performed for this project at this time, other data from similar areas and previous measurements in the general Eugen Springfield area can be used to discuss noise levels along the proposed corridors. This information can also be used to provide a qualitative look at future noise levels in the same corridors.

Noise is generally defined as unwanted sound. Noise is measured in terms of sound pressure level. It is expressed in decibels (dB), which are defined as 10 log P2/P2ref, where P is the root-mean-square (rms) sound pressure and Pref is the reference rms sound pressure of 2 x 10-5 Newtons per square meter.

The number of fluctuation cycles or pressure waves per second of a particular sound is the frequency of the sound. The human ear is less sensitive to higher and lower frequencies than to mid-range frequencies. Therefore, sound level meters used to measure environmental noise generally incorporate a weighing system that filters out higher and lower frequencies in a manner similar to the human ear. This system produces noise measurements that approximate the normal human perception of noise. Measurements made with this weighing system are termed "A-weighted" and are specified as "dBA" readings.

Several noise descriptors are used that take into account the variability of noise over time. The minimum noise level during a measurement period is denoted Lmin. The maximum noise levels (Lmax) that occur during an event, such as the passing of a heavy truck or the flyover of an airplane, can be useful indicators of interference with speech or sleep. The equivalent sound level (Leq) is the level of a constant sound for a specified period of time that has the same sound energy as an actual fluctuating noise over the same period of time, and is an energy average sound level. The day-night sound level (Ldn) is the equivalent sound level for a 24-hour period with an additional 10 dBA added to nighttime sound levels occurring between 10 p.m. and 7 a.m.

In summary, the noise level descriptors are defined as follows:

Symbol	**Description**
Lmin	The minimum noise level
Lmax	The maximum noise level
Leq	The average noise level (energy basis)
Ldn	The 24-hour average noise level with a 10-dBA penalty added to nighttime (10 p.m. to 7 a.m.) levels

Noise levels decrease with distance from a noise source. For each doubling of the distance from a point source (such as an engine), noise levels decrease by 6 dBA because of the geometric divergence of the sound waves. Excess noise reduction (attenuation) can be provided by vegetation, terrain, and atmospheric effects that block or absorb noise. The Leq noise level from a line source (such as a road) will decrease by 3 dB for each doubling of distance (3 dB/DD) because of geometric divergence alone. However, the Lmax from individual vehicles on the road will decrease by 6 dB/DD. Therefore, the maximum noise levels (Lmax) decrease more rapidly with distance from the road than do the average noise levels (Leq).

Subjectively, a 10-dB change in noise level is judged by most people to be approximately a twofold change in loudness (e.g., an increase from 50 dB to 60 dB causes the loudness to double). A 3-dB increase is a barely perceptible increase, and a 5 dB change is clearly noticeable to most people.

4.11.1.1 Traffic Data for Noise Analysis

Because the main source of noise along the proposed corridors is traffic, comparing traffic counts can be used to compare potential changes in noise levels. Traffic on public roads produces noise based on the type of vehicle (passenger vehicles and light trucks, medium trucks and buses, and heavy trucks), speed of the vehicles, traffic control devices (stop signs and signals), and roadway conditions, including roadway grade and pavement condition. For example, while the noise from passenger vehicles occurs mainly from the tire-roadway interface, and is therefore located at ground level, noise from heavy trucks is produced by a combination of noise from tires, engine, and exhaust, resulting in a nominal noise source that is approximately 8 feet above the ground. Furthermore, the typical pass-by noise level for a passenger vehicle traveling at 55 mph at 50 feet from the roadway is 74 dBA, while a heavy truck under the same conditions produces 84 dBA (FHWA 1995). In addition, vehicles accelerating from stops, or on uphill grades, can produce more noise due to increased engine loading. Based on vehicle measurements and studies of highway noise, several general rules of traffic noise have been derived by the FHWA and other transportation agencies, including:

1. Noise from constant flowing traffic on a busy highway reduces at a rate of approximately 3 dB each time the distance doubles;
2. In order to increase noise by approximately 3 dB, it takes twice as much traffic (doubling of traffic volumes), assuming the same mixture of vehicle types and speeds;
3. The relation of speed to traffic noise is approximately 3 dB for each 10 mph for vehicles traveling over 25 to 30 mph. Therefore, an increase of 10 mph would increase noise by 3 dB, and a reduction of 10 mph would reduce noise by 3 dB.

