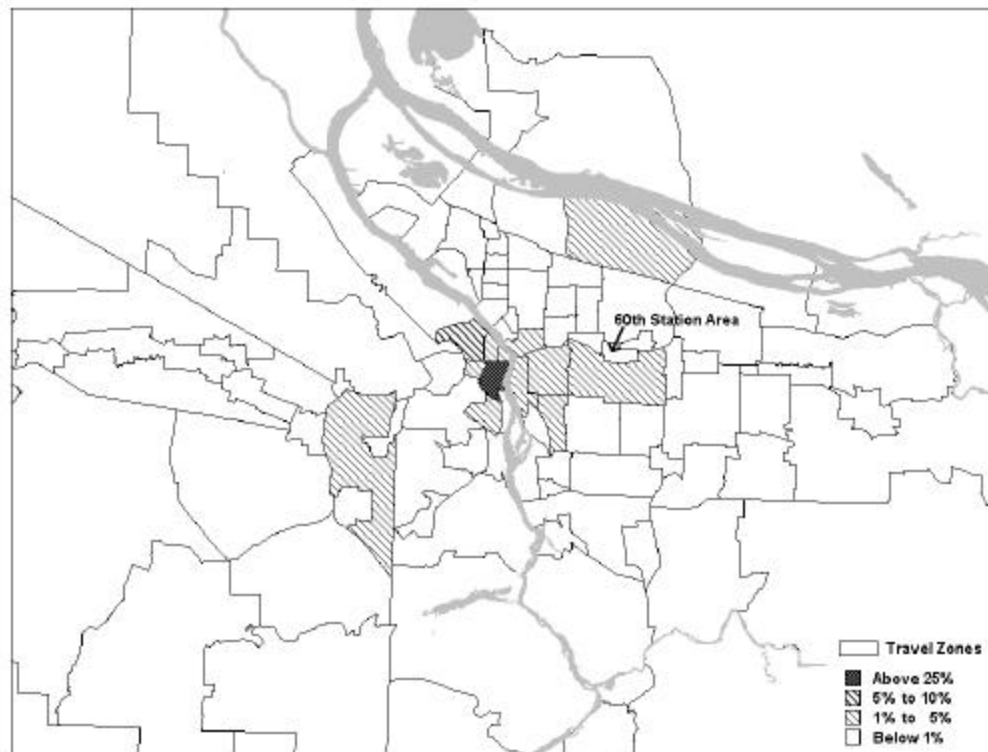
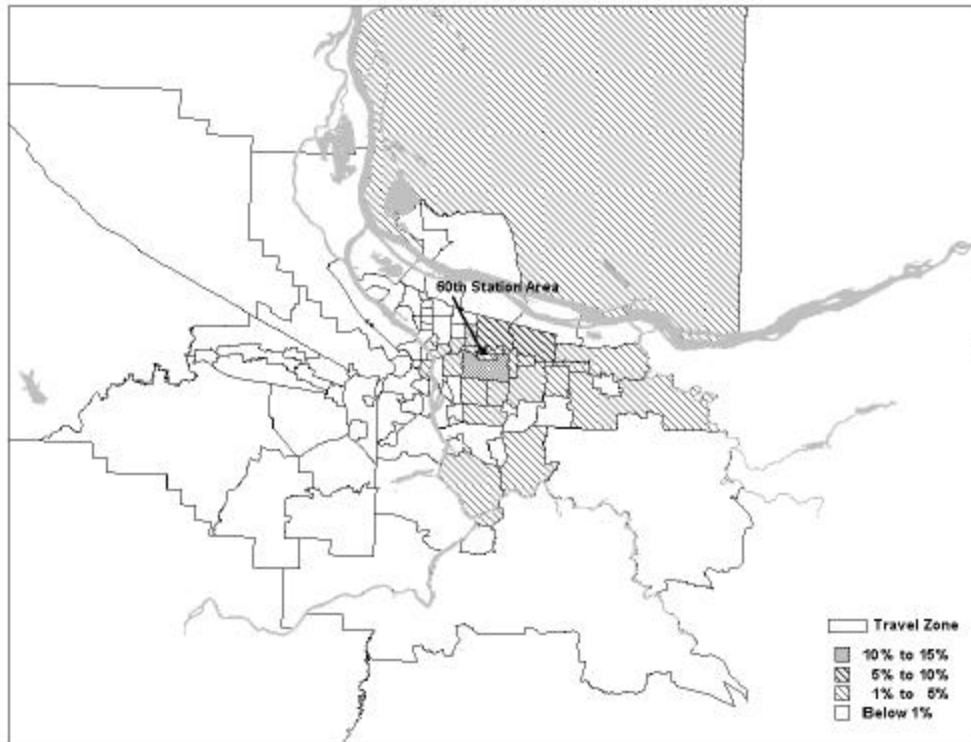


Figure 4-23: Geographic Distribution of Trips Destined for the 60th Station Area



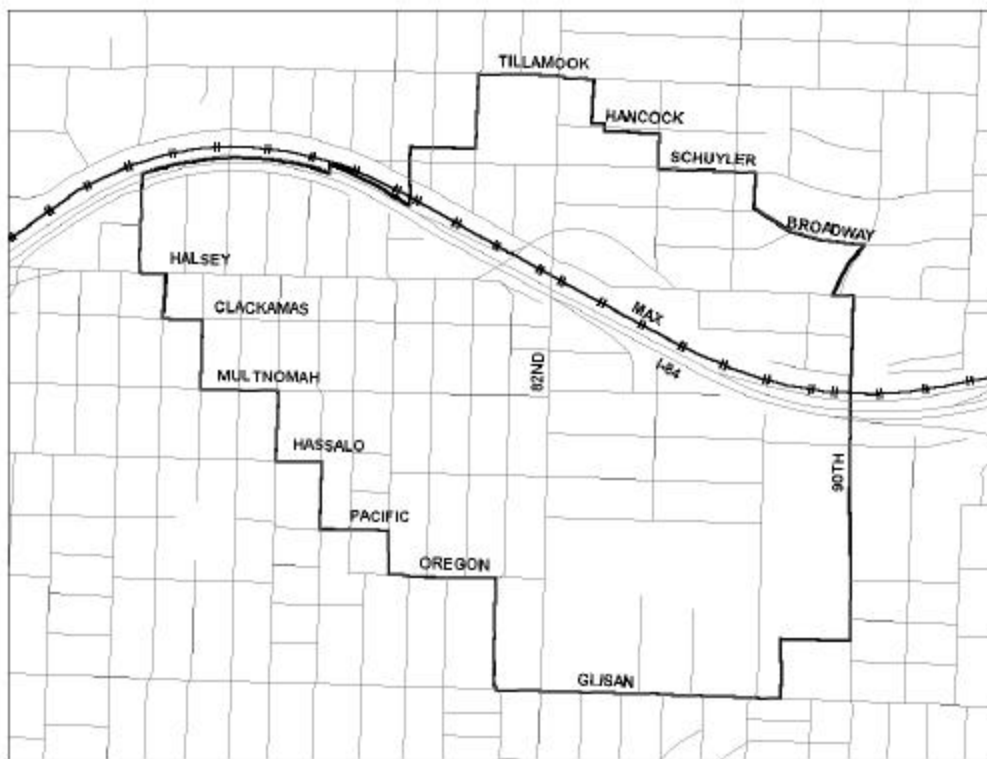
Case Study 5 82nd Station Community

Study Area Profile

Location

The heart of the 82nd Avenue station area is the Northeast 82nd Avenue MAX station, on the north side of Interstate 84. The station area is bounded by NE Glisan to the south, NE Tillamook to the north, NE 72nd to the west, and 88th to the east. The station area split into two neighborhoods. South of I-84, the station area is part of the Montavilla neighborhood. North of I-84, the station area is in the South Madison neighborhood.

Figure 5-1: 82nd Station Area Vicinity Map

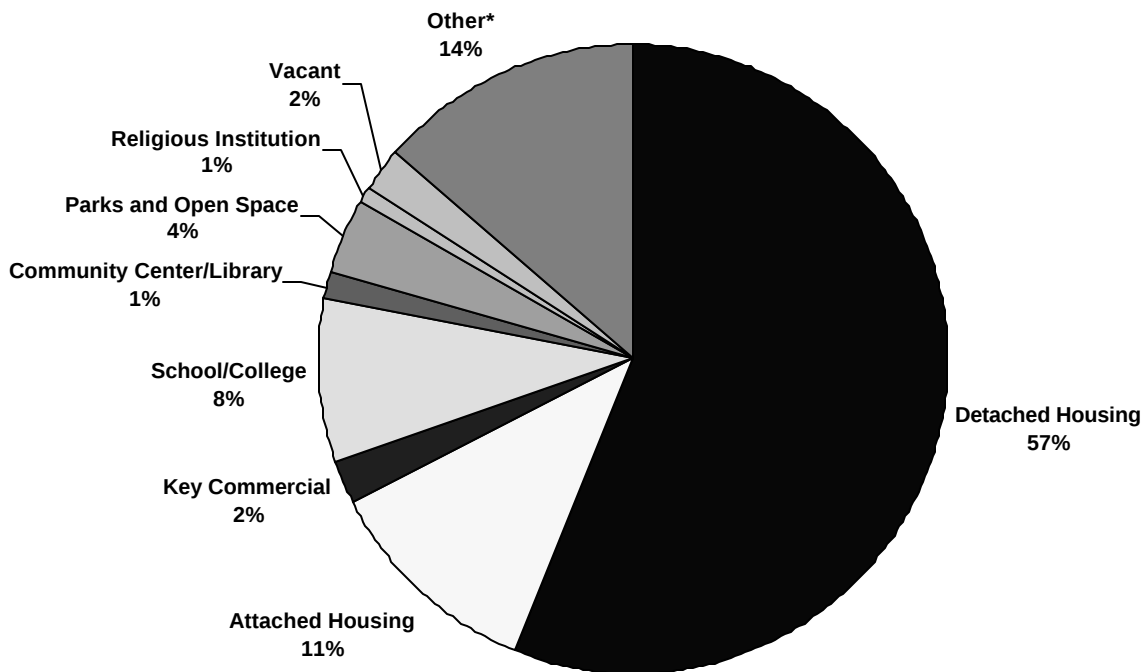


Land Use

Current Land Use Pattern

Figure 5-2 charts the land use distribution for the 82nd Station Area. The 82nd Avenue station area is occupied predominantly by residential housing. There are approximately 1183 housing units in the area. Of these, 68% are single family dwellings.

Figure 5-2: 82nd Station Area Land Use Distribution



* Other category includes Vehicle Services, Industrial uses, Commercial and Retail uses not identified as key commercial, and Institutional Uses excluding schools, civic uses, and religious uses.

Commercial activities stretch along NE 82nd and for a few blocks on NE Halsey, west of NE 82nd. Table 5-1 shows the availability key commercial activities in the area. The station area offers a limited choice of commercial activities. An analysis of commercial building design shows that about 50% of the buildings are transit- and pedestrian-friendly and the other half were more auto-oriented in design.

Table 5-1: Distribution of Key Commercial Activities in 82nd Station Area

Key Commercial Categories	Number of Establishments
Grocery	3
Drug Store	0
Restaurant	5
Personal Services	3
Retail Goods	3
Professional Services	4

The 1996 employment data puts station area employment at roughly 1,205. There are three employers in the station area subject to Eco-rule trip reduction requirements.

Zoning

Figure 5-3 shows the current zoning found in the 82nd Station Area. As with the 60th Station Area, the area was rezoned during the 1982 Transit Station Area Planning Project. The commercial zoning is concentrated along NE 82nd. South of I-84, 82nd and a few blocks of NE Halsey are zoned Storefront Commercial (CS), which is intended to preserve the character of older storefront commercial districts. North of the freeway, NE 82nd is zoned General Commercial (CG), primarily an auto-supportive designation.

The residential zoning is primarily R5, which allows 8.7 units per acre. There are pockets of medium and high-density housing interspersed. Additionally, a large section of Institutional Residential (IR) zone land is located on NE Glisan, east of NE 82nd. The Multnomah Bible College is located here.

Parks and Open Space

The station area has one public park, 8 acre Montavilla Park, located at NE 82nd and NE Glisan. Northeast of the station area lies 4 acre Hancock Park and northwest is the Rose City Golf Course.

Community Facilities

The 82nd Station Area is home to the Montavilla Community Center at NE 82nd and NE Glisan. The Portland Public School's Vocational Village is located on NE 82nd. Additionally, the station area is home to the Multnomah Bible College, the campus located on NE Glisan. Just north of the station area boundary is Madison High School.

Figure 5-3: 82nd Station Area Zoning

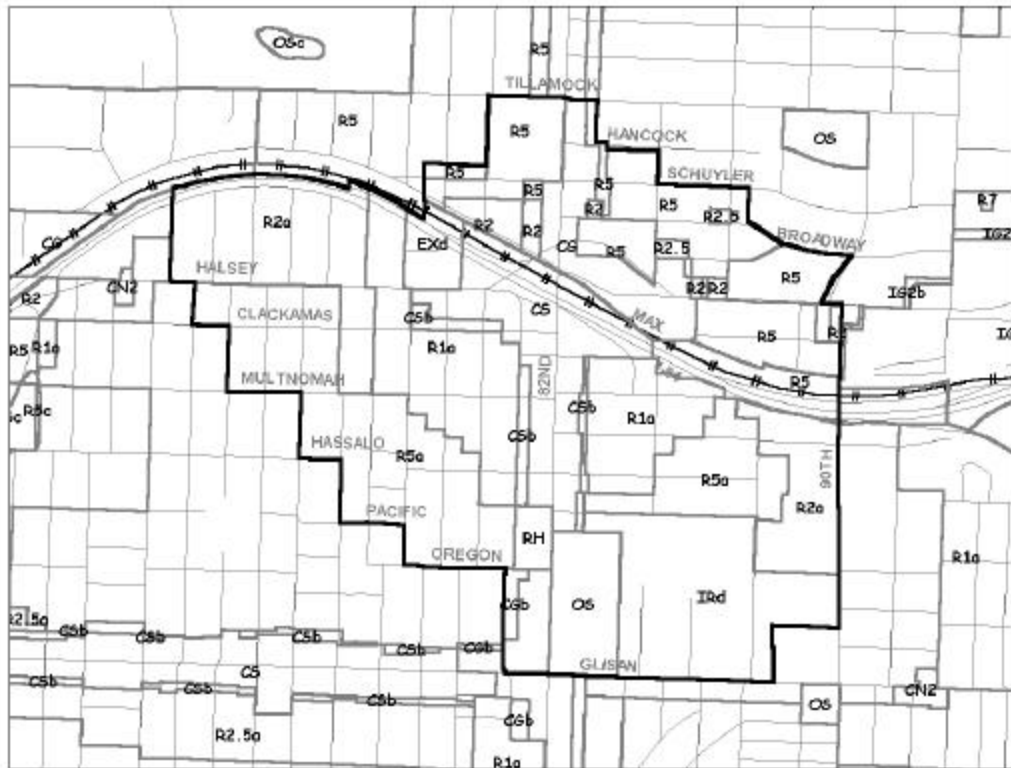
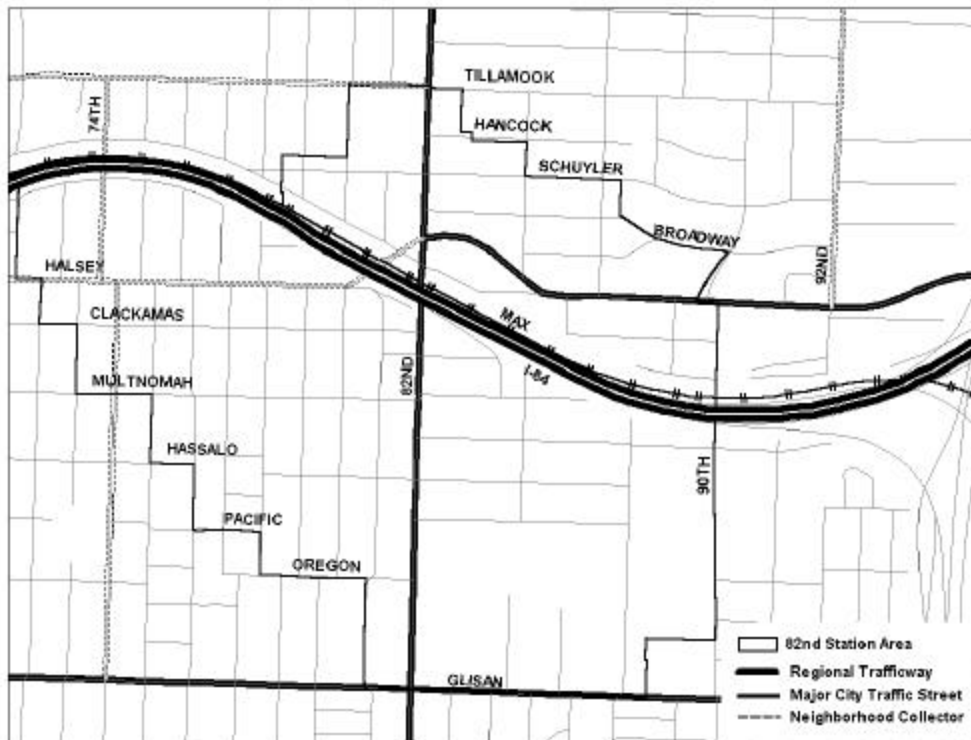


Figure 5-4: 82nd Station Area Traffic Street Classifications



Circulation

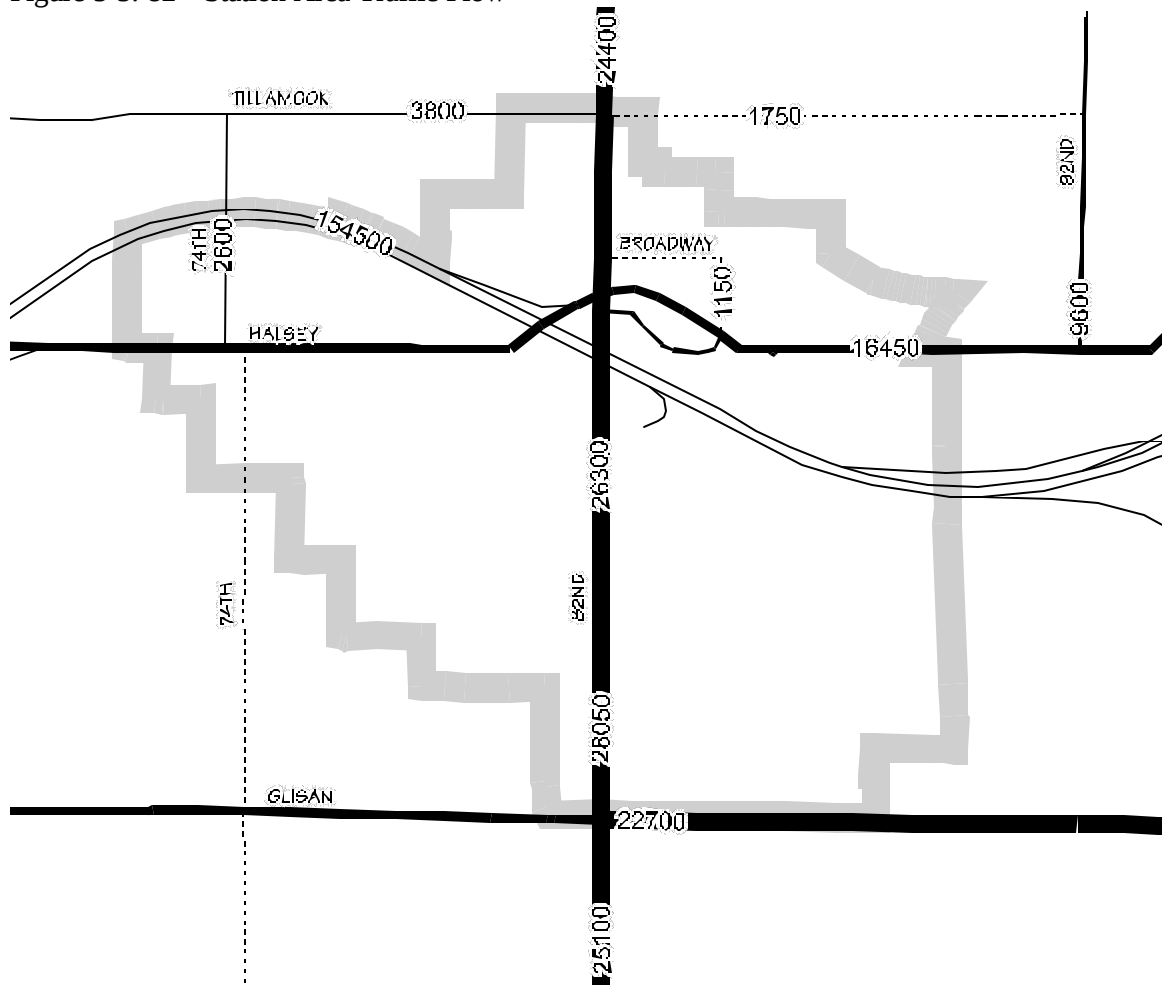
The 82nd Station Area is similar in form to the 60th Station Area. The I-84 freeway bisects the area, creating two distinct halves. It has a traditional grid street pattern with good street connectivity. The average length between street connections is 638 feet.