Using the general rules on traffic noise provided above along with traffic volumes, it is possible to estimate the change (increase or decrease) in noise levels that could result from a specific action or project, if we know how that action or project may affect traffic in that area.

To assist in facilitating this analysis, the average daily traffic volumes for several roadways in the proposed corridors were obtained from the U.S. TrafficMetrix Traffic Count Database through Google Earth Pro, as provided by Kalibrate Systems. TrafficMetrix is one of the most complete commercially available traffic count database of U.S. annual daily traffic counts. These traffic counts, which frequently cover several years of data, are provided within Google Earth Pro under the licensing agreement with Michael Minor & Associates Inc. More information on the traffic counts used for the noise screening can be found on the World Wide Web at www.kalibratetech.com/trafficmetrix.

4.11.2 Existing Conditions

For the discussion of the existing noise environment, the corridor was divided into the Main Street Segment, from the Willamette River area to 69th Street, and the McVay Highway Segment from Franklin Boulevard south to the Lane County Community College. Traffic for Main Street and S A Street were

used for the analysis in the east-west corridor. For the North-south corridor, traffic from Franklin Boulevard (Highway 225), which connects to Main Street and S A Street, just west of the Willamette River Bridge, and traffic on McVay Highway were used for the analysis. It is important to note that Franklin Boulevard turns in to McVay Highway where Franklin Boulevard crosses over I-5, in the southern end of the corridor. The following section provides the results of this analysis.

4.11.2.1 Main Street Segment

A review of noise measurements taken for previous Lane Transit District projects and other projects near the corridor was performed. There are several measurements taken in 1999, east of the Willamette River, near Pioneer Parkway. Typical daytime noise levels ranged from 63 to 69 dBA Leq, with 24-hour Ldn reading predicted at 66 to 69 dBA. Although this reading was taken in 1999, the noise levels are considered valid as the traffic counts for this corridor was 9,900 in 1997, and only increased to 10,132 in 2012, an increase of only 232 vehicles. As stated above, for traffic on public roads, it takes a doubling of traffic volumes to increase noise levels by 3 dBA. An increase of 232 cars amounts to only a 2 percent, increase, and a change this small would not be expected to increase noise levels by a measurable amount. Therefore the measured noise levels would still be predicted to be in the ranges provided above.

Traffic volumes were also reviewed at several other locations along Main Street and South A Street. Typical volumes in the year 2012 ranged from 13,799 on Main and 13,400 on South A Street at 4th Street, to 13,040 on Main Street and 13,164 on South A Street at 14th Street. At the end of couplet, just west of the crossing at 21st Street where Main Street and South A Street combine, the traffic count in 2012 for both directions was 19,599. Finally, in the east end, near Highway 126, the counts reduced to 13,835 in both directions and reduced even farther east of 72nd Street, with counts of only 8,368.

The traffic data shows that the noise levels along the corridor would not vary by more than 1 to 2 dBA in the west end to Highway 126, and would reduce gradually as the corridor moves to the east, where there is less population. Based on this data, noise levels from the Willamette River east to 17th Street, just before the end of the one-way couplet, would be expected to range from 62 to 70 dBA Leq, with 24-hour Ldn reading predicted at 65 to 71 dBA. East of the couplet, where the traffic is two way, noise levels would be approximately the same, with slightly higher noise levels near Highway 126, with noise levels reducing as one moves to the less populated area to the east.

4.11.2.2 McVay Highway Segment

There are no measured noise levels in the McVay Highway Segment of this Corridor available for this screening analysis. Therefore, traffic data along with acoustical measurements in areas with similar land use and traffic patterns was used to estimate the existing noise level in this segment. Traffic counts range from 14,000 in 2002 to 13,243 in 2012 on McVay Highway just south of Franklin Boulevard. Closer to the LCC campus, on the west side of I-5 just south of the connecting ramp with I-5, volumes on McVay Highway (connects to/from Franklin Boulevard) increased slightly to 15,352.

Because this corridor serves a more industrial and commercial area, and has higher speeds (40 versus 20 to 30 on Main Street), noise levels would be expected to be slightly higher. Typically, for every 10 mph

in increased speeds, a 2 to 3 dB increase in noise levels can be expected. In contrast, however, the signalized intersections along Main Street will tend to increase noise levels slightly due to acceleration noise at intersections. Finally, as the north-south corridor appears to server more commercial uses, there could also be an increased percentage of trucks, which produce more noise than cars.

Based on the above information, the noise levels along the north end of the north-south corridor would be expected to range from 64 to 72 dBA Leq, with 24-hour Ldn reading predicted at 66 to 70 dBA. Noise levels would increase as one moves south due to increased influence from traffic along the I-5 corridor, increasing the overall noise in the southern end of the north-south corridor to 66 to 73 dBA Leq, with 24-hour Ldn reading predicted at 66 to 72 dBA.

4.11.3 Future Conditions

Future conditions noise levels would continue to be dominated by vehicles on local roadways, including Main Street, South A Street, Pioneer Parkway, South 2nd Street, Franklin Boulevard, I-5 and I-5 ramps, McVay Highway and 30th Avenue. Assuming a slight increase in traffic of up to 10 percent, noise levels in the Main Street and S A Street corridors would be expected to increase by 1 to 2 dB. Increase in the southern corridors, including Franklin Boulevard, I-5 and I-5 ramps, McVay Highway and 30th Avenue, would also be expected to increase a similar amount, or possible more depending on future development and growth in the college campus.

4.11.4 Opportunities and Constraints

There are no opportunities or constraints as related to noise. The addition of a new or improved high capacity transit service in the Corridor would not be predicted to change noise levels by a measureable (increase or decrease) amount given the current level of traffic in the corridors.

4.11.5 Conclusions

The addition of a new or improved high capacity transit service in the corridors would not be predicted to change noise levels by a measurable amount. However, because of the FTA methods and the sliding scale impact criteria, it is possible that noise impacts from the transit operation could occur in some areas that are very near to project roadways. This is not to indicate that the noise levels will increase, but to note that under certain circumstances, the FTA criteria will not allow any new noise in areas with noise levels deemed too high for residential land uses, and impacts may occur. Any impact would be mitigated, either with path mitigation, like a noise wall or earth berm, or using sound insulation and fresh air exchange systems.

4.12 Parklands and Sections 4(f) and 6(f)

Parks and recreation lands include publicly and privately owned lands used for passive and active recreation purposes, such as on-street bike lanes, sports parks, greenbelts and other undeveloped open spaces, pedestrian and bicycle trails, neighborhood parks, community centers, and public school recreation fields that are available for public use during non-school hours.

Section 4(f) applies to all historic sites listed or eligible for listing on the National Register of Historic Places (NRHP) and to publicly owned parks, recreational areas, and wildlife and waterfowl refuges. Any

project that affects Section 4(f) land must include a Section 4(f) assessment. A transportation program or project requiring the use of such land will be approved only if there is no prudent and feasible alternative to using that land and if the program or project includes all possible planning to minimize harm to the land or resources.

As described in 49 U.S.C. 303, the Section 4(f) process requires that a special effort be made to preserve the natural beauty of the countryside, public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The term "Section 4(f)" refers to the original section within the Department of Transportation (DOT) Act of 1966 which set the requirement for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development. The law is now codified in two places (49 U.S.C. 303 and 23 U.S.C. 138) and is implemented by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) through regulations found in 23 CFR 771.135 Protection of Parklands and Historic Sites. It is still commonly referred to as the Section 4(f) process. The impacts of projects on historic and cultural resources are also regulated under the Section 106 process of the National Historic Preservation Act (16 U.S.C. 4704).

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965 (16 U.S.C. 460) applies to outdoor public recreation resources that have received LWCF monies for the acquisition or development of property or facilities. The LWCF is a matching assistance program that provides grants to pay for a portion of the acquisition and development cost of outdoor recreation sites and facilities. Section 6(f) prohibits the conversion of such property to a non-recreational purpose (i.e., transit or transportation) without the approval of the Department of the Interior's National Park Service (NPS). To gain approval, applicants impacting Section 6(f) properties must provide replacement lands of equal value, location, and usefulness, and must document the replacement of property to the satisfaction of the NPS.

4.12.1 Existing Conditions

There are 16 parks and/or park facilities within the Study Area, as shown in green polygons or pink dots onFigure 4.12-1. In addition, five existing multi-use paths extend into or up to the Study Area. All parks or park facilities are owned and operated by the Willamalane Park & Recreation District except for the Glass Bar Access Park, which is an Oregon State Park. Four of these parks and park facilities have been identified as 6(f) resources: Island Park, Willamalane Park, Meadow Park, and Thurston Park. These resources include the following features and are identified on Figure 4.12-1 with red arrows.