Traffic

Figure 5-4 shows the traffic street classifications and Figure 5-5, the traffic flow volumes for primary streets in the 82nd Station Area. NE 82nd, NE Glisan, and NE Halsey (east of 82nd) are classified as a Major City Traffic Streets, providing inter-district circulation. NE Halsey (west of 82nd), NE Tillamook, and NE 74th are Neighborhood Collectors, intended to provide more intra-district circulation. NE 82nd and NE Glisan carry high volumes of vehicle traffic through the station area.

The station area has partial access to the I-84 freeway. An eastbound off-ramp connects to NE Multnomah and a westbound on-ramp connects at NE Halsey.

Figure 5-5: 82nd Station Area Traffic Flow

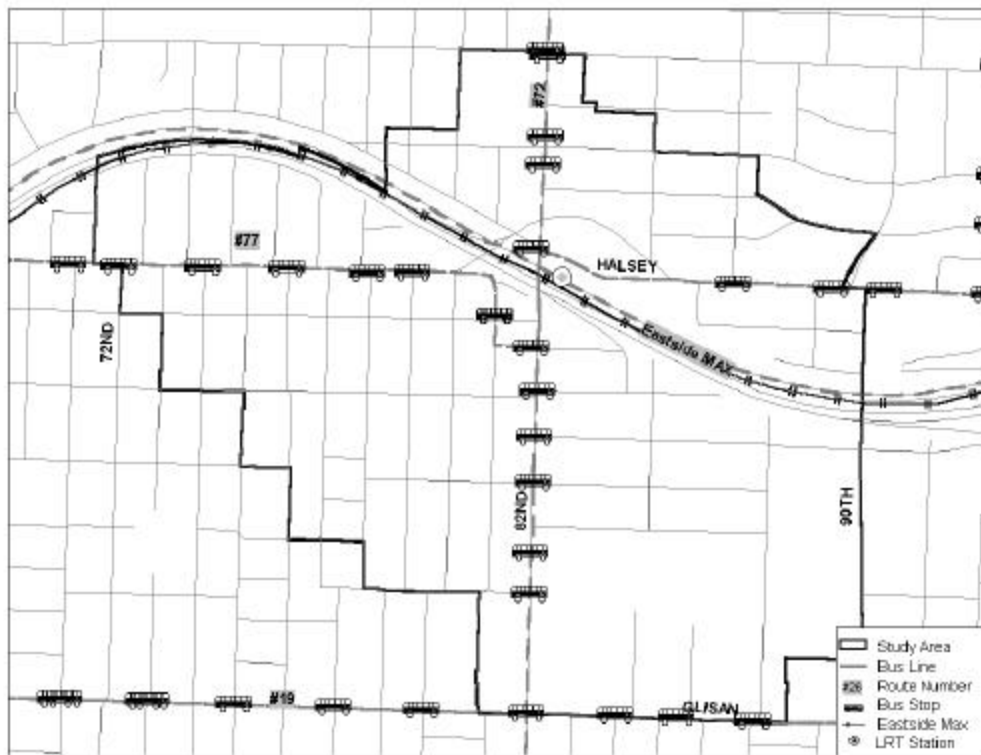


Transit Service

The 82nd Station Area is focused on the Eastside MAX Light Rail Station at 82nd and I-84. Eastside Max provides regional service from downtown Gresham to downtown Portland and continued service along the Westside MAX alignment to Beaverton and Hillsboro. Service to downtown Portland at the 82nd station begins at approximately 4:25am and continues until 2:00am. MAX trains run at a high frequency throughout the day. Trains average seven and one half-minute headways in the peak hour and ten-minute headways in non-peak hours.

In addition to light rail service, three Tri-Met bus routes service the 82nd station area: Routes #72, #77 and #19. Figure 5-6 maps the routes and stops in the station area. Routes #72 and 77 provide direct connector service to the light rail station at 82nd Avenue. Route #72 originates in the Swan Island industrial district, travels along N and NE Killingsworth and then connects to the 82nd station area after travelling south along 82nd Avenue. Service for this route begins at 5:00am and continues at 15-minute headways until 1am.

Figure 5-6: 82nd Station Area Transit Service



Route #77 originates at the Gateway Transit Center and travels through the 82nd Station Area along NE Halsey. This route connects the station area with Hollywood Town Center, the Rose Quarter and NW Portland. The route operates at 15-minute headways between 5:00am and 9:45pm.

Route #19 runs along the southern boundary of the 82nd study area on NE Glisan. It connects Gateway Transit Center with downtown Portland along NE Glisan and E. Burnside. Since a direct connection is not made at the 82nd light rail station, Route 19 does not serve as a feeder route to the East Side MAX but acts rather as complimentary

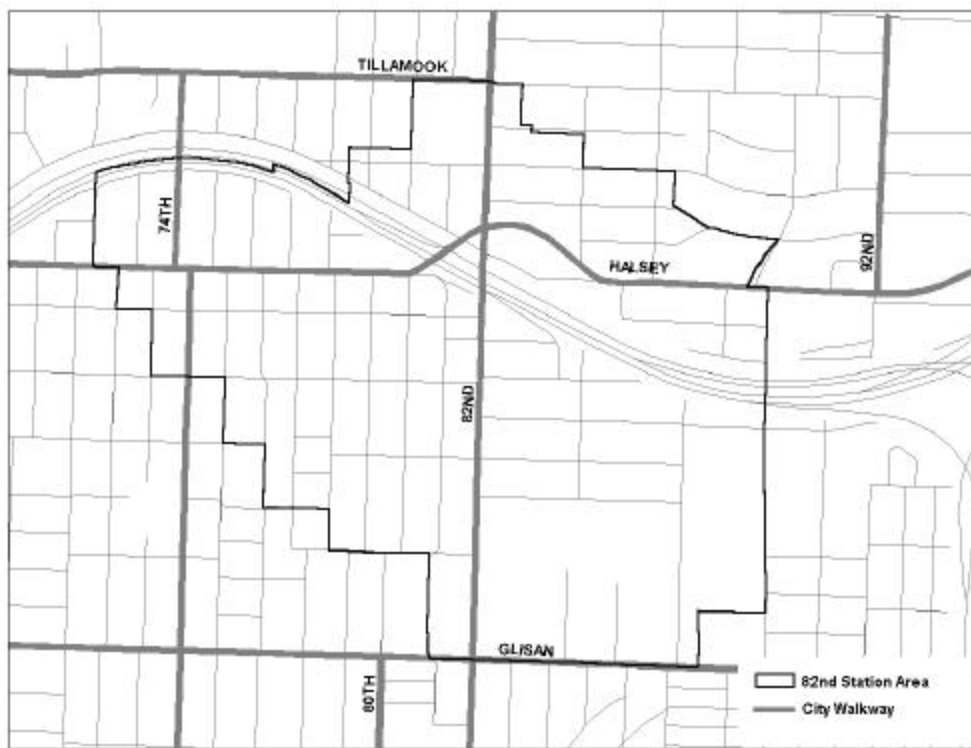
transit service to the area. The route provides service at 15-minute headways between 5am and midnight.

Pedestrians

Figure 5-7 shows the streets classified as City Walkways in the area. The majority of street segments are improved with sidewalks along both sides of the street. The streets classified as City Walkways are generally improved with curbs and sidewalks. The local streets tend to have interruptions in the sidewalk network.

Figure 5-8 maps the location of traffic signals and marked pedestrians crossings found in the station area.

Figure 5-7: 82nd Station Area Pedestrian Street Classifications



Bicycles

Figure 5-9 shows the bicycle network for this station area. Currently, no streets in the station area have been upgraded with bicycle facilities. The Tillamook Bikeway Project, which creates a continuous bike-friendly route along NE Tillamook between N. Flint to NE 92nd, is in its implementation phase.

Figure 5-8: 82nd Station Area Traffic Signals

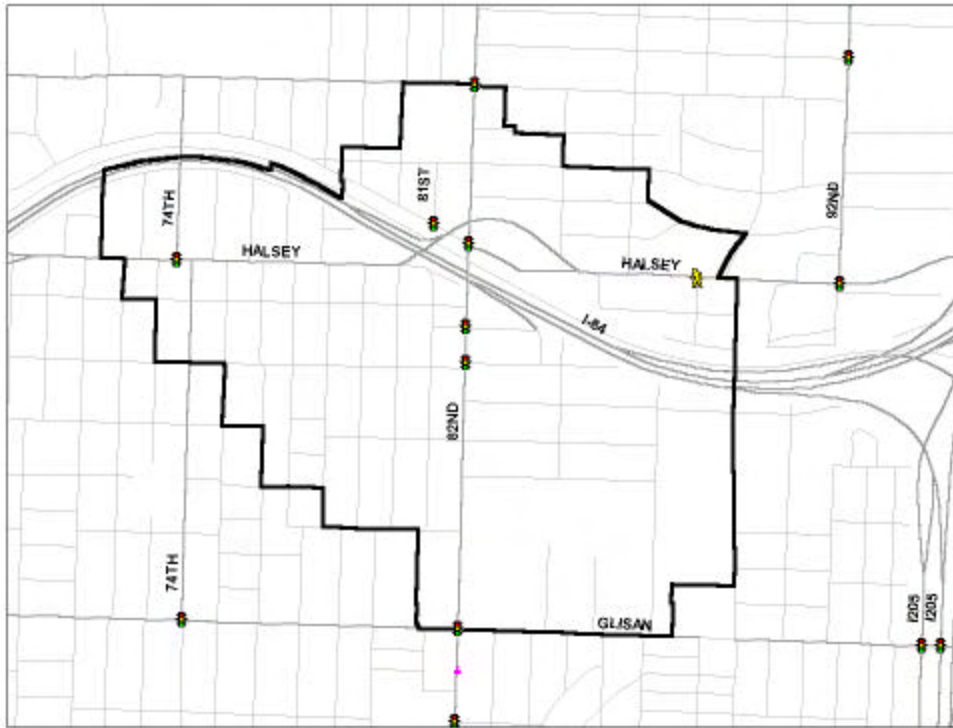
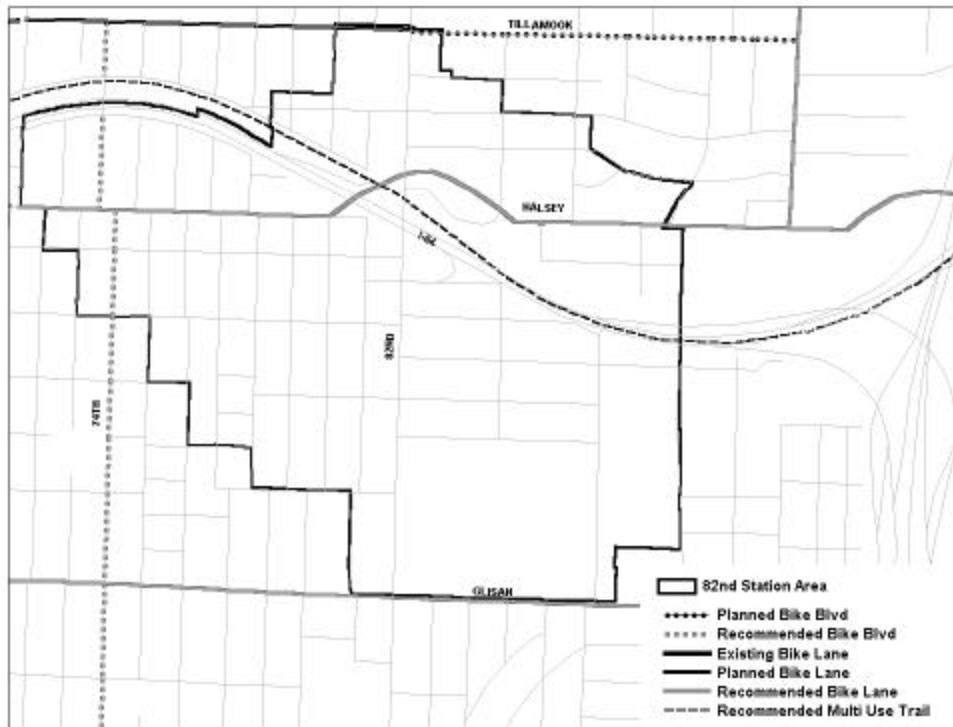


Figure 5-9: 82nd Station Area Bicycle Network

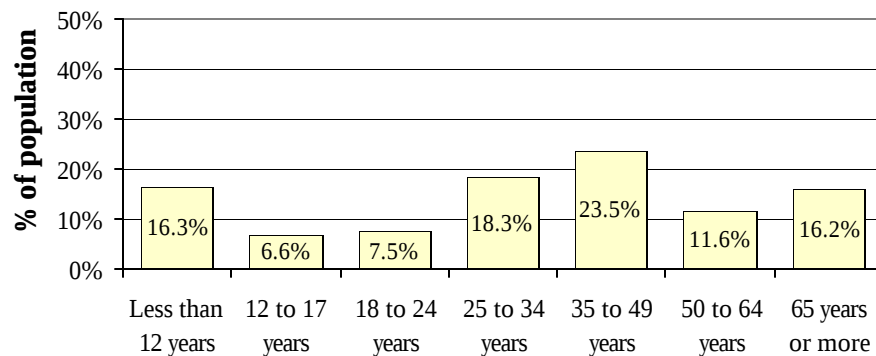


POPULATION AND HOUSEHOLD CHARACTERISTICS⁶

Age Distribution

As of 1996, area residents from 35 to 49 years of age are the largest age group, making up 23.5% of the population. There are also a large percentage of children and adolescents; 22.9% of residents were under age 18. The remaining percentages ranged from 7.5% in the 18 to 24 years age group to 18.3% in the 25 to 34 year age group.

Figure 5-10: Age Distribution



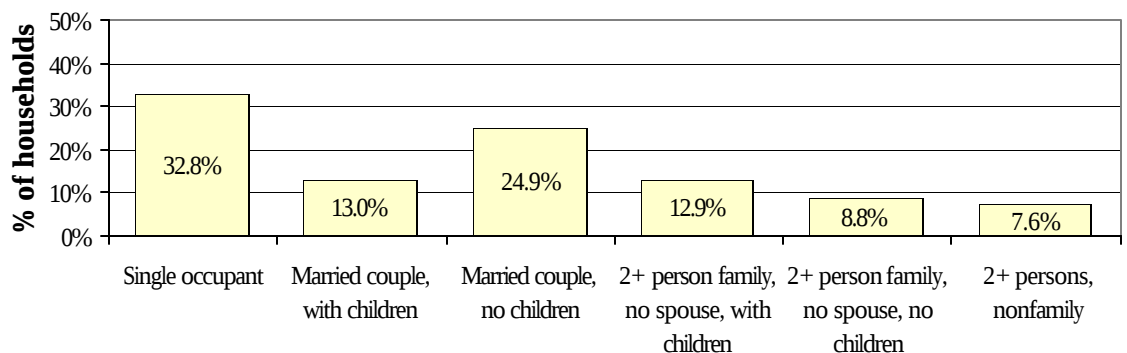
(Source:

1996 American Community Survey)

Household Size and Type

The largest share of households near the 82nd Avenue station (32.8%) were single occupants, with married couple households without children comprising the next most common household type (24.9%). Almost 22 percent of the total households were families with 2 or more persons and no spouse present and, of these, 12.9% had children and 8.7% did not. Thirteen percent of the households were married couples with children and only 7.6 percent were non-family households with 2 or more persons.

Figure 5-11: Household Size and Type



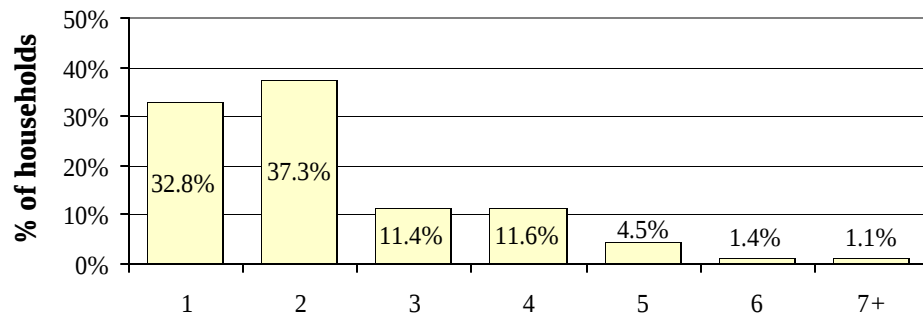
⁶ Since data is reported on the basis of block groups, the following medians and percentages are based on block group medians and totals.

(Source: 1996 American Community Survey)

Persons Per Household

As of 1996, the majority of households in the area (70.1%) were made up of only 1 or 2 persons (32.8% and 37.3% respectively). The remaining household sizes make up a relatively smaller share of the households; 11.4 percent have 3 persons, 11.6 percent have 4 persons, and only 7 percent of the households have 5 or more persons.

Figure 5-12: Persons Per Household

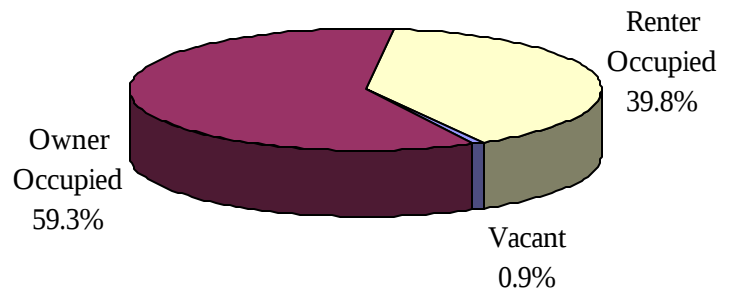


(Source: 1996 American Community Survey)

Tenure and Occupancy Status

As of 1996, most of the housing in the 82nd Avenue station area was occupied by home owners (59.3%), with renter occupied housing making up 39.8 percent of the total housing stock. Less than one percent of the housing units were vacant.

Figure 5-13: Tenure and Occupancy Status

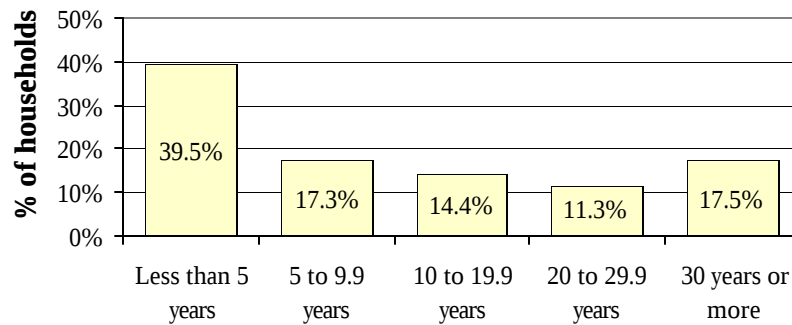


(Source: 1996 American Community Survey)

Length of Residence

Nearly forty percent of the residents near the 82nd Avenue station moved to the area within the 5 years prior to 1996, which may be correlated to the similar percentage of renters in the area. The other large length of residency proportions is for those who have been in the area for 30 years or more (17.5%) or for 5 to 9.9 years (17.3%). Over 14 percent have lived in the area for 10 to 19.9 years and 11.3 percent for 20 to 29.9 years.

Figure 5-14: Length of Residence

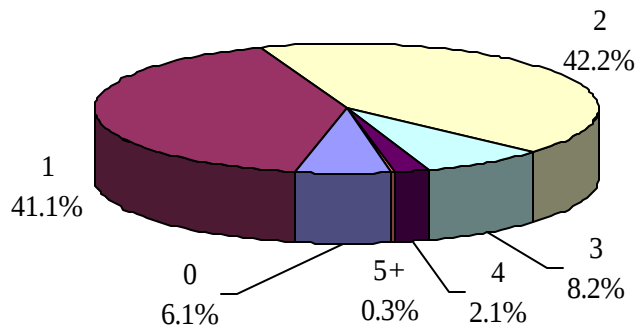


(Source: 1996 American Community Survey)

Vehicle Availability

In 1996, approximately 85 percent of households near the 82nd Avenue station had 1 or 2 vehicles available for use. Single vehicle households accounted for 41.1% and 2-vehicle households for 42.2 percent. Of the remaining households, 8.2% had 3 vehicles, 6.1% had no vehicle available fewer than 2.4% had four vehicles or more.

Figure 5-15: Vehicles Per Household



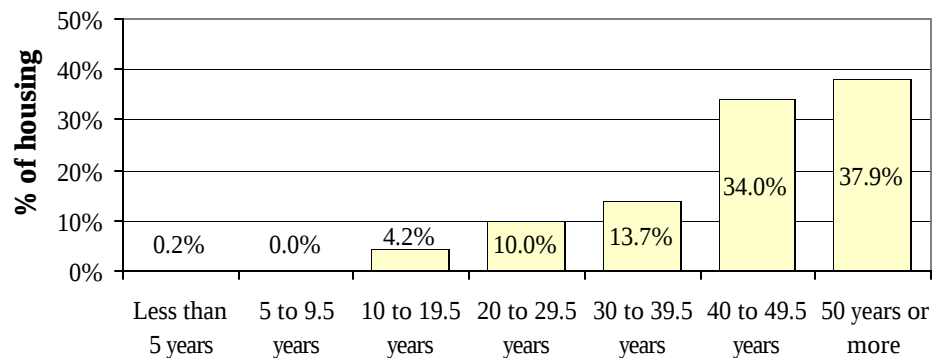
(Source: 1996 American Community Survey)

Housing Characteristics

Age of Housing

The large majority of the housing in the 82nd Avenue station area (71.9%) was constructed prior to 1956. Following this extensive period of housing development, the share of construction dropped to 13.7% from 1957 to 1966 and 10% from 1967 to 1976. Less than five percent of the housing structures were built after 1976.

Figure 5-16: Age of Housing Structure



(Source: 1996 American Community Survey)

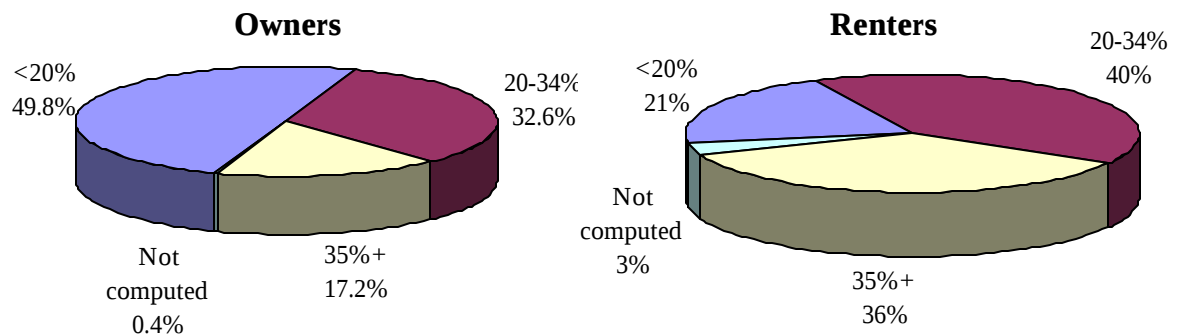
Housing Costs

In 1996, according to the American Community Survey, the median house value near the 82nd Avenue station was \$94,500. The median contract rent for residential housing was \$509 per month.

Housing Costs as a Percentage of Household Income

Based on 1996 figures, approximately one-half of homeowners in the area (55.1%) spend less than 20 percent of their household income on housing. Nearly 33% spend between 20-34 percent of their income on housing and 17.8% spend 35 percent or more of their income. Only 21% of renters, on the other hand, spend less than 20 percent of their income on housing, while 40% spent between 20-34 percent and 36% spend 35 percent or more.

Figure 5-17: Owner vs. Renter Housing Costs as a Percentage of 1996 Household Income



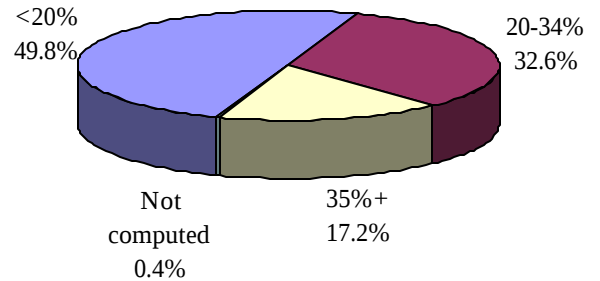
(Source: 1996 American Community Survey)

Employment Characteristics

Workers per Family

As of 1996, one- and two-worker families were predominant in the 82nd Avenue station area; 33.7% of the families had one worker and 34.9% had two. Of the remaining families, nearly 20 percent had more than two and 13.5 percent had no workers in the family?

Figure 5-18: Workers Per Family



(Source: 1996 American Community Survey)

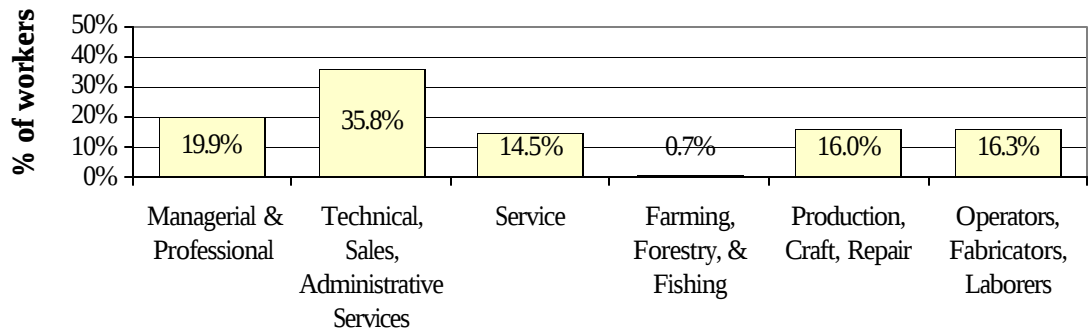
Household Income

According to American Community Survey data, the median 1996 adjusted household income near the 82nd Avenue station area was \$30,413.

Occupation of Local Workforce

In 1996, the predominant worker occupations in the 82nd Avenue station area were technical, sales and administrative (35.8%). The most minor occupations, employing only 0.7% of the area workforce, were farming, forestry and fishing. The remaining occupations were fairly evenly represented. Almost 20% of the workforce is classified as managerial and professional; 16.3% work as operators, fabricators or laborers; 16% in production, craft or repair; and 14.5% in service occupations.

Figure 5-19: Occupations



(Source: 1996 American Community Service)

Place of Work for Area Residents

Most of the local residents (84%) work in Multnomah County, with nearly all of those employed in the City of Portland (73.3%). Only 2.8 % of residents commute outside the Portland metropolitan region.

Figure 5-20: Place of Work: State and County

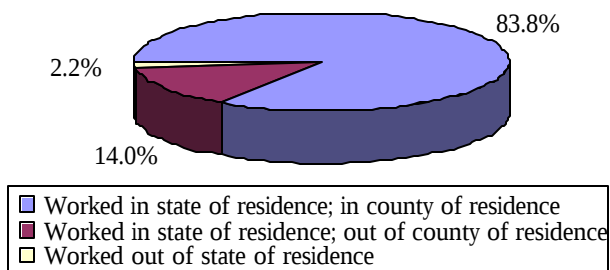
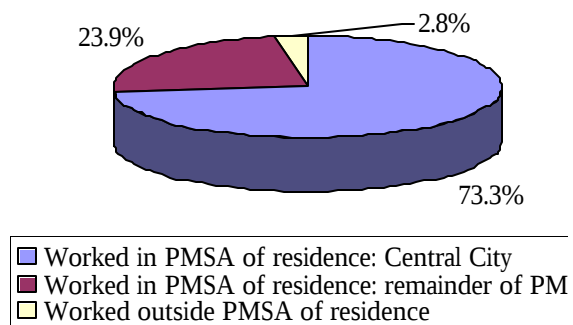


Figure 5-21: Place of Work, PMSA



(Source: 1996 American Community Survey)

Descriptor Values

The baseline descriptors' values for the 82nd Station Area are list below.

Density

The density descriptors measure the intensity of development in an area. The calculation of density is based on net acreage. The net acreage in 82nd Station Area is 186 acres.

- ◆ Single Family Density = 4 dwelling unit per net acre
- ◆ Multi family Density = 2 dwelling units per net acre
- ◆ Total residential density = 6 dwelling units per net acre
- ◆ Total employment density = 7 employees per net acre

Diversity

The diversity descriptors measure the mix of uses in an area.

	Number of Uses	% of Total Land Use Area within Center
Detached Residential	798	57%
Attached Residential	385	11%
Key Commercial Activities	18	2%
Schools	2	8%
Community Center/Library	1	1%
Parks and Open Space	1	4%

Design

The design descriptors measure street and building characteristics.

The following descriptors relate to the street design:

- ◆ Intersection density = 8.3 intersections per mile
- ◆ Percentage of street segments with sidewalks along both sides of the street = 68%
- ◆ Percentage of designated bicycle facilities built to date = 0%

Forty commercial properties were evaluated on transit/pedestrian friendliness. The criteria used to evaluate each property include:

1. Building setback within 25 feet of the transit/pedestrian street.
 2. No vehicle parking between the transit/pedestrian street and building.
 3. Main entrance to the building orientated to the transit/pedestrian street.
- ◆ Percentage of properties meeting three criteria = 22%
 - ◆ Percentage of properties meeting two criteria = 30%
 - ◆ Percentage of properties meeting one criterion = 38%
 - ◆ Percentage of properties meeting none of the criteria = 10%

Transit Service

The transit service descriptors measure the quality of transit service in the area.

- ◆ Number of lines serving the area = 4

Route	Peak Hour Headway	Mid-day Headway	Service Hours
MAX	7.5 minutes	10 minutes	21 hours
19	15 minutes	15 minutes	19 hours
72	15 minutes	15 minutes	20 hours
77	15 minutes	15 minutes	16.75 hours

Transportation Demand Management

The transportation demand management descriptor is a tally of employer TDM programs in the area.

- ◆ Number of employers subject to Eco-rule requirements = 3

Parking

The parking descriptors measure the availability and cost of area parking.

- ◆ Average cost of parking per hour = \$0.00
- ◆ Average off-street parking spaces per 1000sf of commercial use = 2.3 spaces/1000sf

Demographics

The demographic descriptors measure key socio-economic patterns in the area.

- ◆ Median income = \$30,413

◆ Household Size

Number of Persons in Household	Percentage
1 Person	33%
2 Persons	37%
3 Persons	11%
4 Persons	12%
5 Persons	5%
6 Persons	1%
7 or More Persons	1%

◆ Household Workers

Number of Workers in Household	Percentage
0 Workers	13%
1 Worker	34%
2 Workers	35%
3 or More Workers	18%

◆ Vehicle Ownership

Number of Vehicles	Percentage
No Vehicles	6%
1 Vehicle	41%
2 Vehicles	42%
3 Vehicles	8%
4 Vehicles	2%
5 or More Vehicles	0%

Travel Profile

The 82nd Station Area travel profile is based on 1994 travel behavior data from Metro's transportation analysis zones 721 and 771. This zone approximates the 82nd Station Area boundary.

In 1994, in estimated 21,763 person trips had origins or destinations within the area. Of the total trips, 2% were local to the area and 98% had an origin or destination outside of the zone. Table 5-2 shows the distribution of these trips by purpose. As with the other study areas, the largest percentage (46%) of trips fall into the Home-based Other category.

Table 5-2: 82nd Station Area Trip Distribution by Trip Purpose

Trip Purpose	% of Total Person Trips
Home-based Work Trips	20%
Home-based Other Trips	46%
Non-home-based Work Trips	9%
Non-home-based Non-work Trips	18%
College Trips	1%
K-12 School Trips	6%

Table 5-3 provides the distribution of mode splits for each purpose. Predictably, the drive alone category captures the greatest share of trips for all modes with the exception of College and School.

Table 5-3: 82nd Station Area Mode Split by Trip Purpose

Trip Purpose	Drive Alone	Shared Auto	Transit	Walk & Bike	School Bus
Home-based Work	72%	15%	8%	6%	0%
Home-based Other	58%	32%	3%	7%	0%
Non-home-based Work	63%	35%	1%	1%	0%
Non-home-based Non-work	63%	35%	1%	1%	0%
College	32%	18%	42%	8%	0%
K-12 School	3%	2%	19%	54%	22%

Figures 5-22 and 5-23 show the primary travel patterns between the 82nd Station Area and other transportation zones in the region. Of the total trips for the area, 46% originate in the station area and 54% come to the area from other zones. The largest percentage (12%) of trips originating in 82nd Station Area go to the Gateway Regional Center zone. Generally, trips to and from the station area are concentrated in the zones east of the Willamette River.

Figure 5-22: Geographic Distribution of Trips Originating in the 82nd Station Area

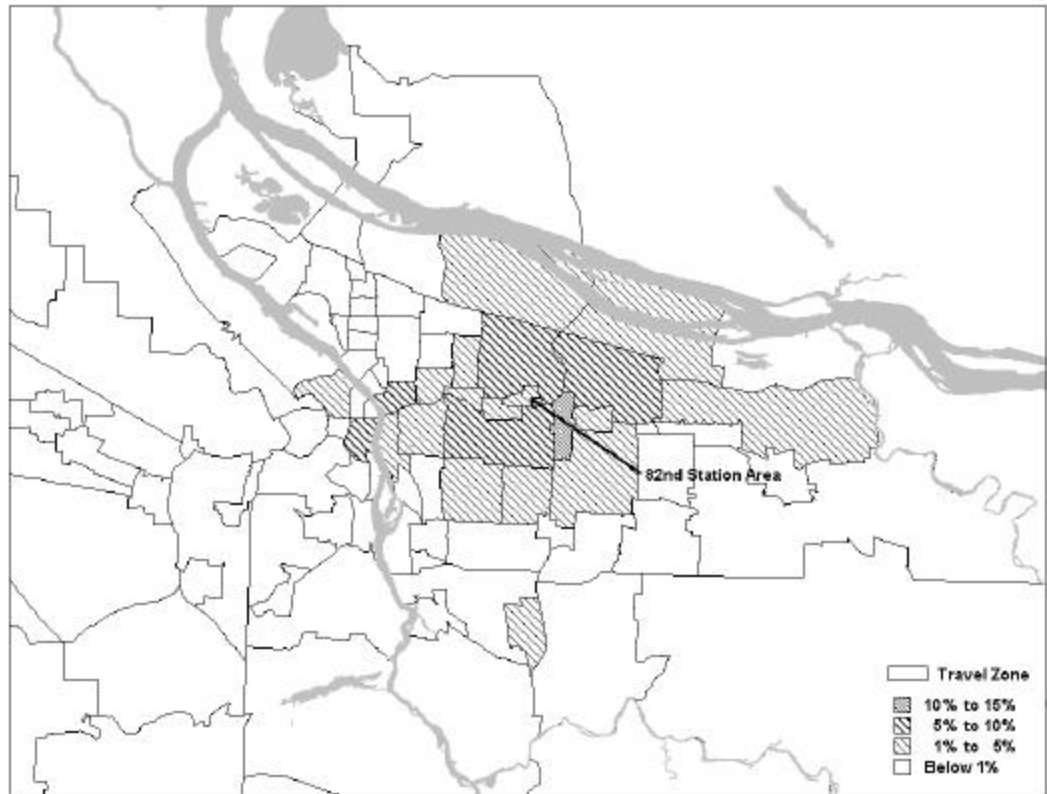
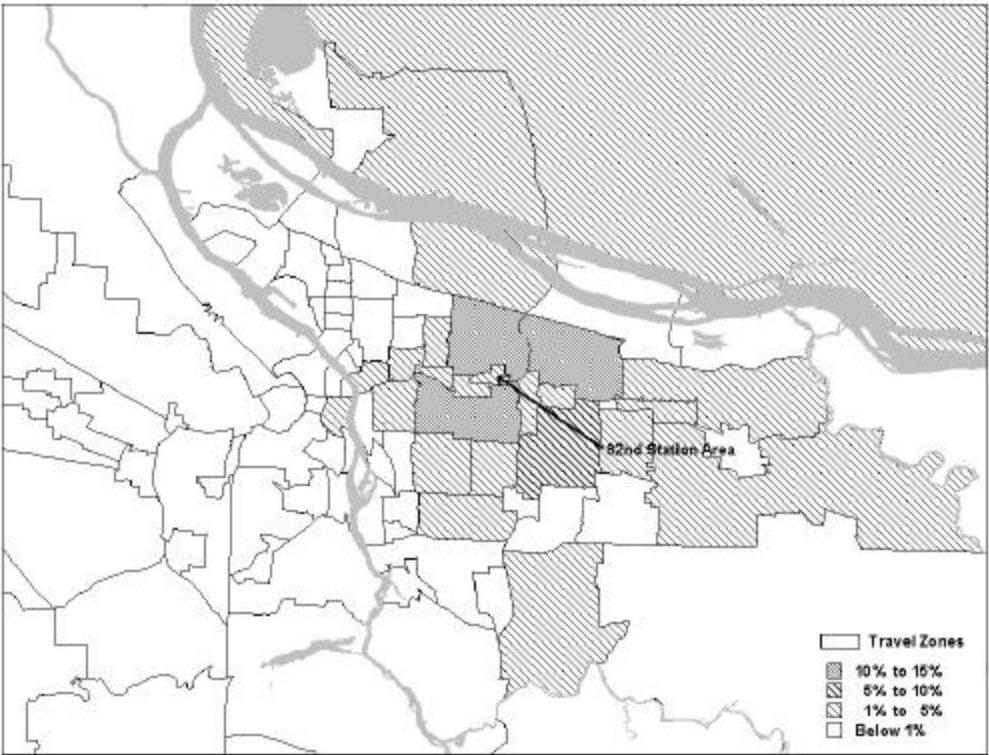


Figure 5-23: Geographic Distribution of Trips Destined for the 82nd Station Area



Case Study 6

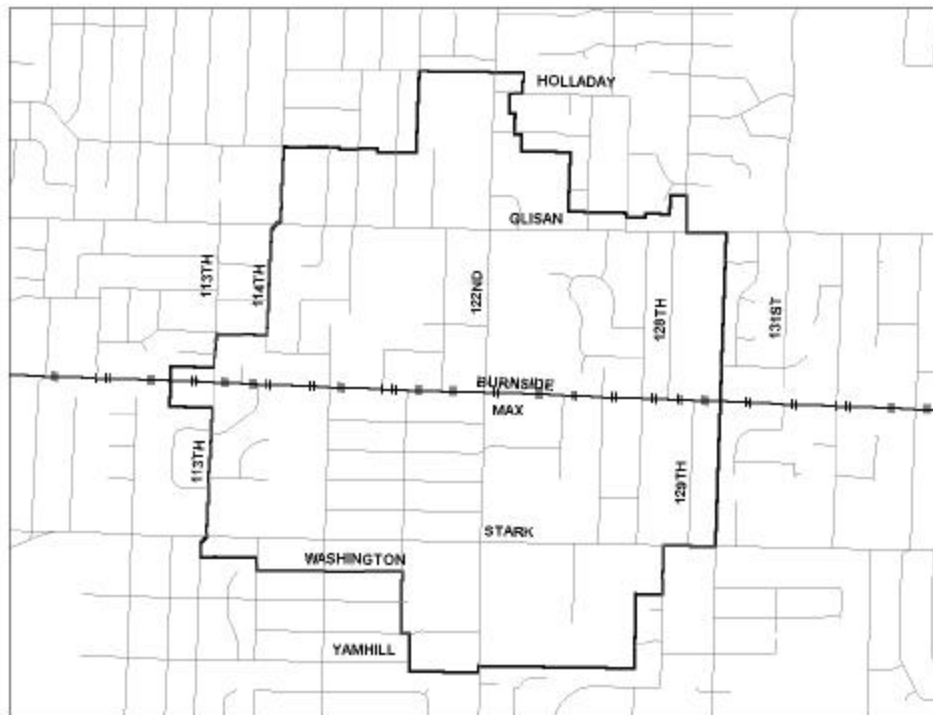
122nd Station Community

Study Area Profile

Location

The 122nd Station Area is centered on the Eastside MAX station at NE 122nd Avenue and East Burnside. The station area extends north to NE Holladay, south to SE Taylor, east to 130th, and just past 113th to the west. The station area is included in two neighborhoods. The area north of SE Stark lies in the Hazelwood neighborhood and south of SE Stark, in the Mill Park neighborhood.