- **Island Park**: A 14 acre park with bike and pedestrian paths, a boat landing, fishing access, natural and open areas as well as playgrounds, picnic tables and shelters.
- **Willamalane Park**: A 14 acre park with basketball and tennis courts, football, softball, and soccer fields, horseshoe pits, and a skate park. The site also includes an open play area, playgrounds, picnic tables, and shelters.
- **Meadow Park**: A 7 acre park with basketball and tennis courts, football and soccer fields, open areas, playgrounds, picnic tables, and shelters.
- **Thurston Park**: A 5 acre park with a basketball court, horseshoe pit, an open play area, and a playground.

No wildlife or waterfowl refuge has been identified in the Study Area. Wetlands and other resources that may provide habitat to sensitive species, but are not managed as "wildlife refuges" as defined by Section 4(f) guidelines, are addressed Sections 4.5 (Biological Resources and Endangered Species) and 4.18 (Wetlands and Waters of State and U.S.).

4.12.2 Future Conditions

The Willamalane Parks and Recreation District's 2012 Comprehensive Plan includes a comprehensive improvement plan. The plan identifies expansion of several existing parks and facilities as well as the development of new parks. The capital improvement plan for each park within the Study Area is included in Table 4.12-1 and shown on associatedFigure 4.12-1. It is reasonable to expect that most if not all of these projects will be completed as described within the 20-year plan timeframe.

Table 4.12-1. Proposed Park and Recreation Project by Type

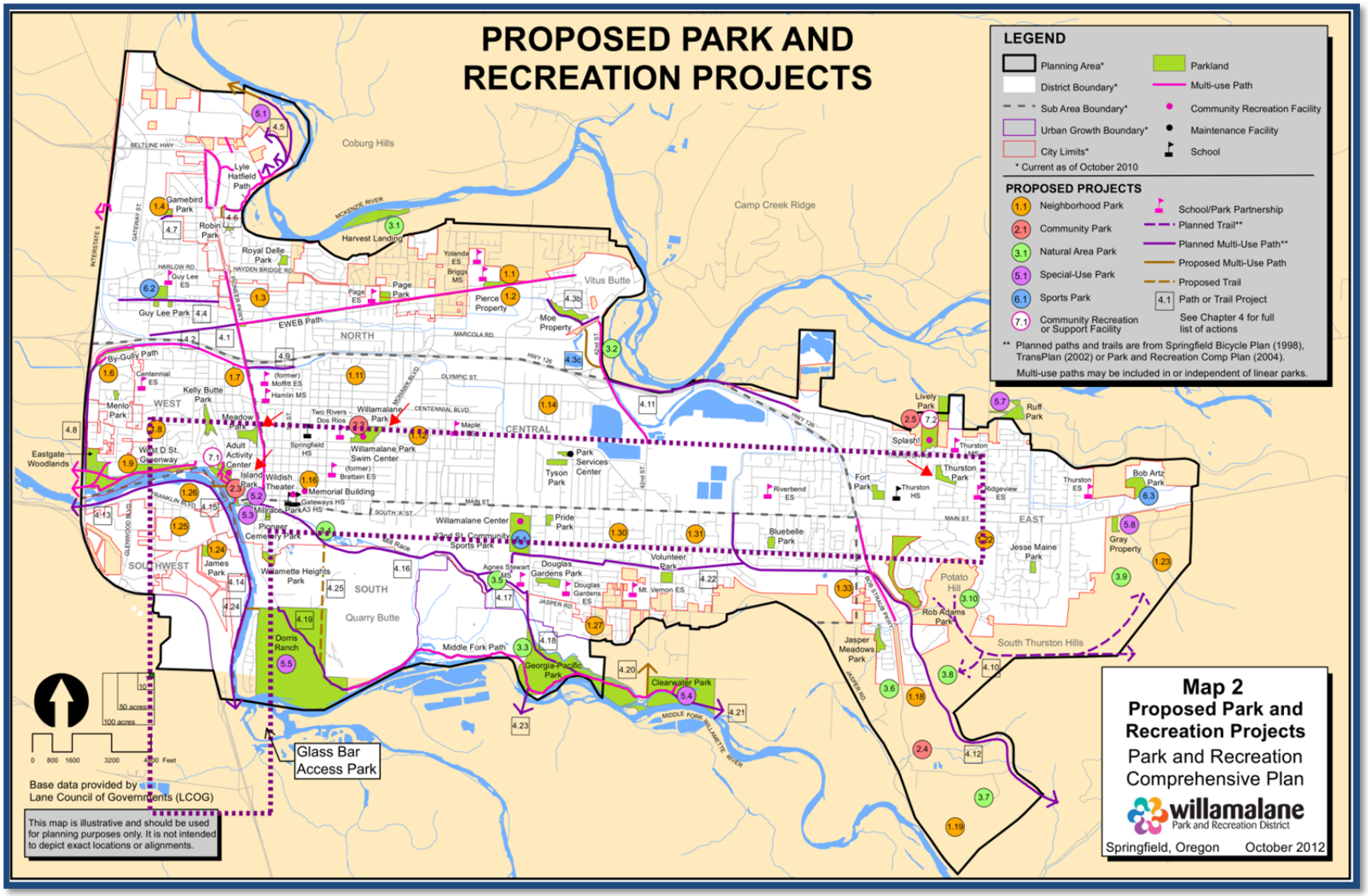
Project ID & Name	Description of Proposed Project	20-Year Plan Capital Improvement Plan Identified Project
Neighborhood Park (Orange)		
1.8 – Rainbow Drive Neighborhood Park	Pursue acquisition or partnership agreement with SPS or future developer for neighborhood park development on vacant property.	Years 2022-2031 (Acquisition and Development)
1.12 – 18th and H Neighborhood Park	Work with the city to develop the 18th and H property as a small neighborhood park in this underserved area.	Years 2012-2021 (Development)
1.16 – Post Office Park	Work with the city to explore the concept of a downtown neighborhood park, in accordance with the Downtown District Urban Design Plan.	Identified but Not Included
1.24 – James Park Expansion	Pursue vacant land acquisition and redevelopment opportunities to better connect James Park to the surrounding neighborhood and improve its utility.	Years 2012-2021 (Acquisition) Years 2022-2031 (Development)
1.25 – Central Glenwood Area Neighborhood Park	Work with the city to improve pedestrian access to nearby parks, and seek opportunities to acquire land and develop a small neighborhood park in this underserved area.	Identified but Not Included
1.26 – Glenwood Neighborhood Park Blocks	Work with the city and other partners to pursue development of neighborhood park blocks, in accordance with Glenwood Refinement Plan.	Years 2012-2021 (Acquisition and Development)
1.30 – West 42nd Street Area Neighborhood Park	Improve access from this underserved area to nearby parks and schools; pursue acquisition and redevelopment of a neighborhood park as opportunities arise.	Identified but Not Included
1.31 – East 42nd Street Area Neighborhood Park	Improve access from this underserved area to nearby parks and schools; pursue acquisition and redevelopment of a neighborhood park as opportunities arise.	Identified but Not Included
Community Park (Red)		
2.2 – Willamalane Park/SPS Coordination	Work with SPS to optimize use of Willamalane Park and adjacent school grounds for public recreation	Years 2012-2021 (Acquisition)

Project ID & Name	Description of Proposed Project	20-Year Plan Capital Improvement Plan Identified Project
2.3 – Willamalane Park Expansion	Work with SPS to explore acquisition of the eastern portion of the elementary school property, which is currently used as parkland.	Years 2012-2021 (Acquisition and Development)
Natural Area Park (Green)		
3.4 – Georgia-Pacific Park	Work with the city and Springfield Utility Board (SUB) to develop and implement a management plan and master plan for a natural-area park at the jointly owned Georgia-Pacific property.	Years 2012-2021 (Acquisition)
Path or Trail Project (Purple or Brown Line)		
4.13 – Glenwood Riverfront Linear Park A [851]	Work with partners to develop a riverfront linear park and multiuse path from I-5 to the Springfield Bridge, consistent with the Glenwood Refinement Plan.	Years 2012-2021 (Acquisition) Years 2022-2031 (Development)
4.14 – Glenwood Riverfront Linear Park B [854]	Work with partners to develop a riverfront linear park and multiuse path from the Springfield Bridge to Seavey Loop Road.	Years 2022-2031 (Acquisition)
4.15 – Glenwood to Island Park (Bridge)	Work with the city to explore the feasibility of a bicycle/pedestrian bridge from the South Bank Path A to Island Park, per the Downtown District Urban Design Plan.	Identified but Not Included
4.16 – Lower Mill Race Path (39) [840]	Work with the city and partners to develop a 1.6-mile, multiuse trail along the Mill Race (South Second to South 28th Street), with an on-street connection to South Fifth Street.	Years 2012-2021 (Acquisition & Development)
4.24 – Glenwood to Dorris Ranch (Bridge)	Work with partners to explore the feasibility of developing a bicycle and pedestrian bridge across the Willamette River, connecting the Glenwood Riverfront Linear Park B to Dorris Ranch and the Middle Fork Path.	Identified but Not Included
4.25 – Booth-Kelly to Dorris Ranch Trail	Work with interested parties to explore hiking and mountain biking opportunities between the Booth-Kelly/Mill Pond Park, Willamette Heights and Dorris Ranch.	Years 2022-2031 (Development)
Special Use Park (Purple)		
5.2 – Mill Plaza	Work with the city and other partners to explore the feasibility of developing an urban plaza downtown, consistent with the Downtown District Urban Design Plan.	Identified but Not Included
5.3 – Central Mill Race Park Expansion	Explore expansion of Millrace Park to the south.	Identified but Not Included
5.5 – Dorris Ranch Master Plan Implementation	Continue implementing the Dorris Ranch Master Plan.	Years 2012-2021 (Development) Years 2022-2031 (Development)
Sports Park (Blue)		
6.1 –32nd Street Community Sports Park	Complete sports park development, consistent with the 2004 site development plan, which will also help meet community park needs.	Years 2012-2021 (Development)
Community Recreation or Support Facility (White)		