Figure 6-1: 122nd Station Area Vicinity Map

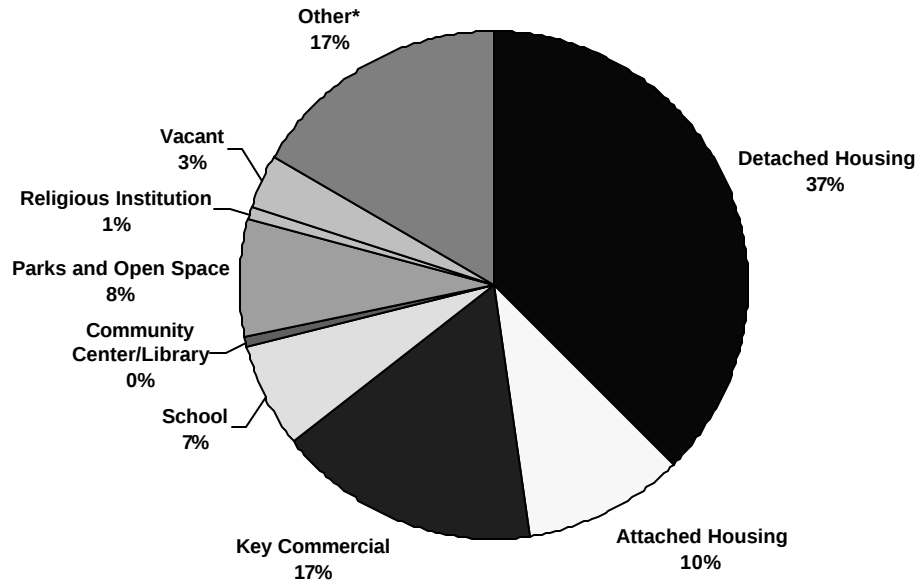


Land Use

Current Land Use Pattern

Figure 6-2 charts the land use distribution for the 122nd Station Area. A large concentration of commercial, retail, and service establishments (with some industrial and institutional) runs north-south through the station area along 122nd and east-west along NE Glisan and SE Stark. Most of the residential housing units are located in the eastern and western sections of the station area, divided roughly in half by the mixed-use activity along 122nd Avenue. Scattered throughout the station area are institutional land-uses, open space, and vacant parcels.

Figure 6-2: 122nd Station Area Land Use Distribution



* Other category includes Vehicle Services, Industrial uses, Commercial and Retail uses not identified as key commercial, and Institutional Uses excluding schools, civic uses, and religious uses.

Table 6-1 shows the mix and number of key commercial activities located in the center. The station area has a good mix of commercial activities located along the length of 122nd, and along NE Glisan and SE Stark for several blocks either side of 122nd. The character of the commercial area is primarily auto-oriented, strip commercial. The design assessment found that more than half the buildings were auto-oriented in design.

Table 6-1: Distribution of Key Commercial Activities in 122nd Station Area

Key Commercial Categories	Number of Establishments
Grocery	4
Drug Store	1
Restaurant	15
Personal Services	12
Retail Goods	21
Professional Services	14

In terms of employment, the station area had approximately 2,014 employees. Three of the employers in the area were subject to Eco-rule commute option requirements.

Zoning

Figure 6-3 shows the current zoning found in the 122nd Station Area. The station area lies in the Outer Southeast Community Plan boundary. The plan, adopted in 1996, updated the zoning around this station area to encourage higher density residential and neighborhood-serving commercial uses over time.

In comparison to the 148th Station Area, the zoning pattern is highly mixed with both commercial and residential zones. The residential zoning ranges from R5, which allows up to 8.7 units per acre, to RH, allowing up to 125 units per acre. The commercial zoning is a mix of Storefront Commercial (CS) with nodes of the more auto-oriented General Commercial (CG) on NE Glisan and SE Stark. The zoning adjacent to the MAX station is Storefront Commercial and Mixed Commercial/Residential (CM), intended to promote the development of ground floor commercial with residential on the upper levels.

The station area has two parks. Two acre Midland Park is located behind the Midland Library at SE 82nd and SE Morrison. Ventura Park, 7 acres, is located on SE Stark west of SE 122nd. Glendovere Golf Course is located just outside of the station area boundary at NE 122nd and NE Glisan.

The station area has two elementary schools, Menlo Park and Ventura Park .The Midland Library is located on SE 122nd at SE Morrison. The Multnomah County Sheriff Office is located at the intersection of NE 122nd and NE Glisan. The Menlo Park and Ride lot is located at the MAX station on E Burnside. The lot has 391 spaces.

Circulation

The 122nd Station Area is characterized by an incomplete street grid system. There are many dead end streets and blocks tend to be large and irregularly shaped. The average length between street connections is 693 feet.

Traffic

Figure 6-4 shows the traffic street classifications and Figure 6-5 maps the traffic volumes for primary streets in the 122nd Station Area. NE/SE 122nd, NE Glisan, and SE Stark serve as the primary traffic streets in the area. These three roadways operate as inter-district connectors, carrying relatively high volumes of traffic through the station area. E Burnside functions as more of a neighborhood circulator.

Figure 6-4: 122nd Station Area Traffic Street Classifications

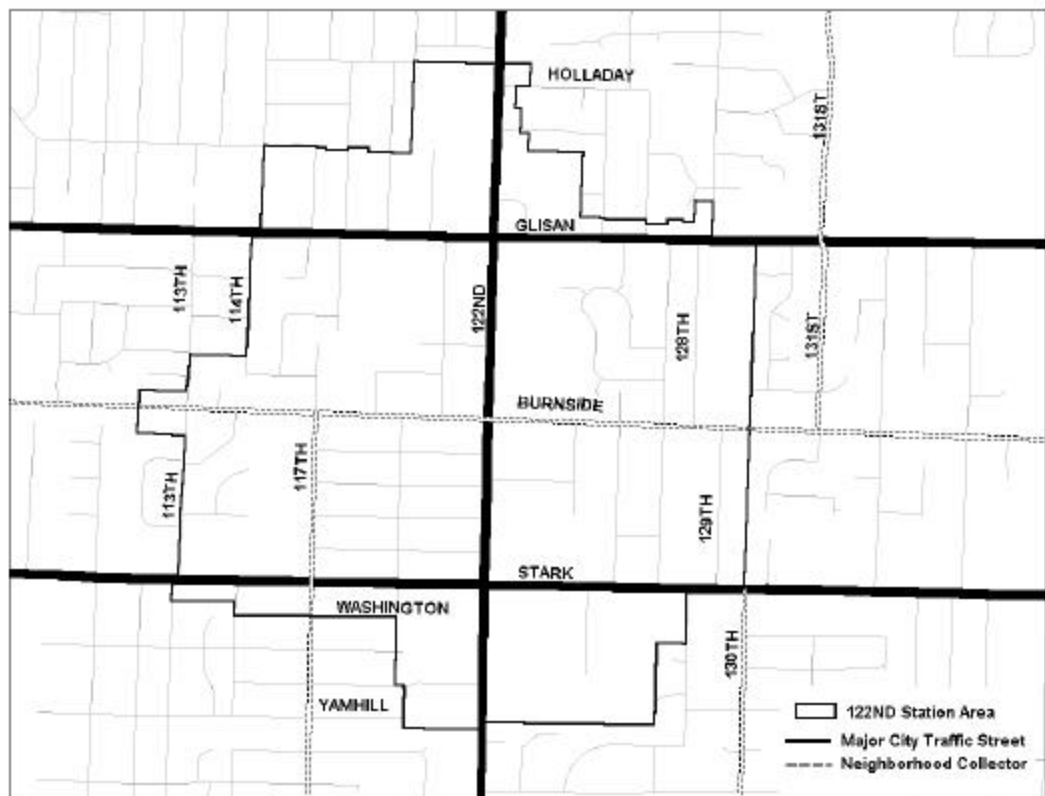
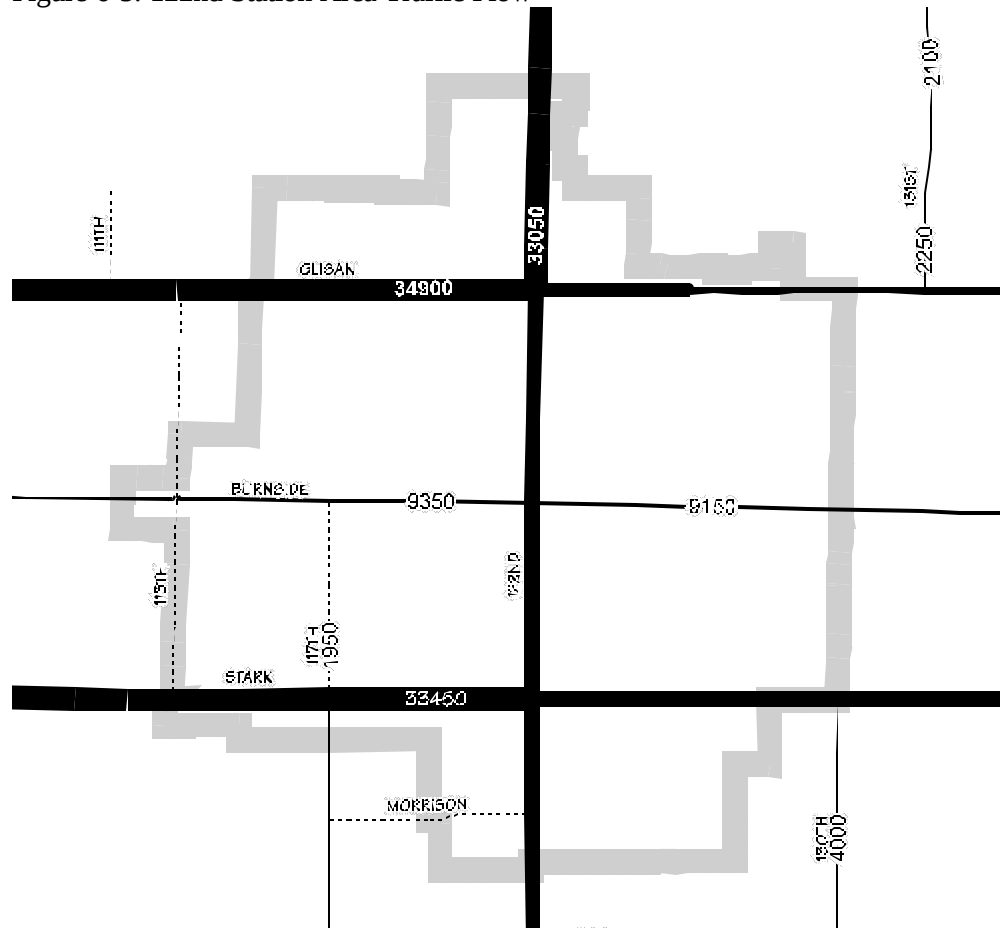


Figure 6-5: 122nd Station Area Traffic Flow

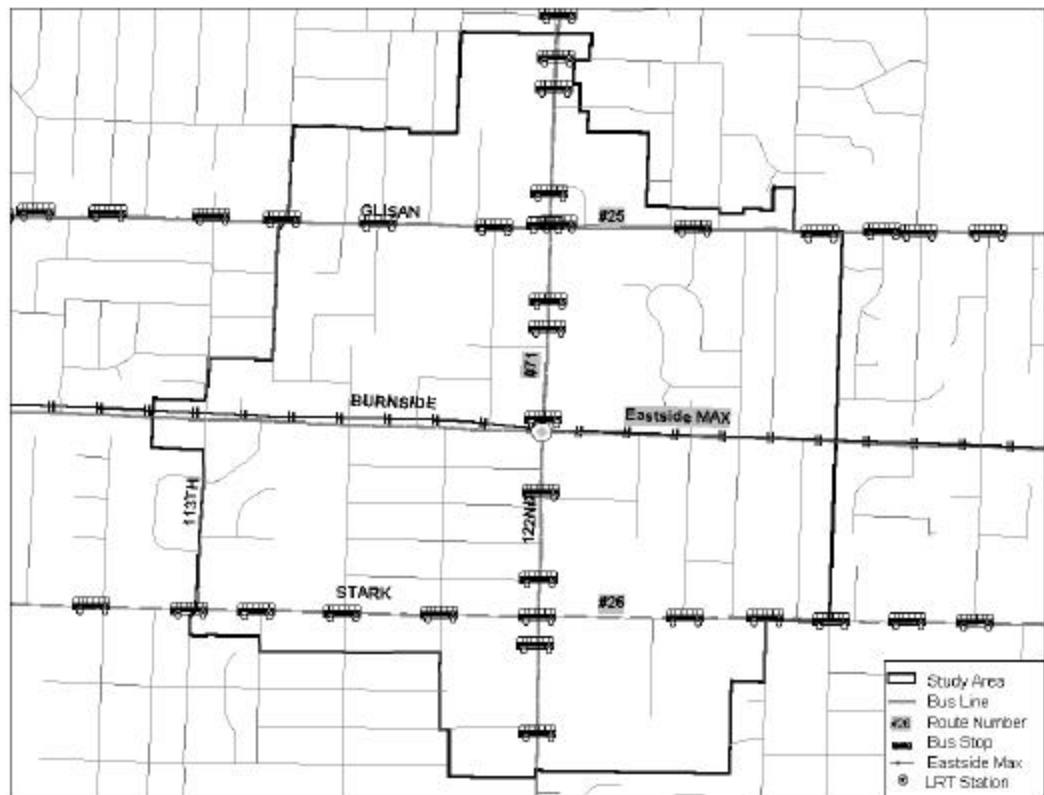


Transit Service

The 122nd Station Area is focused around the Eastside MAX Light Rail Station at 122nd and East Burnside. Eastside Max provides regional service from downtown Gresham to downtown Portland and continued service along the Westside MAX alignment to Beaverton and Hillsboro. Service to downtown Portland begins at approximately 4:15am and continues until 1:40am. MAX trains run at a high frequency throughout the day. Trains average seven and one half-minute headways in the peak hour and ten- minute headways in non peak hours.

In addition to Light Rail Service, 122nd is serviced by three Tri-Met bus routes: Route #25, #26 and #71. Figure X maps the transit routes and stops in the station area. Both Route #25 and #26 are designed to provide local connecting service to the Eastside MAX Light Rail. Route #25 originates at the Rockwood Transit Center at 188th, runs parallel to the MAX Alignment along NE Glisan, and terminates at the Gateway Transit Center. Designed as an accessory service route, Route 25 provides only hourly service between 6:00am and 7:30pm.

Figure 6-6: 122nd Station Area Transit Service



Route #26 originates at the Gresham transit center, provides connecting service to Mt. Hood Community College, and runs parallel to the MAX Alignment along Stark to its terminus at the Gateway Transit Center. It provides service to the 122nd station area at 30 minute headways between 5:15am and 11:45pm.

Route #71 provides a north/south connection to 122nd station area. It originates in the Lents neighborhood at the intersection of 94th Avenue and SE Foster Road. The route then travels East along Foster Road and North along 122nd Avenue to its connection at the 122nd Light Rail Station. Route #71 provides continuing connecting service through NE Portland, reconnects with Eastside Max at 60th and proceeds to its terminus at Clackamas Town Center. Route 71 provides service from approximately 5:30am to 9:30pm at 15 minute headways throughout the day.

Pedestrians

Figure 6-7 shows the streets classified as City Walkways in the area and the Ventura Park Pedestrian District. Less than half of the street segments in the station area are fully improved with sidewalks. Of the streets identified as City Walkways, NE/SE 122nd, E Burnside, and SE Stark have continuous sidewalks along both sides of the street. NE Glisan and SE 117th have discontinuous sidewalks. SE 129th is largely unimproved with sidewalks. The Pedestrian District, intended to provide a high quality environment for walking, does not have a complete sidewalk network. With the exception of NE/ SE 122nd and E Burnside, sidewalks are absent.