Project ID & Name	Description of Proposed Project	20-Year Plan Capital Improvement Plan Identified Project
7.1 – Adult Activity Center Parking	Explore options for additional parking, per Park and Facility Analysis.	Years 2012-2021 (Acquisition) Years 2022-2031 (Development)

Source: Willamalane Park and Recreation District. 2012.

Figure 4.12-1. Existing and Proposed Park and Recreation Projects



Main-McVay Transit Study Area shown with Purple Dashed Line
Source: Willamalane Park and Recreation District. 2012.

4.12.3 Opportunities and Constraints

The existing and proposed parks, facilities and multi-use trails within the Study Area offer a unique draw for transit users as parks and facilities are local and regional destinations, and multi-use trails are used to access transit or to continue multi-modal travel.

Impacts on parks, and particularly those with a 6(f) classification, is a constraint that should be carefully considered in developing transit options for the corridor.

4.12.4 Conclusions

Any project identified from this study should take particular effort to avoid impacts to all park facilities, particularly those identified as 6(f) resources.

4.13 Socioeconomics and Environmental Justice

This section provides a summary of the social and economic conditions within the Study Area, including population characteristics and environmental justice considerations.

4.13.1 Existing Conditions

4.13.1.1 Social and Environmental Justice

Table 4.13-1 through Table 4.13-6 detail the demographic and household characteristics within transportation analysis zones (TAZ) located in the Main-McVay Study Area (Figure 4.13-1). Also included in the tables for comparative purposes is information for the State of Oregon, Lane County and the cities of Springfield and Eugene.