Figure 6-7: 122nd Station Area Pedestrian Street Classifications

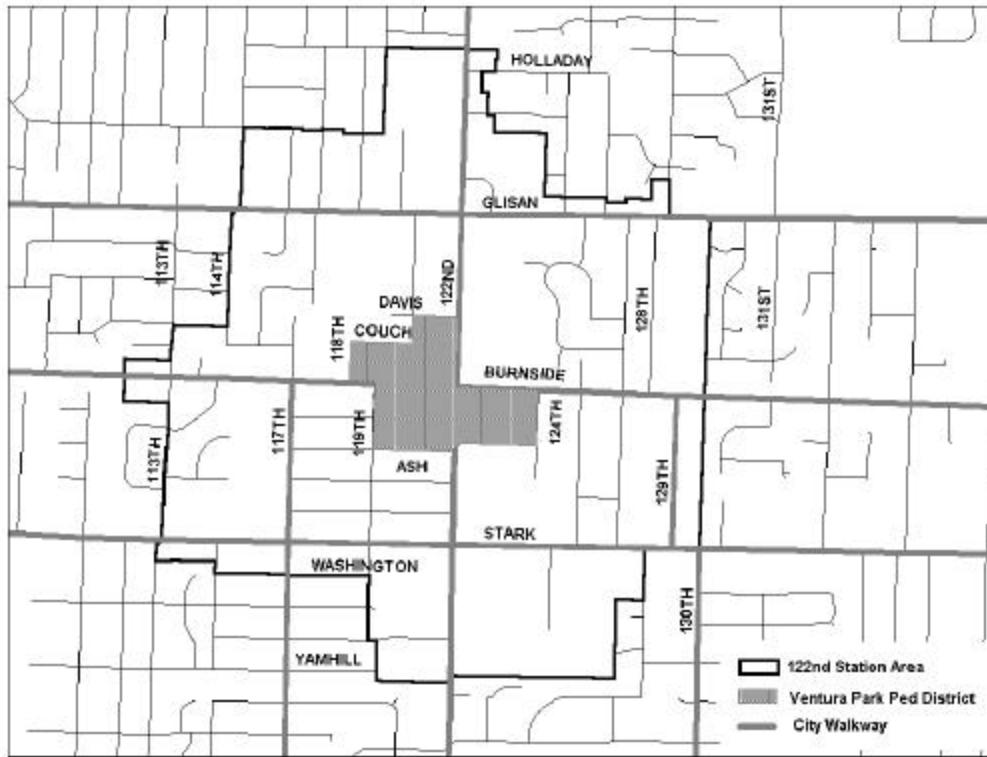


Figure 6-8: 122nd Station Area Traffic Signals

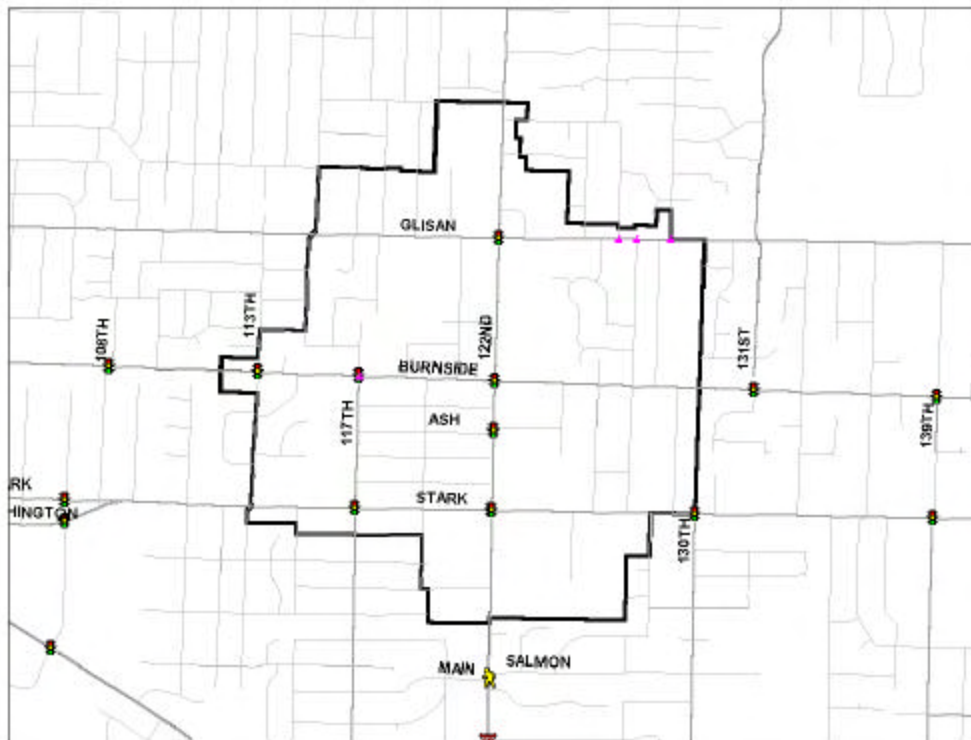
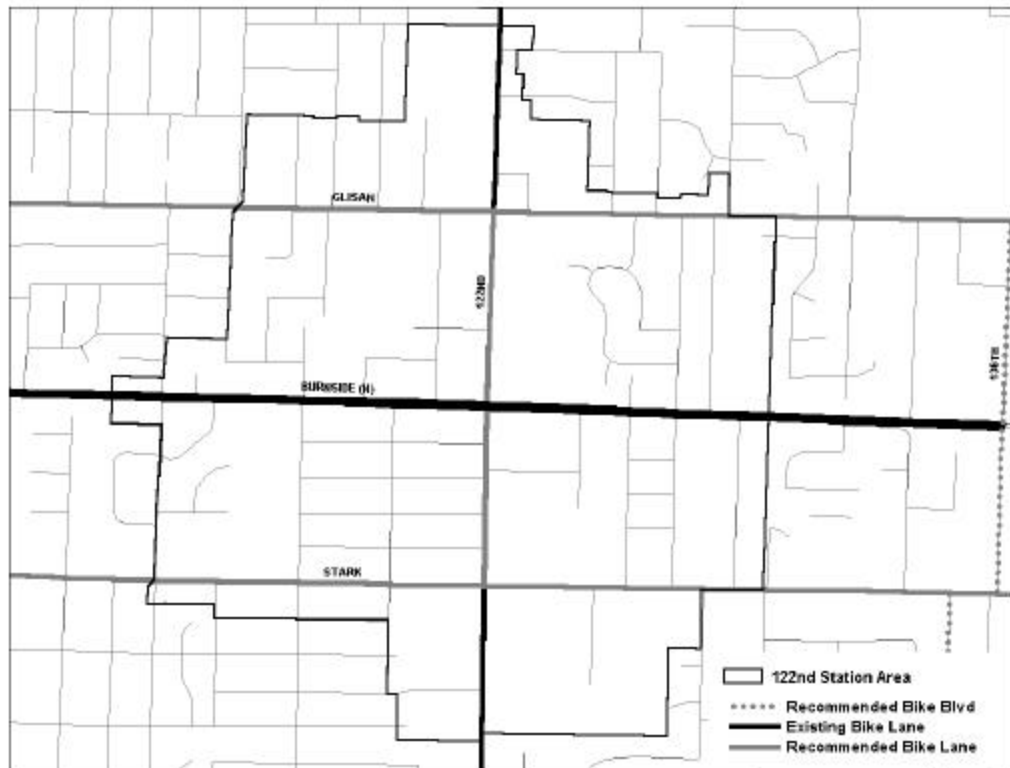


Figure 6-8 shows the locations of traffic signals and pedestrian crossings. The MAX tracks along E Burnside restrict crossing opportunities. However, people can cross the MAX tracks at SE 113th, SE Pine, SE 117th, SE 122nd, and Se 128th. The spacing between crossing opportunities ranges from 400 feet to 1500 feet.

Bicycles

Figure 6-9 shows the bicycle network for this station area. Currently, E Burnside is improved with striped bike lanes. NE 122nd down to NE Glisan has striped bike lanes. The section of SE 122nd, south of SE Stark is scheduled for striped lanes.

Figure 6-9: 122nd Station Area Bicycle Network

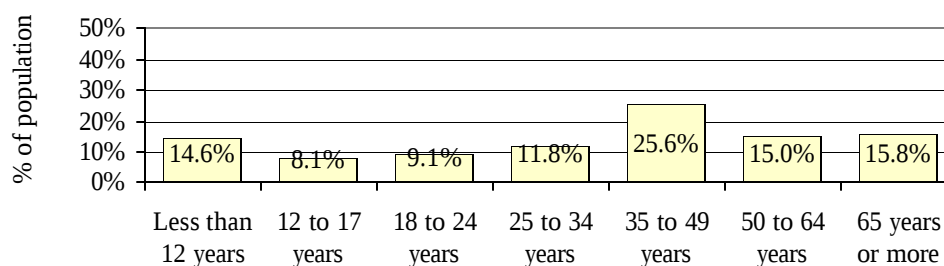


POPULATION AND HOUSEHOLD CHARACTERISTICS⁷

Age Distribution

As of 1996, the largest proportion of residents in the 122nd Avenue station area (25.6%) is between 35 to 49 years of age. Children (under age 18) represented the second largest share with 22.7% of the population. The rest of the population is fairly evenly distributed across the remaining age groups; 9.1% are between age 18 to 24, 11.8% age 25 to 34, 15% age 50 to 64, and 15.8% age 65 or older

Figure 6-10: Age Distribution

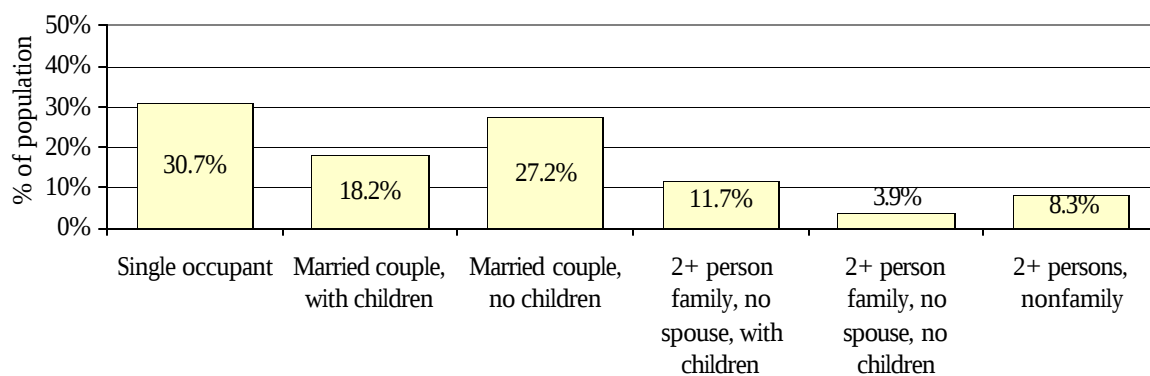


(Source: 1996 American Community Survey)

Household Size and Type

The household types that represented the largest percentage of households near the 82nd Avenue station are single occupants (30.7%) and married couples without children (27.2%). The next most common household type (18.2%) is married couple with children. Over 15 percent of the total households are families with 2 or more persons and no spouse present (11.7% had children, 3.9% did not). Just over 8 percent were non-family households with 2 or more persons.

Figure 6-11: Household Size and Type

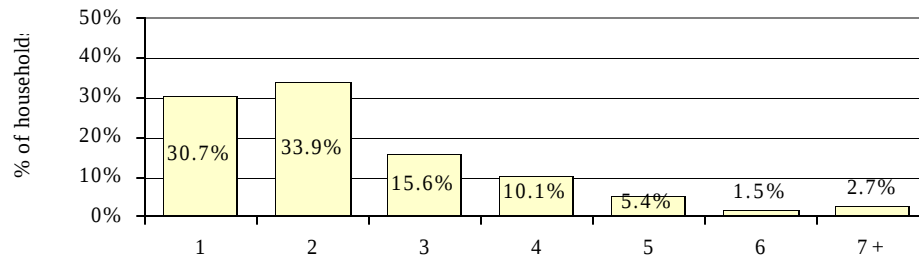


⁷ Since data is reported on the basis of block groups, the following medians and percentages are based on block group medians and totals.

Persons per Household

As of 1996, nearly 65 percent of households in the area consisted of only 1 or 2 persons (30.7% and 33.9% respectively). The next largest share were 3 person households, which represented 15.6% of the total. Just over 10 percent had 4 persons and fewer than 10 percent had 5 or more persons per household.

Figure 6-12: Persons per Household

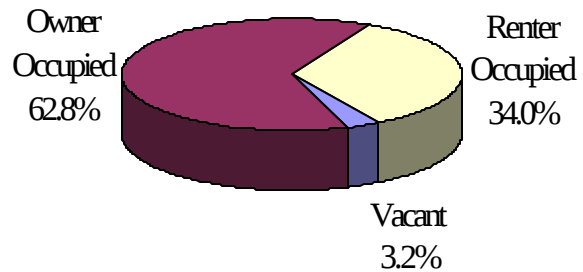


(Source: 1996 American Community Survey)

Tenure and Occupancy Status

As of 1996, a large majority of the housing units near the 122nd Avenue station are occupied by home owners (62.8%), with renter occupied housing making up 34 percent of the total housing stock. Over three percent of the housing units were vacant.

Figure 6-13: Tenure and Occupancy Status

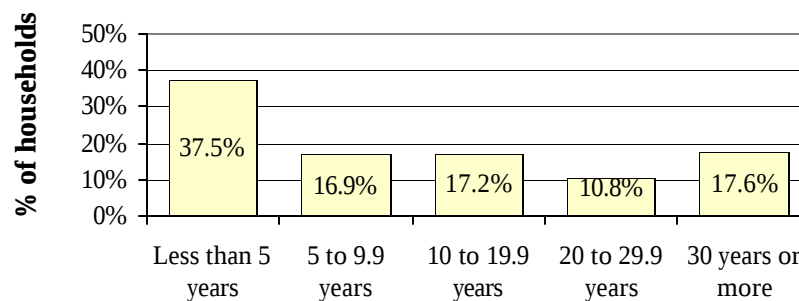


(Source: 1996 American Community Survey)

Length of Residence

As of 1996, 37.5 percent of the residents near the 122nd Avenue station had moved to the area within the last 5 years. The next highest lengths of residency were those who had been in the area for 30 years or more (17.6%), for 10 to 19.9 years (17.2%), and for 5 to 9.9 years (16.9%). Nearly 11 percent had lived in the area for 20 to 29.9 years.

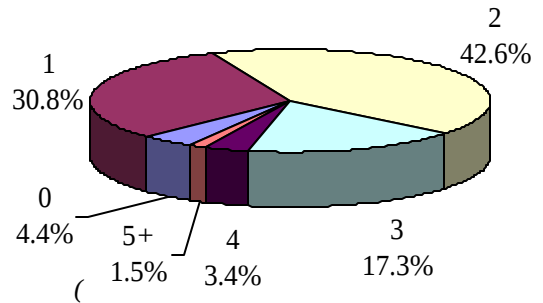
Figure 6-14: Length of Residence



Vehicle Availability

As of 1996, the largest share of households in the 122nd Avenue station area (42.6%) had two vehicles available for use. Also representing a high percentage (30.8%) were single vehicle households. Of the remaining households, 17.3% had 3 vehicles, 3.4% four vehicles, and 1.5% five or more vehicles; 4.4% had no vehicles.

Figure 6-15: Vehicles per household



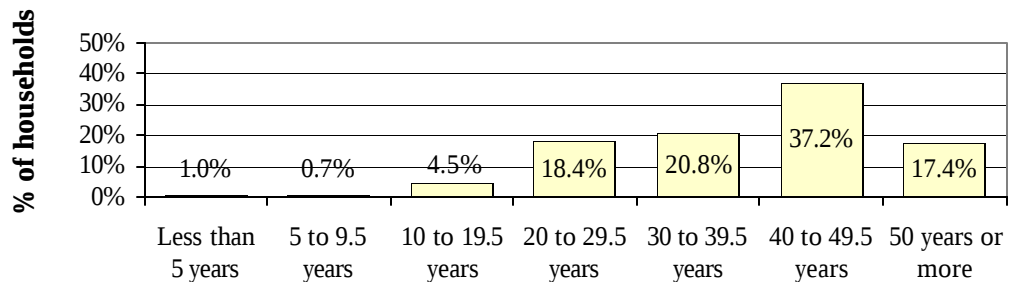
(Source: 1996 American Community Survey)

Housing Characteristics

Age of Housing

Although housing construction near the 122nd Avenue station began prior to 1946, with 17.4% of the housing built by that year, the largest share of housing structures were constructed from 1947 through 1956. And development remained relatively high over the next twenty years; 20.8% of the total housing was built in the first ten of these years, 18.4% in the following ten. Only 6.2 percent of the housing structures were built after 1976.

Figure 6-16: Age of Housing Structure



Source: 1996 American Community Survey

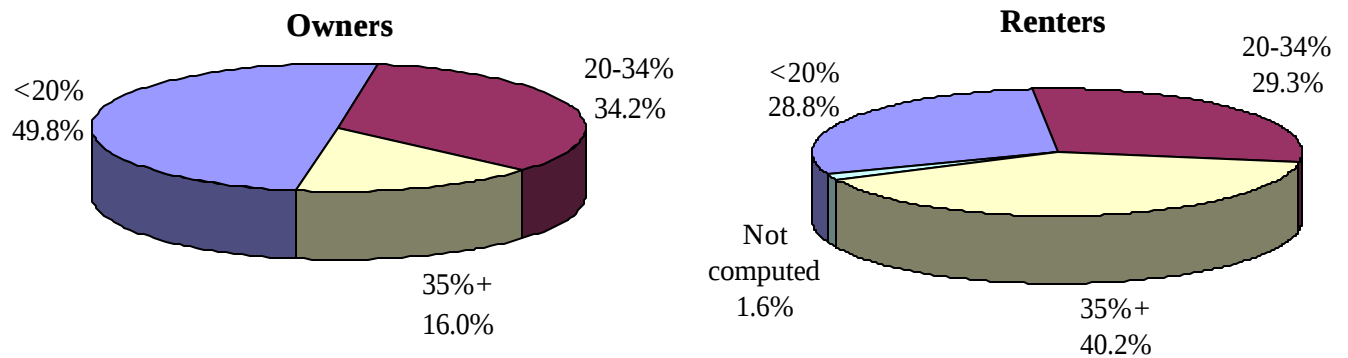
Housing Costs

In 1996, according to the American Community Survey, the median house value near the 82nd Avenue station was \$105,500. The median contract rent for residential housing was \$485 per month.

Housing Costs as a Percentage of Household Income

In 1996, approximately one-half of homeowners in the area (49.8%) spent less than 20 percent of their household income on housing. Over 34% spent 20-34 percent of their income on housing and 16% spent 35 percent or more. Over 40% of renters, on the other hand, spent 35 percent or more of their income on housing, while 29.3% spent between 20-34 percent and only 28.8% spent less than 20 percent.

Figure 6-17: Owner vs. Renter Housing Costs as a Percentage of 1996 Household Income



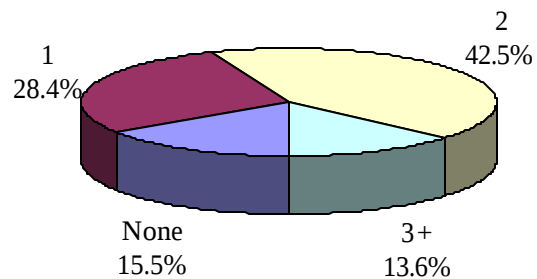
Source: 1996 American Community Survey

Employment Characteristics

Workers per Family

As of 1996, two-worker families were dominant near the 122nd Avenue station area, representing 42.5% of the total families. Families with one worker were also common, with a 28.4% share. Of the remaining families, 13.6 percent had more than two and 15.5 percent had no workers in the family.

Figure 6-18: Workers per Family



(Source: 1996 American Community Survey)

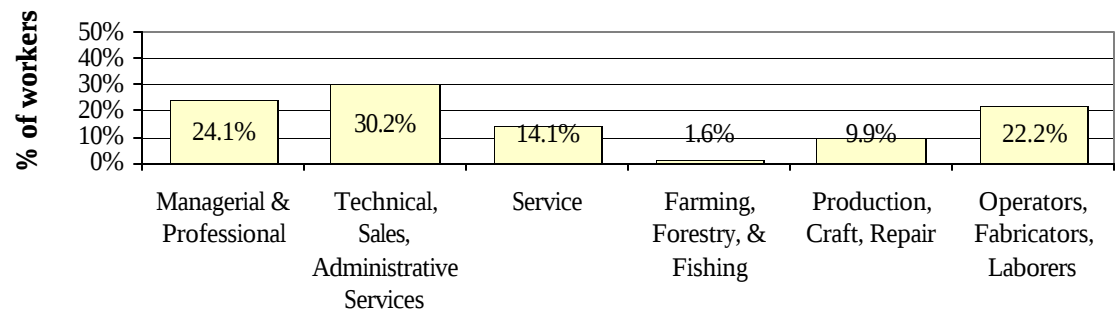
Household Income

According to American Community Survey data, the median 1996 adjusted household income near the 122nd Avenue station area was \$34,059.

Occupation of Local Workforce

In 1996, the predominant worker occupations in the 122nd Avenue station area were technical, sales and administrative (30.2%), managerial and professional occupations (24.1%), and operators, fabricators and laborers (22.2%). Farming, forestry and fishing employed only 1.6% of the area workforce. Service occupations employed 14.1 percent of the workers and production, craft or repair occupations employed 9.9 percent of the workforce.

Figure 6-19: Occupations



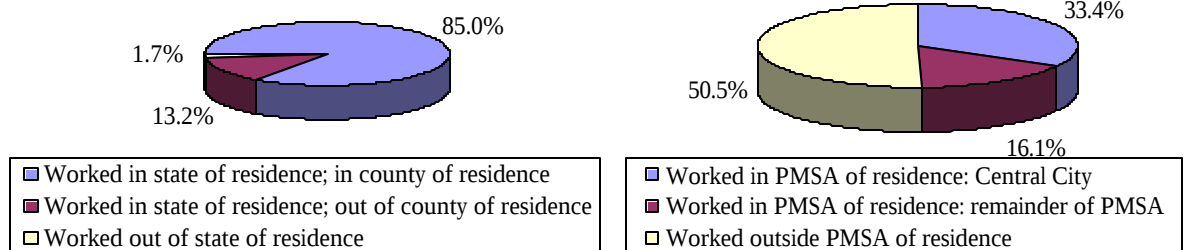
(Source: 1996 American Community Service)

Place of Work for Area Residents

Most of the local residents (85%) worked in Multnomah County, with only 33.4% of those workers employed in the City of Portland and over half working outside of the Portland metropolitan area.

Figure 6-20: Place of Work: State & County;

Place of Work: PMSA



(Source: 1996 American Community Survey)

Descriptor Values

The baseline descriptor values for the 122nd Station Area are list below.

Density

The density descriptors measure the intensity of development in an area. The density calculations use net acres in the denominator. The net acreage in the 122nd Station Area is 302 acres.

- ◆ Single Family Density = 2 dwelling unit per net acre
- ◆ Multi family density = 3 dwelling units per net acre
- ◆ Total residential density = 5 dwelling units per net acre
- ◆ Total employment density = 7 employees per net acre

Diversity

The diversity descriptors measure the mix of uses in an area.

	Number of Uses	% of Total Land Use Area within Center
Detached Residential	594	37%
Attached Residential	826	10%
Key Commercial Activities	67	17%
Schools	2	7%
Community Center/Library	1	0%
Parks	2	8%

Design

The design descriptors measure street and building characteristics.