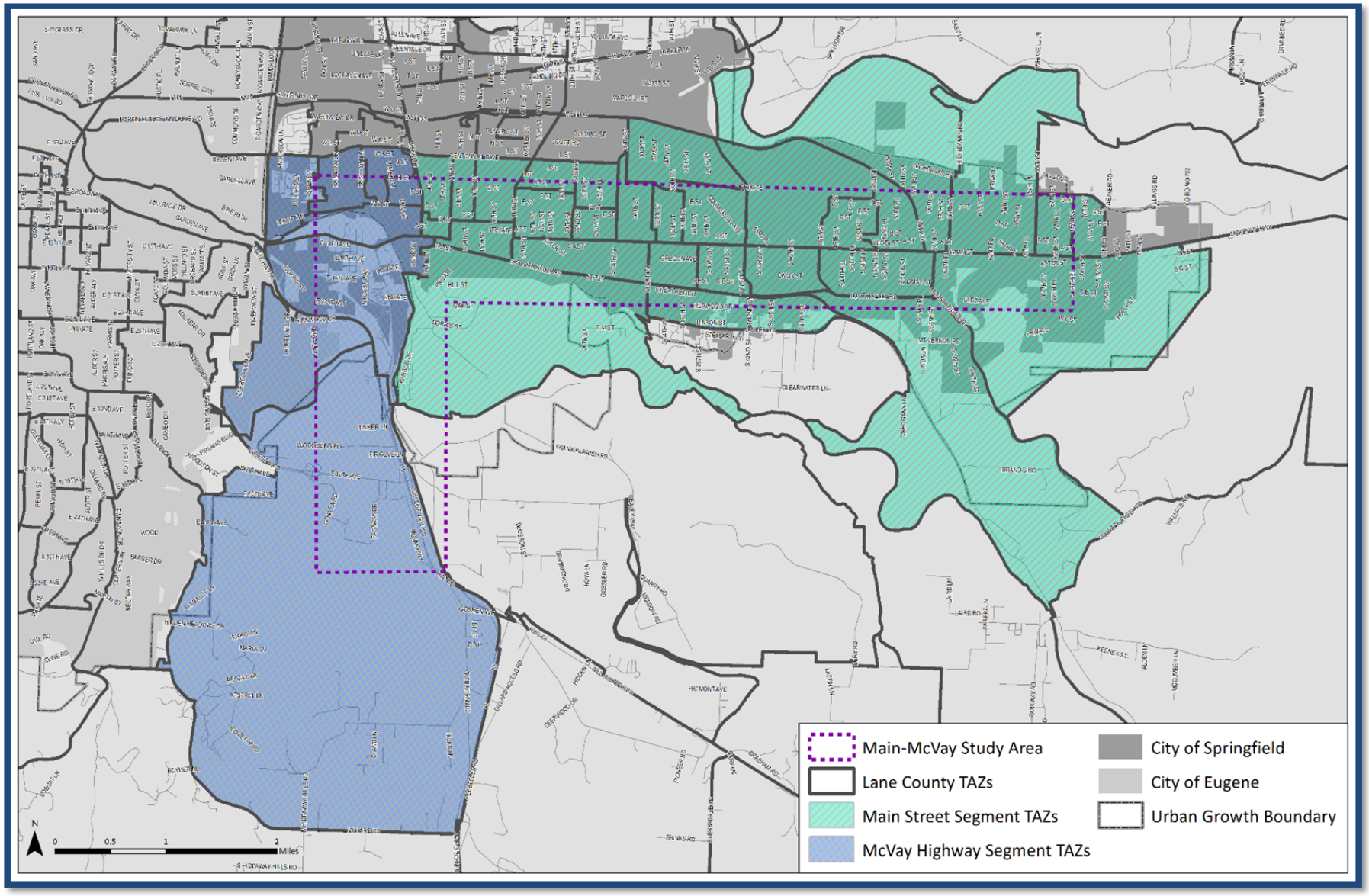
The Main-McVay Study Area TAZs comprise about 12 percent of Lane County's total population, as detailed in Table 4.13-1. About 83 percent of the Study Area population resides within the Main Street Segment TAZs, with only approximately 17 percent along the McVay Highway Segment TAZs. Although employment opportunities are split fairly evenly along the Main Street and McVay Highway Segments, workers tend to be concentrated in the TAZs located along the Main Street Segment, as shown on Figure 4.13-2.

Table 4.13-1. Study Area Population and Employment

	Population	Workers	Employment
Study Area Total (TAZs)	**40,987**	**16,077**	**15,777**
Main Street TAZs	34,118	13,110	8,784
McVay Hwy TAZs	6,869	2,967	6,993
State of Oregon	3,831,074	1,519,429	1,567,217
Lane County	351,715	135,626	135,718
Springfield	51,881	20,156	19,632
Eugene	147,168	57,602	79,414