The following descriptors relate to the street design:

- ◆ Intersection density = 7.6 intersections per mile
- ◆ Percentage of street segments with sidewalks along both sides of the street = 39%
- ◆ Percentage of designated bicycle facilities built to date = 43%

Ninety-four commercial properties were evaluated for transit/pedestrian friendliness. The criteria used to evaluate each property include:

1. Building setback is within 25 feet of the transit/pedestrian street.
 2. No vehicle parking occurs between the transit/pedestrian street and building.
 3. Main entrance to the building orientates to the transit/pedestrian street.
- ◆ Percentage of properties meeting three criteria = 24%
 - ◆ Percentage of properties meeting two criteria = 22%
 - ◆ Percentage of properties meeting one criterion = 40%
 - ◆ Percentage of properties meeting none of the criteria = 14%

Transit Service

The transit service descriptors measure the quality of transit service in the area.

Number of lines serving the area = 4

Route	Peak Hour Headway	Mid-day Headway	Service Hours
MAX	7.5 minutes	10 minutes	21.5 hours
25	60 minutes	60 minutes	13 hours
26	30 minutes	30 minutes	18.5 hours
71	15 minutes	15 minutes	16 hours

Transportation Demand Management

The transportation demand management descriptor measures the occurrence of employer TDM programs in the area.

- ◆ Number of employers subject to Eco-rule requirements = 3

Parking

The parking descriptors measure the availability and cost of area parking.

- ◆ Average cost of parking per hour = \$0.00
- ◆ Average off-street parking spaces per 1000sf of commercial use = 4.4 spaces/1000sf

Demographics

The demographic descriptors measure key socio-economic patterns in the area.

- ◆ Median income = \$34,059

◆ Household Size

Number of Persons in Household	Percentage
1 Person	31%
2 Persons	34%
3 Persons	16%
4 Persons	10%
5 Persons	5%
6 Persons	1%
7 or More Persons	3%

◆ Household Workers

Number of Workers in Household	Percentage
0 Workers	16%
1 Worker	28%
2 Workers	42%
3 or More Workers	14%

◆ Vehicle Ownership

Number of Vehicles	Percentage
No Vehicles	4%
1 Vehicle	31%
2 Vehicles	43%
3 Vehicles	17%
4 Vehicles	3%
5 or More Vehicles	2%

Travel Profile

The 122nd Station Area travel profile relies on data associated with Metro's transportation analysis zones 744, 745, 746, and 747, aggregated to a single zone approximating the station area boundary.

In 1994, an estimated 37,146 person trips had origins or destinations within the 122nd Station Area. Of these, 2% were local trips, occurring entirely within the area and 98% of trips had origins or destinations within other zones.

Table 6-2 shows the distribution of these trips by trip purposes. The majority of trips fall into the Home-based Other category. Notable is the relatively large percentage of Non-home-based Non-Work trips (23%). This indicates that station area employees are using the commercial services available in the area. However, as seen in Table 6-3, Mode Split by Purpose, these trips are most frequently occurring by vehicle.

Table 6-2: 122nd Station Community Trip Distribution by Trip Purpose

Trip Purpose	% of Total Person Trips
Home-based Work Trips	17%
Home-based Other Trips	43%
Non-home-based Work Trips	11%
Non-home-based Non-work Trips	23%
College Trips	1%
K-12 School Trips	5%

Table 6-3: 122nd Station Community Mode Split by Trip Purpose

Trip Purpose	Drive Alone	Shared Auto	Transit	Walk & Bike	School Bus
Home-based Work	76%	14%	8%	3%	0%
Home-based Other	59%	33%	3%	5%	0%
Non-home-based Work	63%	35%	1%	1%	0%
Non-home-based Non-work	63%	36%	1%	1%	0%
College	42%	24%	15%	2%	0%
K-12 School	5%	3%	2%	28%	62%

The distribution of mode splits by trip purpose is shown in Table 6-3. In all categories, Drive Alone trips capture the greatest market share. Only 12% of employees choose to take transit, walk, or bike to work. The highest transit, walk, and bike mode splits occur in the College and School categories. However, these trips represent only 7% of the total trips in the zone.

Figures 6-21 and 6-22 show the primary travel patterns between the 122nd Station Area and other transportation zones. Of the total trips for the area, 50% originate in the 122nd Station Area and 50% travel to the area. Generally, trips to and from the station area are concentrated in the zones east of the Willamette River. The station draws trips from a wide area including east Clackamas County and Clark County in Washington. This can be explained in part by the presence of a large park and ride lot adjacent to the MAX station.

Figure 6-21: Geographic Distribution of Trips Originating in 122nd Station Area

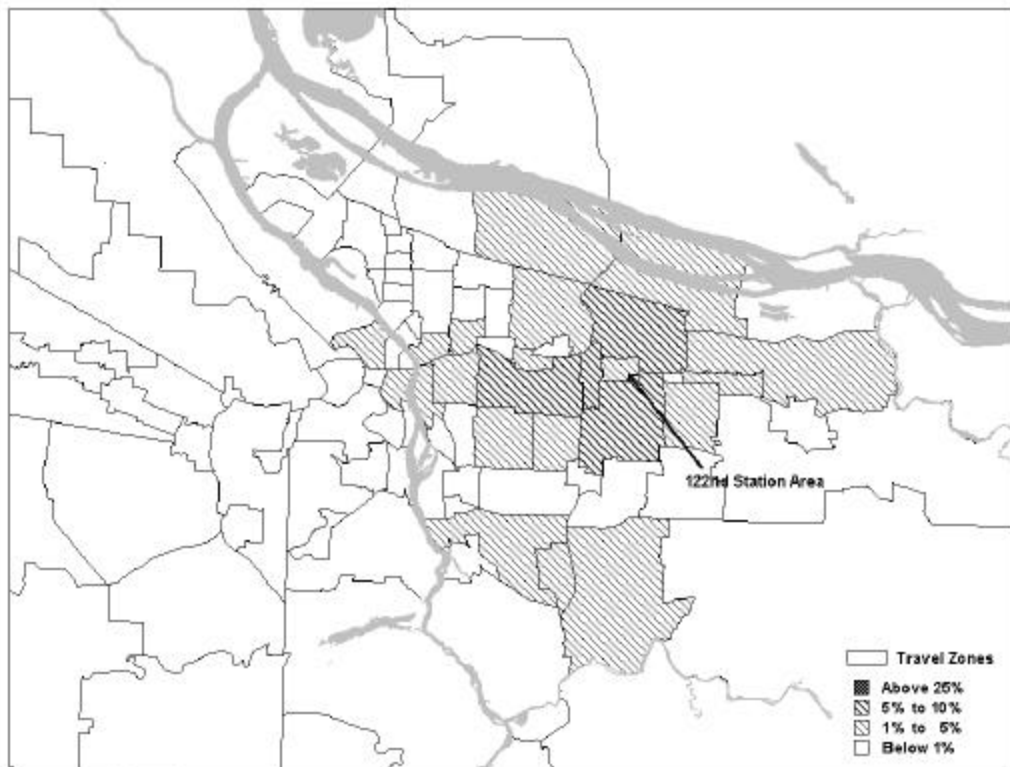
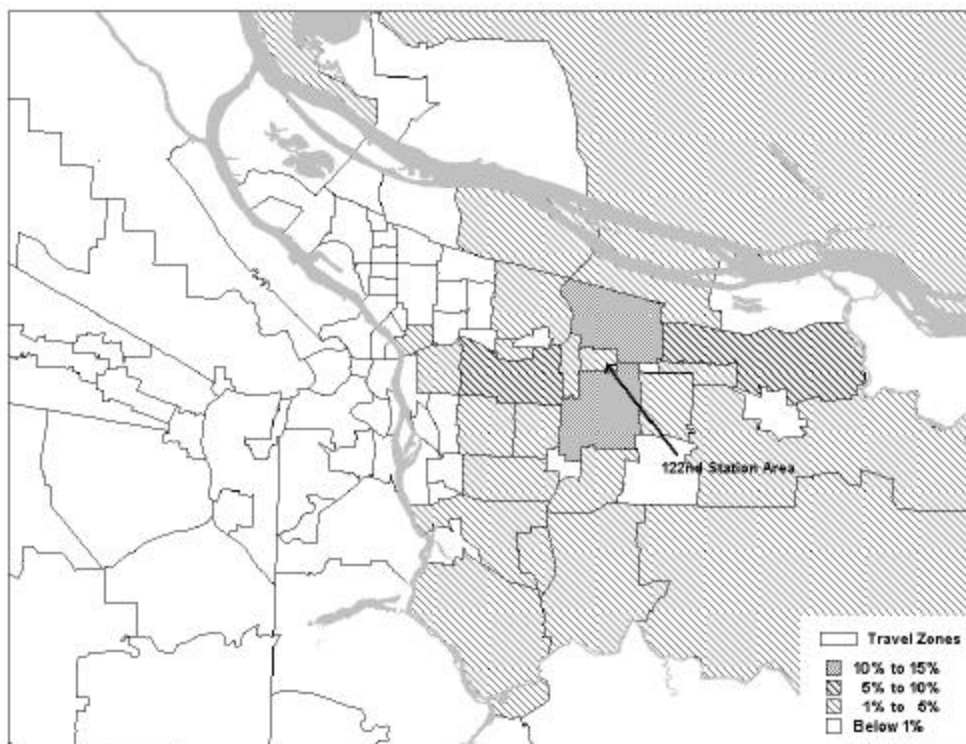


Figure 6-22: Geographic Distribution of Trips Coming To 122nd Station Area



Case Study 7

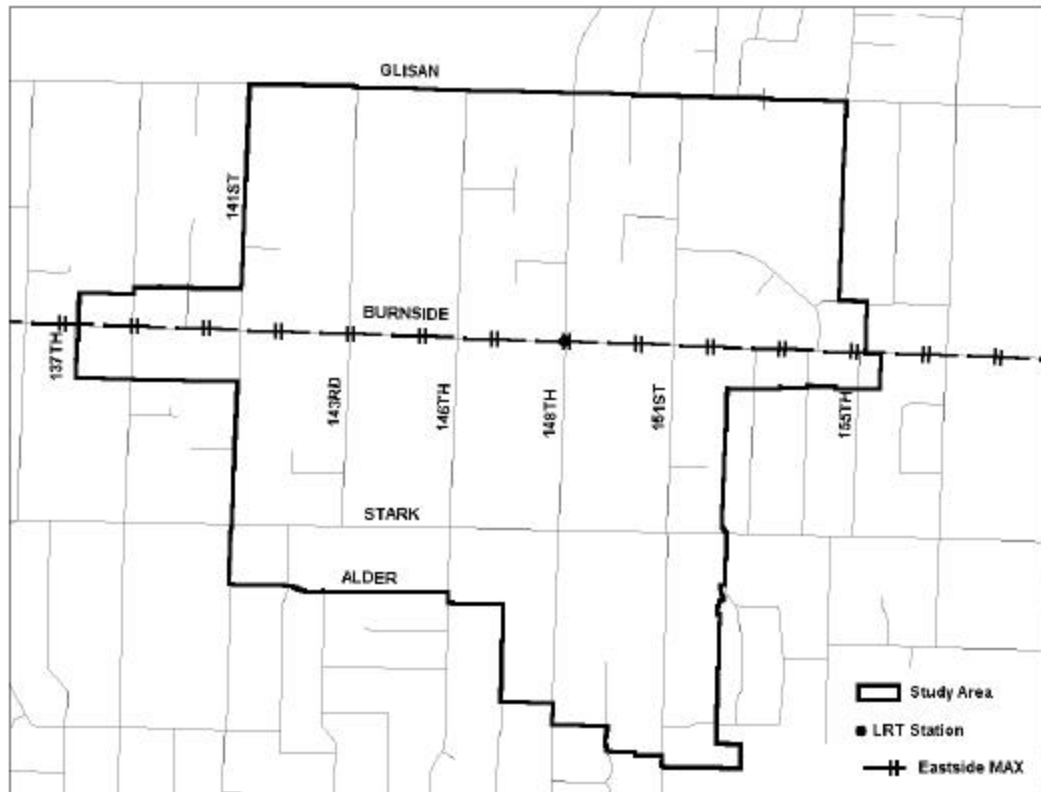
148th Station Community

Study Area Profile

Location

The 148th Station Area is centered on the Eastside MAX station at 148th Avenue and East Burnside. It is bounded roughly by NE Glisan to the north, SE Taylor to the south, 153rd to the east, and 139th to the west. The study area lies within portions of the Centennial, Glenfair, and Hazelwood neighborhoods. The study area is approximately 278 acres.

Figure 7-1: 148th Station Area Vicinity Map

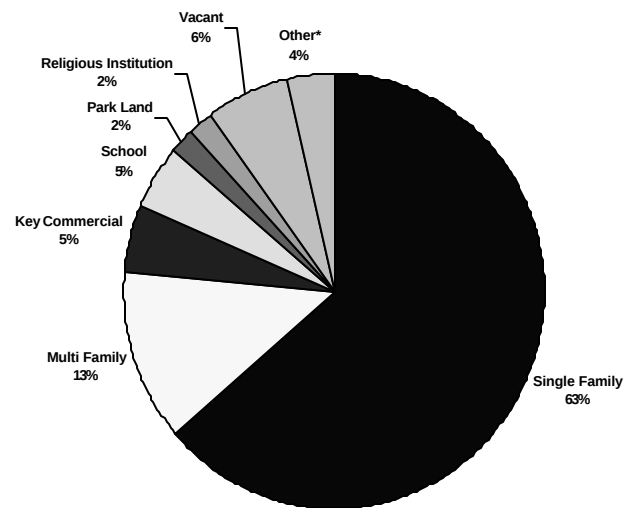


Land Use

Current Land Use Pattern

Figure 7-2 shows the distribution of existing land uses in the 148th Station Area. The area is primarily low-density, single-family residential. The average lot size for a single-family residence is almost 1/3 of an acre. The total number of single family units in the area is 456. The multi family uses are interspersed along NE/SE148th, E. Burnside, and SE Stark. The total number of multi family units is 598.

Figure 7-2: 148th Land Use Distribution



* Other category includes Vehicle Services, Industrial uses, Commercial and Retail uses not identified as key commercial, and Institutional Uses excluding schools, civic uses, and religious uses.

The core of commercial, retail, and industrial activity occurs in the southern half of the station area, in a corridor running along SE Stark from the intersection of 148th and SE Stark westward. Only 5% of the land area is in a key commercial activity. Table 7-1 shows the distribution of key commercial activities.

There are approximately 22 commercial structures in the area. The majority of these structures were designed for easy automobile access. Only a handful of commercial structures can be considered transit- and pedestrian-friendly in their design.

The station area has a relatively small employment base. Employment data from 1996 show that approximately 430 people work in the area. There are no area employers subject to ECO-rule requirements.

Table 7-1: Distribution of Key Commercial Activities in 148th Station Area

Key Commercial Categories	Number of Establishments
Grocery	3
Drug Store	0
Restaurant	2
Personal Services	2
Retail Goods	7
Professional Services	2

Zoning

Figure 7-3 shows the current zoning pattern for the area. The 148th Station area is included in the Outer Southeast Community Plan boundary. The plan, adopted in 1996, updated the zoning around this station area to encourage higher density residential and neighborhood-serving commercial uses over time.

The current land use pattern is largely residential and the rezoning maintains this character albeit at a higher density. The highest residential zoning in the area, RH, is adjacent to the station. Neighborhood-serving commercial zoning is located primarily along SE Stark. E Burnside has a limited amount of mixed-use commercial zoning.

Parks and Open Space

Glenfair Park lies within the 148th Station Area. The park is located between NE Glisan and E Burnside, east of NE 148th. It is approximately 5 acres. Just outside the study area is Glendover golf course on NE Glisan and the Park Rose Little League field on E Burnside.

Community and Municipal Facilities

The 148th Station Area has just one civic facility, the Glenfair Elementary School.

Circulation

The principal streets within the 148th Station Area are NE Glisan, E Burnside, and SE Stark, running east-west, and NE/SE 148th, a north-south street. These streets form the basic framework for the street grid in this area.

Large blocks characterize the study area. The average length between street connections is 813 feet. There are many stub streets providing no through connection.

Traffic

Figure 7-4 shows the street classifications for traffic streets within the 148th Station Area. NE Glisan and SE Stark, both Major City Traffic Streets, funnel traffic to, from, and through the area. E Burnside serves as a neighborhood collector, providing more localized circulation between the surrounding neighborhoods. NE/SE 148th, a District Collector, is the primary north-south connection for the station area and surrounding neighborhoods.

Figure 7-3: 148th Zoning

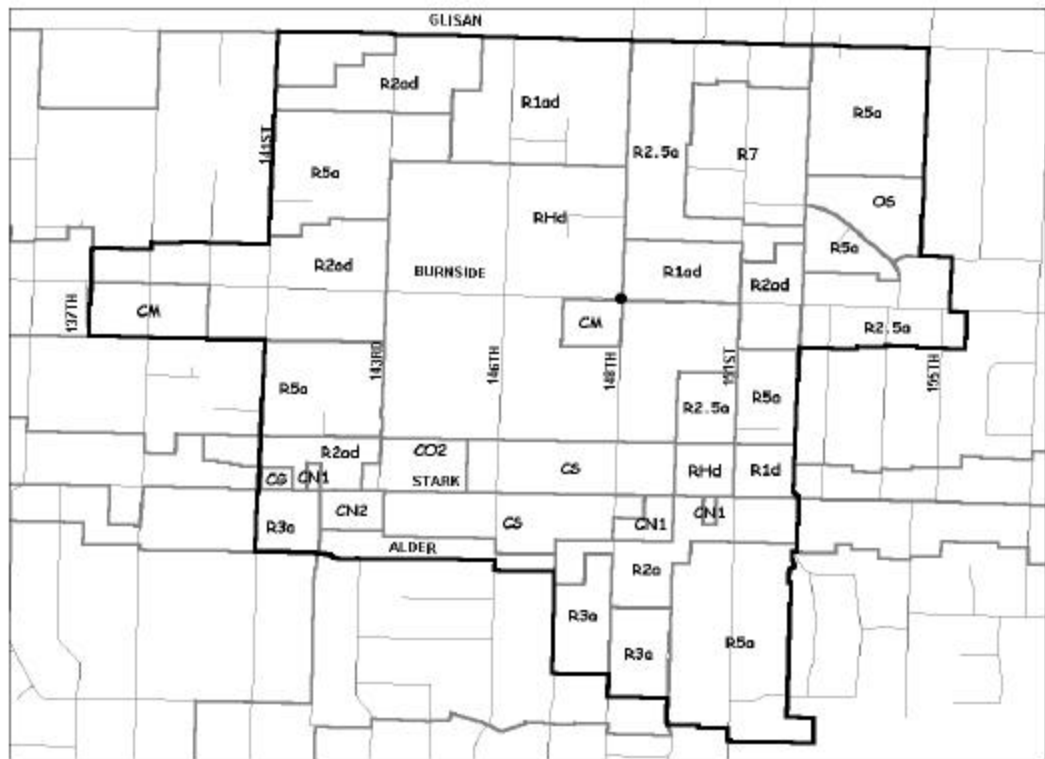


Figure 7-4: Traffic Street Classifications for 148th Station Area

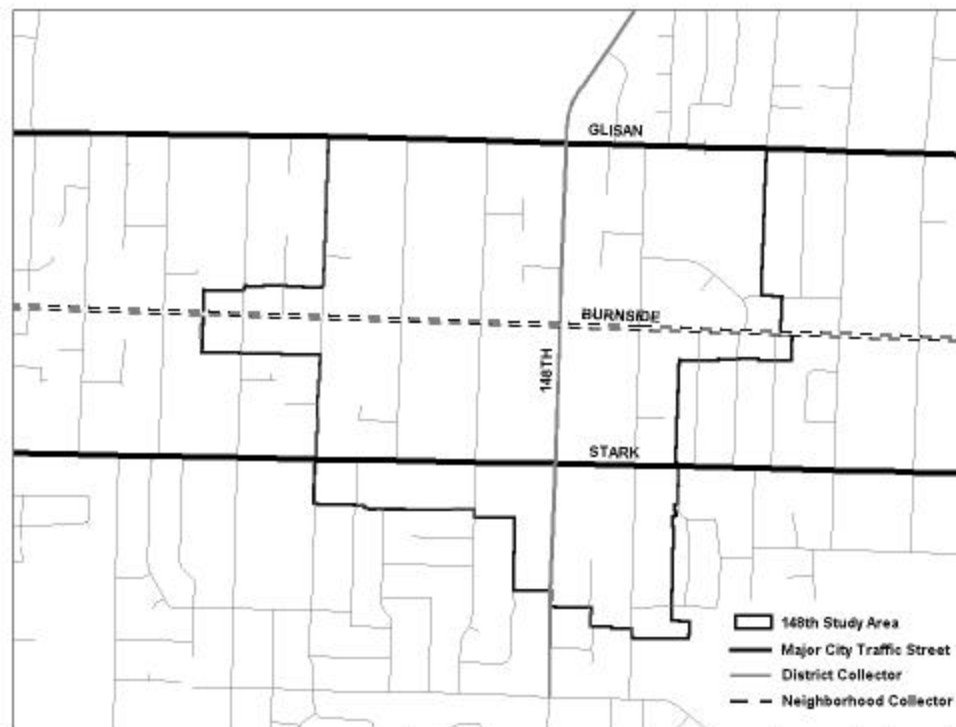
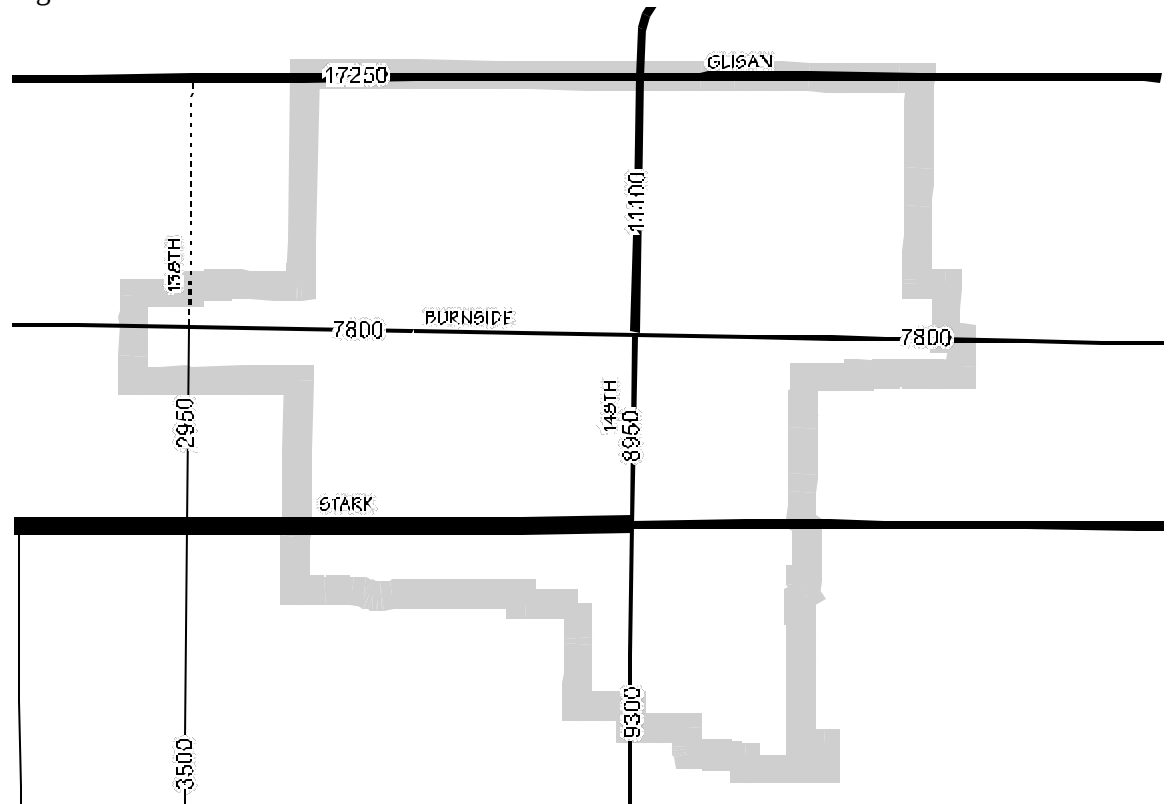


Figure 7-5 shows the traffic flow volumes for 148th Station Area. Both NE Glisan and SE Stark carry significant volumes of traffic through the area.

Figure 7-5: 148th Station Area Traffic Flows

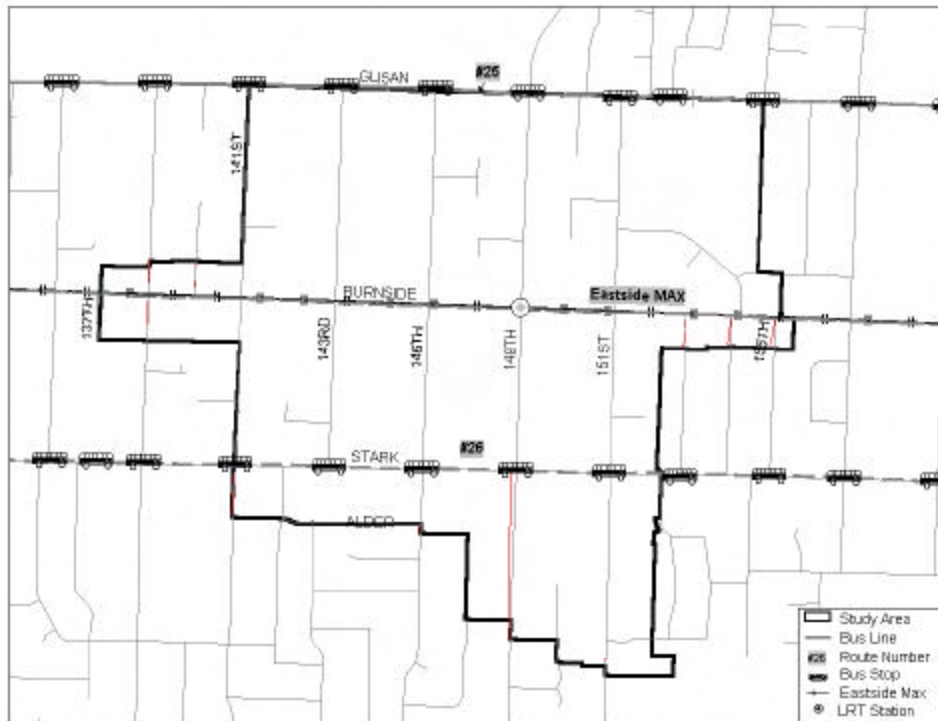


Transit Service

Figure 7-6 provides a map of the transit network serving the 148th Station Area. The 148th Station Area is centered on the Eastside MAX Light Rail Station at 148th and East Burnside. Eastside Max provides regional service from downtown Gresham to downtown Portland and continued service along the Westside MAX alignment to Beaverton and Hillsboro. Service to downtown Portland begins at approximately 4:10 am and continues until 1:40 am. MAX trains run at a high frequency throughout the day. Trains average seven and one half-minute headways in the peak hour and ten-minute headways in non-peak hours.

In addition to Light Rail Service, 148th is serviced by two Tri-Met bus routes: #25 and #26. Both routes are designed to provide local connecting service to the Eastside MAX Light Rail. Route #25 originates at the Rockwood Transit Center at 188th, runs parallel to the MAX Alignment along NE Glisan, and terminates at the Gateway Transit Center. Designed as supplemental service, Route 25 provides only hourly headways between 6am and 7:30pm.

Figure 7-6: 148th Station Area Transit Service

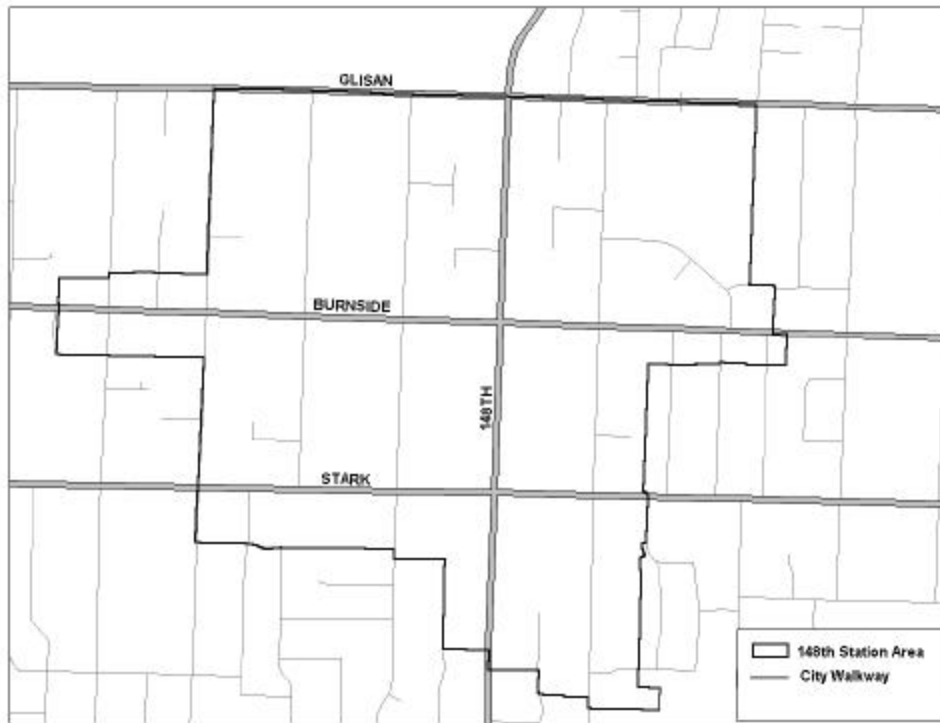


Route #26 originates at the Gresham transit center, provides connecting service to Mt. Hood Community College, and runs parallel to MAX along Stark before terminating at the Gateway Transit Center. It provides service to the 148th station area at 30-minute headways between 5:15am and 11:45pm.

Pedestrians

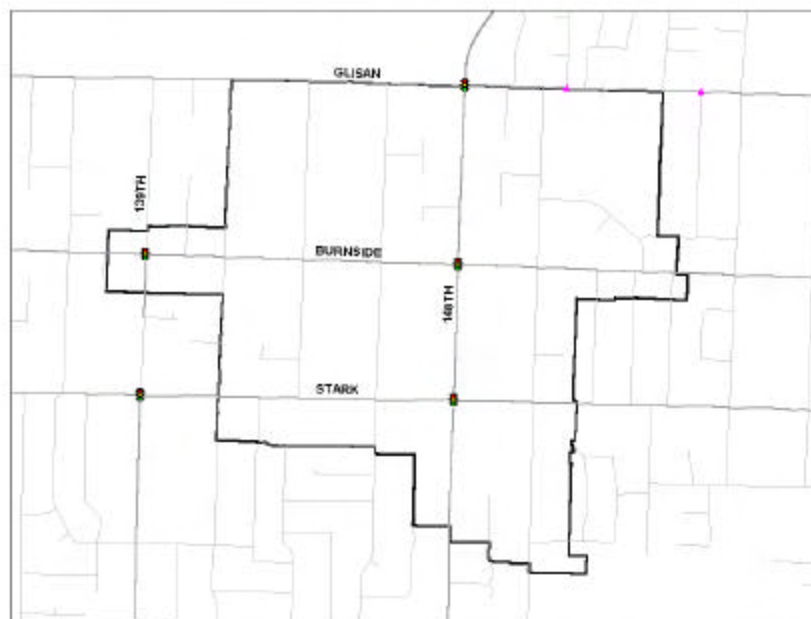
A survey of the existing sidewalks in this station area reveals a deficiency in pedestrian facilities. Figure 7-7 shows the street classifications for the pedestrian network. The primary pedestrian streets in the area are NE Glisan, E Burnside, SE Stark, and NE/SE 148, which are classified as City Walkways. Of these streets, E Burnside has curbs and sidewalks along its length through the station area. NE Glisan has curbs along most of its length but sidewalks are not continuous. SE Stark, west of 148th has curbs and sidewalks. East of 148th on SE Stark there are gaps in the sidewalk network. NE/SE 148th has continuous curbs and sidewalks. The local streets, with few exceptions, are not improved with curbs and/or sidewalks.

Figure 7-7: 148th Station Area Pedestrian Street Classifications



Traffic signals that facilitate pedestrian crossing are located at the intersections of NE Glisan-NE 148th, E Burnside-NE/SE 148th, SE Stark-SE 148th, and E Burnside-NE/SE 139th. Along E Burnside, pedestrian crossings of the MAX tracks are provided at most local street intersections.

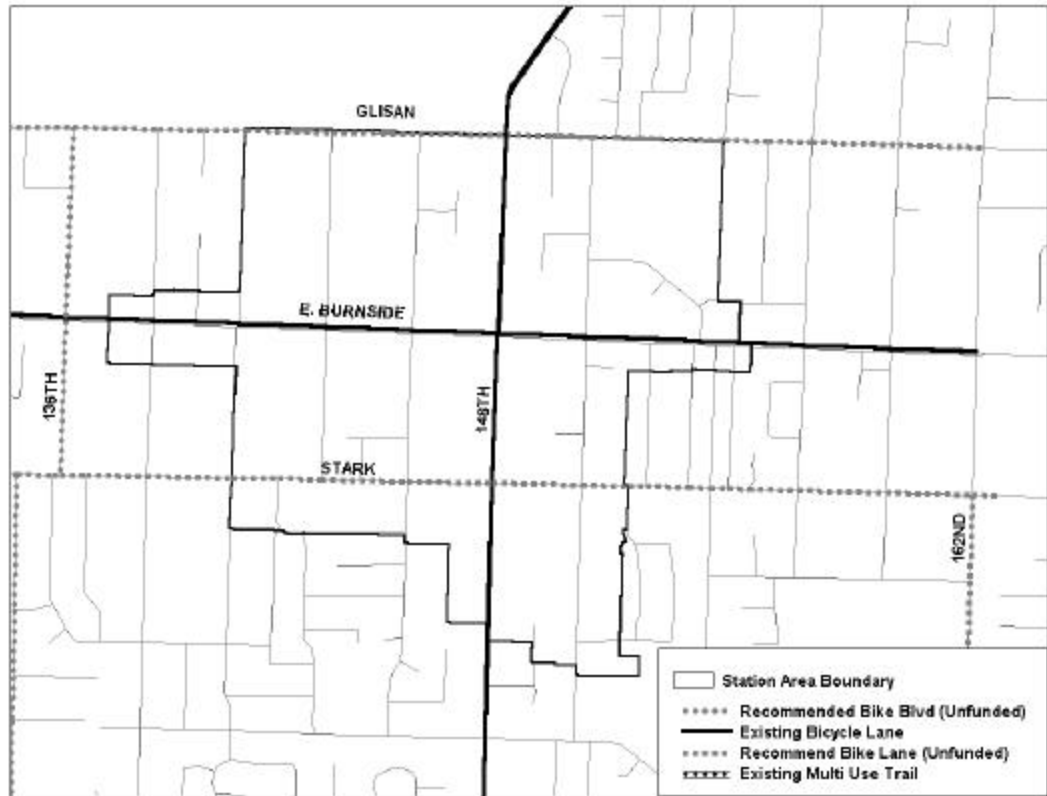
Figure 7-8: 148th Station Area Traffic Signals



Bicycles

Figure 7-9 shows the bicycle network for this station area. NE Glisan, E Burnside, SE Stark, and NE/SE 148th are all classified as City Bikeways. Bike lanes have been striped on E Burnside and NE/SE 148th. NE Glisan and SE Stark are designated for bike lanes but funding has not been allocated.

Figure 7-9: 148th Bicycle Network



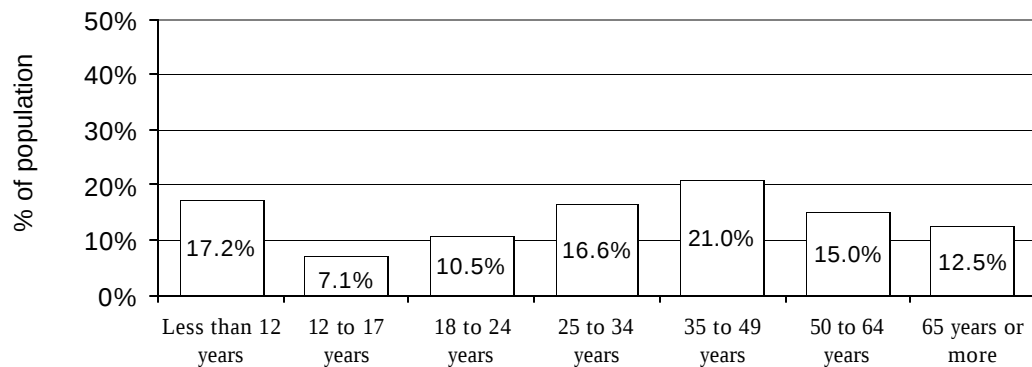
Population and Household Characteristics⁸

Age Distribution

As of 1996, no single age group predominates in the population of the 148th Avenue station area. The highest share (21%) are residents age 35 to 49 years, but this is only slightly higher than the shares of children under 12 (17.2%), residents age 25 to 34 (16.6%), and age 50 to 64 (15%). Seniors (65 or older) represent 12.5% of the population; young adults (18 to 24), 10.5%; and adolescents (12 to 17), 7.1%.

⁸ Since data is reported on the basis of block groups, the following medians and percentages are based on block group medians and totals.

Figure 7-10: Age Distribution in 148th Station Area

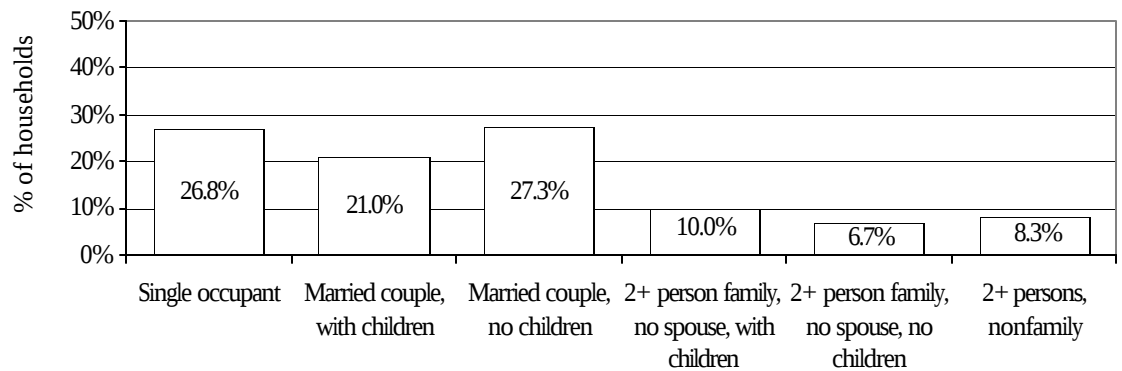


(Source: 1996 American Community Survey)

Household Size and Type

The most common household types near the 148th Avenue station are married couples without children (27.3% of the households), single occupants (26.8%), and married couples with children (21%). The remaining household types represent only 10% (family households of 2 or more with no spouse present, with children), 8.3% (non-family households with two or more persons), and 6.7% (family households of 2 or more with no spouse or children present).

Figure 7-11: Distribution of Household Type

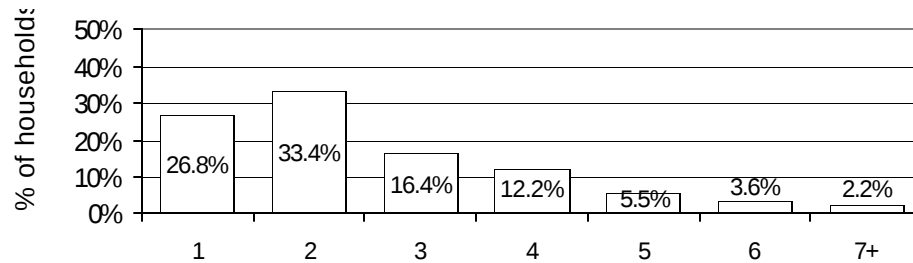


(Source: 1996 American Community Survey)

Persons per Household

As of 1996, the majority of households in the area are made up of only 1 or 2 persons (33.4% and 26.8% respectively, with a combined share of 60.2%). The next highest shares are 3 and 4 person households, with 16.4% and 12.2% of the total households, respectively. Five-person households represent 5.5%, 3.6% had 6 persons, and only 2.2% have 7 or more.

Figure 7-12: Number of Persons per Household

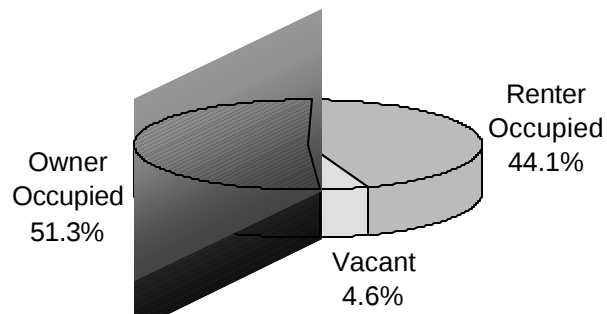


(Source: 1996 American Community Survey)

Tenure and Occupancy Status

There is not a great difference between the shares of owner- and renter-occupied housing near the 148th Avenue station. Owner occupied housing makes up just over half (51.3%) of the total housing, renters occupied 44.1%, and 4.6% are vacant.

Figure 7-13: Occupancy Status

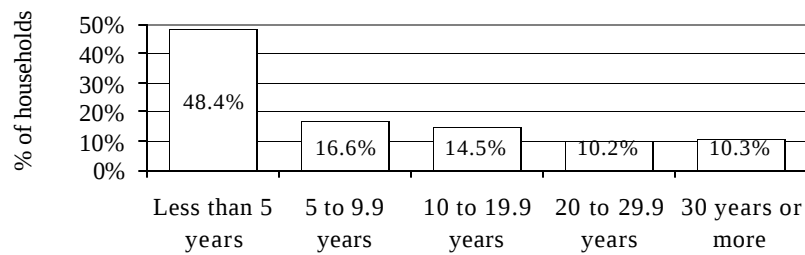


(Source: 1996 American Community Survey)

Length of Residence

As of 1996, nearly one half of the households (48.4%) had moved to the area within the last 5 years. The other 52.6% are distributed fairly evenly among the longer residency lengths; 16.6% have lived in the area 5 to 9.9 years as of 1996, 14.5% for 10 to 19.9 years, 10.2% for 20 to 29.9 years, and 10.3% for 30 years or more.

Figure 7-14: Length of Residence

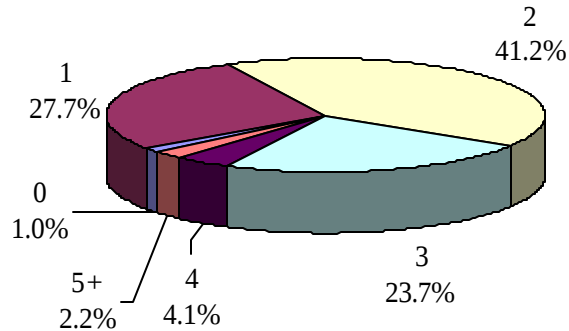


(Source: 1996 American Community Survey)

Vehicle Availability

As of 1996, over 40 percent of households near the 148th Avenue station have 2 vehicles available for use. Of the remaining households, the majority has either one or three vehicles (27.7% and 23.7% respectively). Over 6 percent have 4 or more vehicles available and only one percent of the households has none available.

Figure 7-15: Vehicles per Household



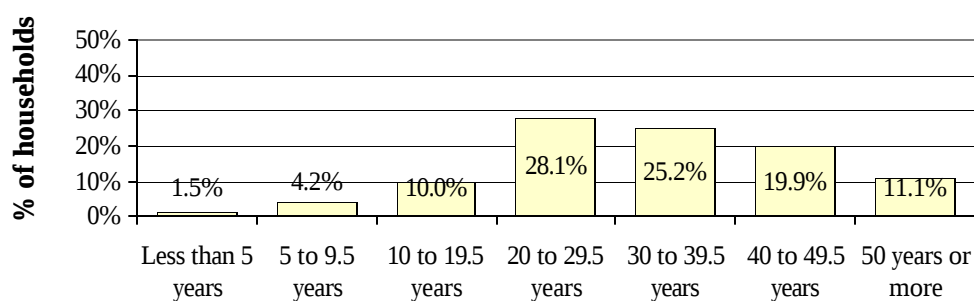
(Source: 1996 American Community Survey)

Housing Characteristics

Age of Housing

Nearly all of the housing structures near the 148th Avenue station (84.3%) were constructed prior to 1977, with over half of this development (53.3%) taking place between 1957 and 1976. Development was slowest at the two extremes of the time period; only 11.1 percent of the housing was built prior to 1947 and only 5.7 percent since 1986.

Figure 7-16: Age of Housing Structure



(Source: 1996 American Community Survey)

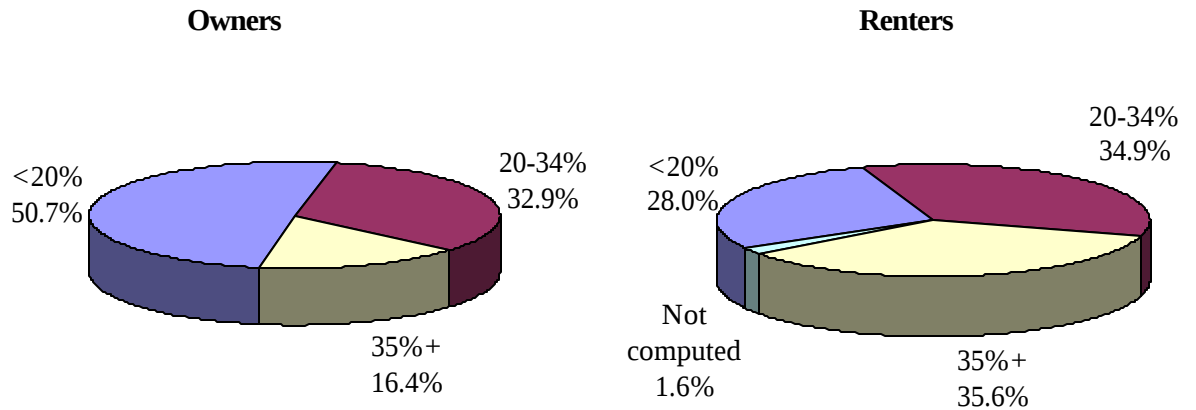
Housing costs

In 1996, according to the American Community Survey, the median house value in the 148th Avenue station area was \$112,900. The median contract rent for residential housing was \$504 per month.

Housing costs as a percentage of household income

Based on 1996 data, over one half of the homeowners in the area (50.7%) spend less than 20 percent of their household income on housing. Nearly 33% spent 20-34 percent of their income on housing and 16.4% spent 35 percent of their income or more. Only 28% of renters, on the other hand, spend less than 20 percent of their income on housing, while 34.9% spend 20-34 percent and 35.6% spend 35 percent or more.

Figure 7-17: Owner vs. Renter Housing Costs as a Percentage of 1996 Household Income

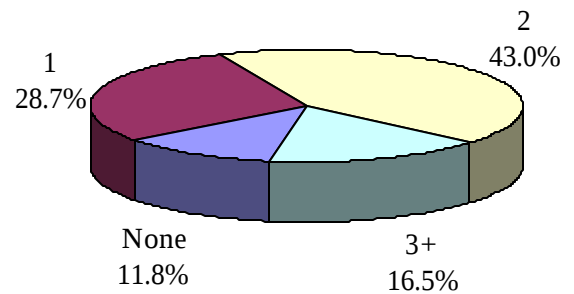


Employment Characteristics

Workers per Family

As of 1996, the largest proportion of families in the area (43%) has 2 workers per family; the second highest share (28.7%) has only one worker. Nearly 12 percent of the families have no worker in the family and 16.5 percent have three or more workers.

Figure 7-18: Workers per family



(Source: 1996 American Community Survey)

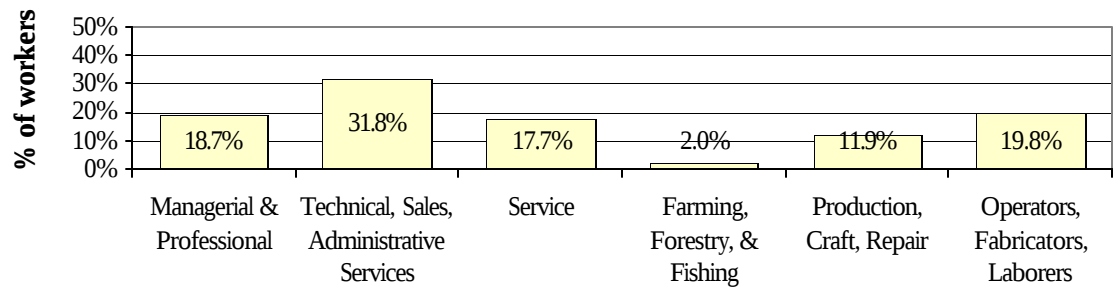
Household Income

According to American Community Survey 1996 data, the median adjusted household income in the 148th Avenue station area is \$33,942.

Local Workforce Occupations

Based on 1996 data, the technical, sales and administrative occupations have the highest share of the local workforce (31.8%). The next highest shares are those working as operators, fabricators or laborers (19.8%), in managerial and professional occupations (18.7%), and in service occupations (17.7%). Nearly 12 percent of the workforce work in production craft or repair and only 2 percent are employed in farming, forestry and fishing.

Figure 7-19: Occupations



(Source: 1996 American Community Service)

Place of Work for Area Residents

Most of the local residents (73.6%) work in Multnomah County, with nearly all of these employed in the City of Portland (71.1). Only 3.5% of workers commute outside the Portland metropolitan region.

Figure 7-20: Place of Work: State & County

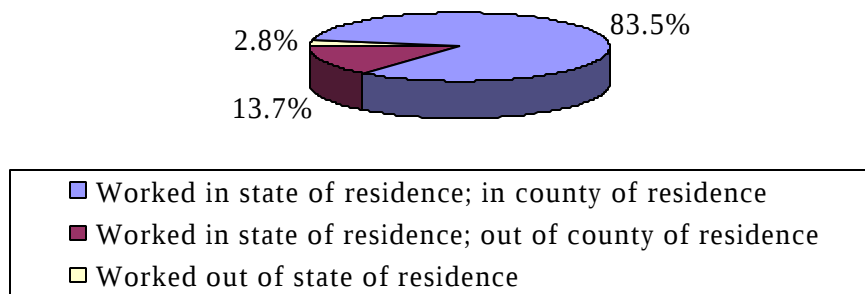
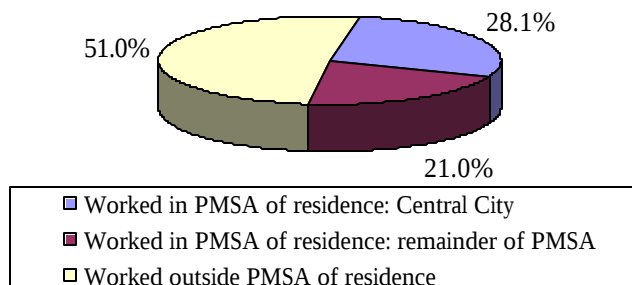


Figure 7-21: Place of Work: PMSA



Descriptor Values

The baseline descriptor values for the 148th Station Area are listed below.

Density

The density descriptors measure the intensity of development in an area. The calculation of density is based on net acreage. The net acreage in 148th is 232 acres.

- ◆ Single family density = 2 dwelling units per net acre
- ◆ Multi family density = 3 dwelling units per net acre
- ◆ Total residential density = 5 dwelling units per net acre
- ◆ Total employment density = 2 employees per net acre

Diversity

The diversity descriptors measure the mix of uses in an area.

	Number of Uses	% of Total Land Use Area within Center
Detached Residential	456	63%
Attached Residential	598	13%
Key Commercial Activities	16	5%
Schools	1	5%
Community Center/Library	0	0%
Parks	1	2%

Design

The design descriptors measure street and building characteristics.

The following descriptors relate to the street pattern and design:

- ◆ Intersection density = 6.5 intersection per mile
- ◆ Percentage of street segments with sidewalks along both sides of the street = 20%
- ◆ Percentage of designated bicycle facilities built to date = 63%

Twenty-two commercial properties were evaluated for transit/pedestrian friendliness. The criteria used to evaluate each property include:

1. Building setback within 25 feet of the transit/pedestrian street.
2. No vehicle parking between the transit/pedestrian street and building.
3. Main entrance to the building oriented to the transit/pedestrian street.

- ◆ Percentage of properties meeting three criteria = 18%
- ◆ Percentage of properties meeting two criteria = 5%
- ◆ Percentage of properties meeting one criterion = 36%
- ◆ Percentage of properties meeting none of the criteria = 41%

Transit Service

The transit service descriptors measure the quality of transit service in the area.

- ◆ Number of lines serving the area = 3

Route	Peak Hour Headway	Mid-day Headway	Service Hours
MAX	7.5 min	10 min	21.5 hours
#25	60 min	60 min	13 hours
#26	30 min	60 min	18.5 hours

Transportation Demand Management

The transportation demand management descriptor measures the occurrence of employer TDM programs in the area.

- ◆ Number of employers subject to Eco-rule requirements = 0

Parking

The parking descriptors measure the availability and cost of area parking.

- ◆ Average cost of parking per hour = \$0.00
- ◆ Average off-street parking spaces per 1000sf of commercial use = 3.5 spaces/1000sf

Demographics

The demographic descriptors measure key socio-economic patterns in the area.

- ◆ Median income = \$33,942

◆ Household Size

Number of Persons in Household	Percentage
1 Person	27%
2 Persons	33%
3 Persons	16%
4 Persons	12%
5 Persons	6%
6 Persons	4%
7 or More Persons	2%

◆ Household Workers

Number of Workers in Household	Percentage
0 Workers	11%
1 Worker	29%
2 Workers	43%
3 or More Workers	17%

◆ Vehicle Ownership

Number of Vehicles	Percentage
No Vehicles	1%
1 Vehicle	28%
2 Vehicles	41%
3 Vehicles	24%
4 Vehicles	4%
5 or More Vehicles	2%

Travel Profile

The 148th station area travel profile uses data from Metro's transportation analysis zone 760. The zone roughly approximates the 148th study area boundary.

In 1994, an estimated total of 3,781 person trips had origins or destinations within the 148th Station Area. Table 7-2 displays the distribution of trips by purpose. The majority of trips fall into the Home-Based Other category. Work trips also contribute significantly to the overall travel behavior in the area.

Table 7-2: 148th Station Area Trip Distribution by Trip Purpose

Trip Purpose	% of Total Person Trips
Home-based Work Trips	22%
Home-based Other Trips	55%
Non-home-based Work Trips	2%
Non-home-based Non-work Trips	8%
College Trips	2%
K-12 School Trips	11%

The distribution of mode splits for each purpose is found in Table 7-3. In all categories, the single-occupancy auto was the primary mode choice. Employees commuting from this area primarily drive alone to work. Shared auto trips captured a fairly large percentage of mode split, with the exception of home-based work trips. College students and employees were most likely to use transit. However, the overall transit mode split is low. Walk and bicycle mode split is low for all purposes.

Table 7-3: 148th Station Area Mode Split by Trip Purpose

Trip Purpose	Drive Alone	Shared Auto	Transit	Walk & Bike	School Bus
Home-based Work	77%	13%	7%	3%	0%
Home-based Other	60%	34%	2%	4%	0%
Non-home-based Work	64%	35%	1%	0%	0%
Non-home-based Non-work	64%	35%	1%	0%	0%
College	55%	30%	12%	3%	0%
K-12 School	5%	3%	2%	28%	62%

Less than 1% of all the trips assigned to the station area are local trips. The overwhelming majority of trips have origins or destinations outside of the 148th station area. The limited commercial and employment opportunities in the area help explain this behavior.

Figures 7-22 and 7-23 show the primary travel patterns between the station area and other transportation zones. Of the total person trips, 69% originate in 148th and 31% are traveling to 148th.

An analysis of travel behavior indicates that over 10% of the trips originating in 148th Station Area are destined for the employment area to the northeast, which is not served by light rail. The majority of trip destinations (41%) are within five miles of the station area.

Of trips coming to the station area, the greatest percentage (16%) come from the transportation zones directly south. Again, the majority of trips to the site originate within 5 miles of the station area.

Figure 7-22: Geographic Distribution of Trips Originating in 148th Station Area

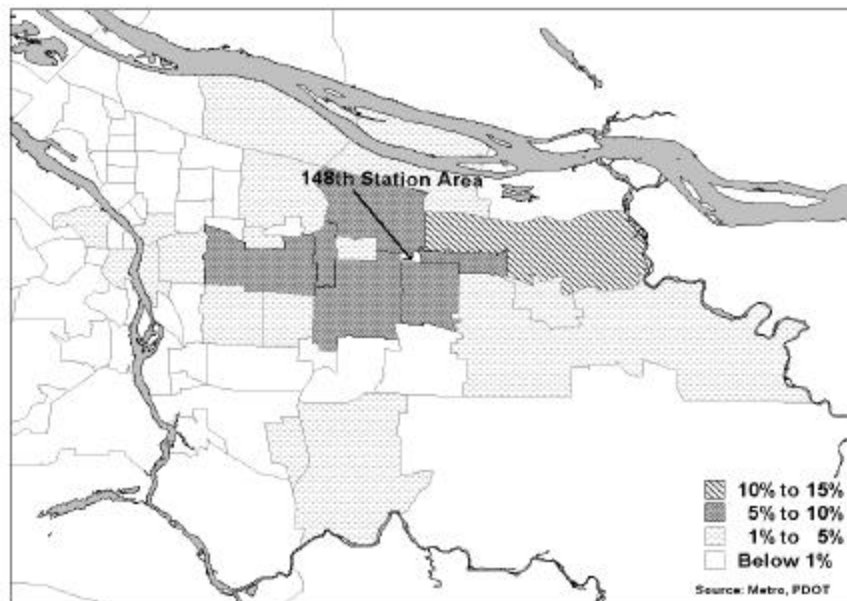
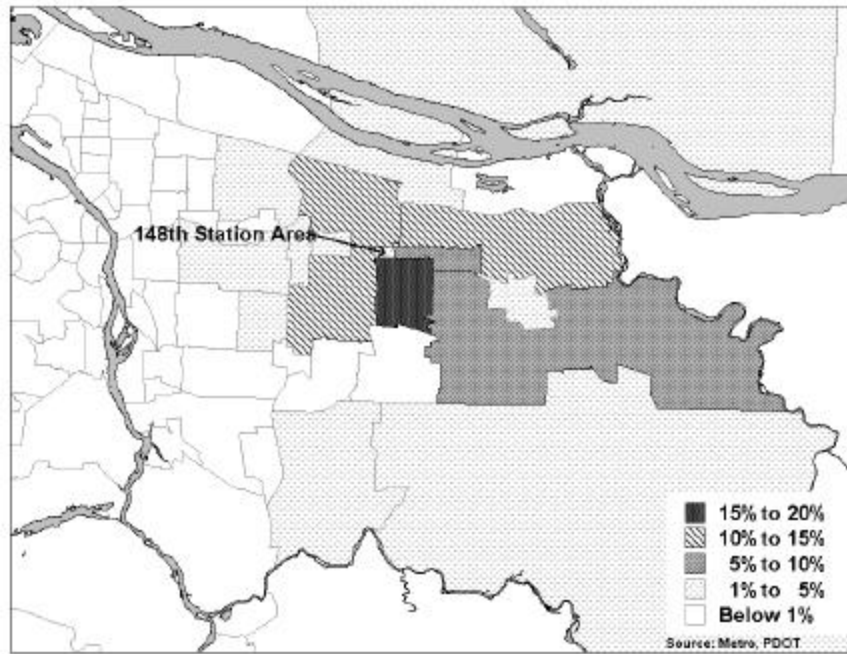


Figure 7-23: Geographic Distribution of Trips to 148th Station Area



The overall non-single occupancy mode split for the area in 1994 was estimated at 43%. The projected non-single occupancy mode split for 2020 is 50%.