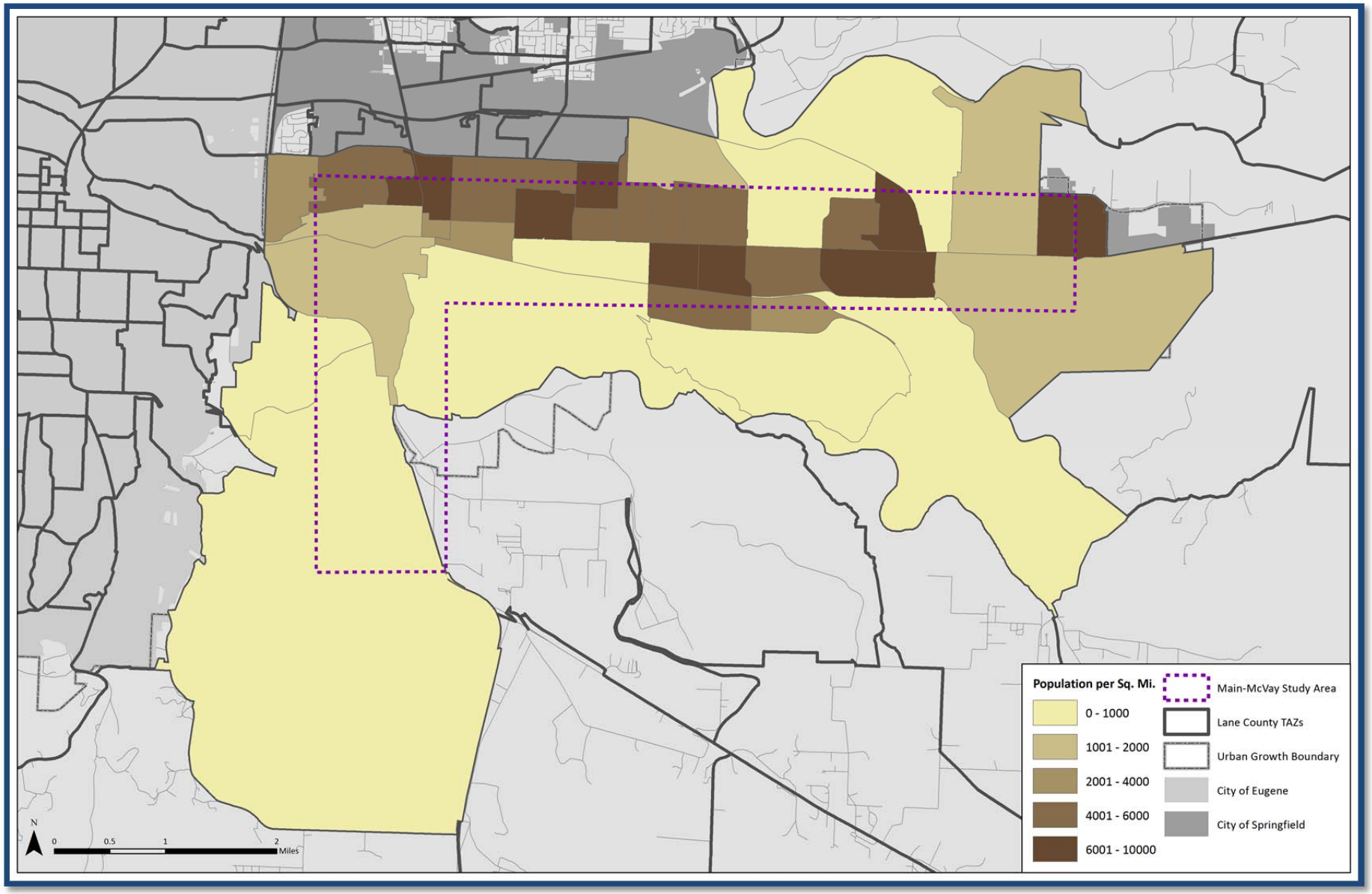
Source: 2010 U.S. Census Bureau by TAZ. 2014.

Figure 4.13-1. Main-McVay Study Area Transportation Analysis Zones (TAZs)



Source: Prepared by Parsons Brinckerhoff from 2010 U.S. Census Data. 2014.

Figure 4.13-2. Total Population by TAZ per Square Mile



Source: Prepared by Parsons Brinckerhoff from 2010 U.S. Census Data. 2014.

As indicated on Table 4.13-2, the Study Area TAZs as a whole have a lower percentage of residents 65 years old and older, at 11 percent, than do the State, County, and the cities of Eugene and Springfield. Correspondingly, the Study Area TAZs have a higher percentage of youths (under 18 years old) compared to most of the other geographies. However, when looking at the Study Area Segments, it is apparent the Main Street Segment, which includes most of the Study Area population, is driving this tendency for higher numbers of youth and fewer elderly. The McVay Highway Segment has a relatively low percentage of youth and higher percentage of elderly. Still, the Main Street Segment is more dense and, as shown on Figure 4.13-3, there are more elderly per square foot along Main Street, particularly east of 41st street and north of Main Street, west of 41st Street.

Table 4.13-2. Study Area Age

Age	<18	18-65	65+
Study Area Total (TAZs)	**24%**	**65%**	**11%**
Main Street Segment TAZs	25%	64%	11%
McVay Hwy Segment TAZs	18%	68%	14%
State of Oregon	23%	63%	14%
Lane County	20%	65%	15%
Springfield	24%	64%	12%
Eugene	18%	69%	13%

Source: 2010 U.S. Census Bureau by TAZ. 2014.

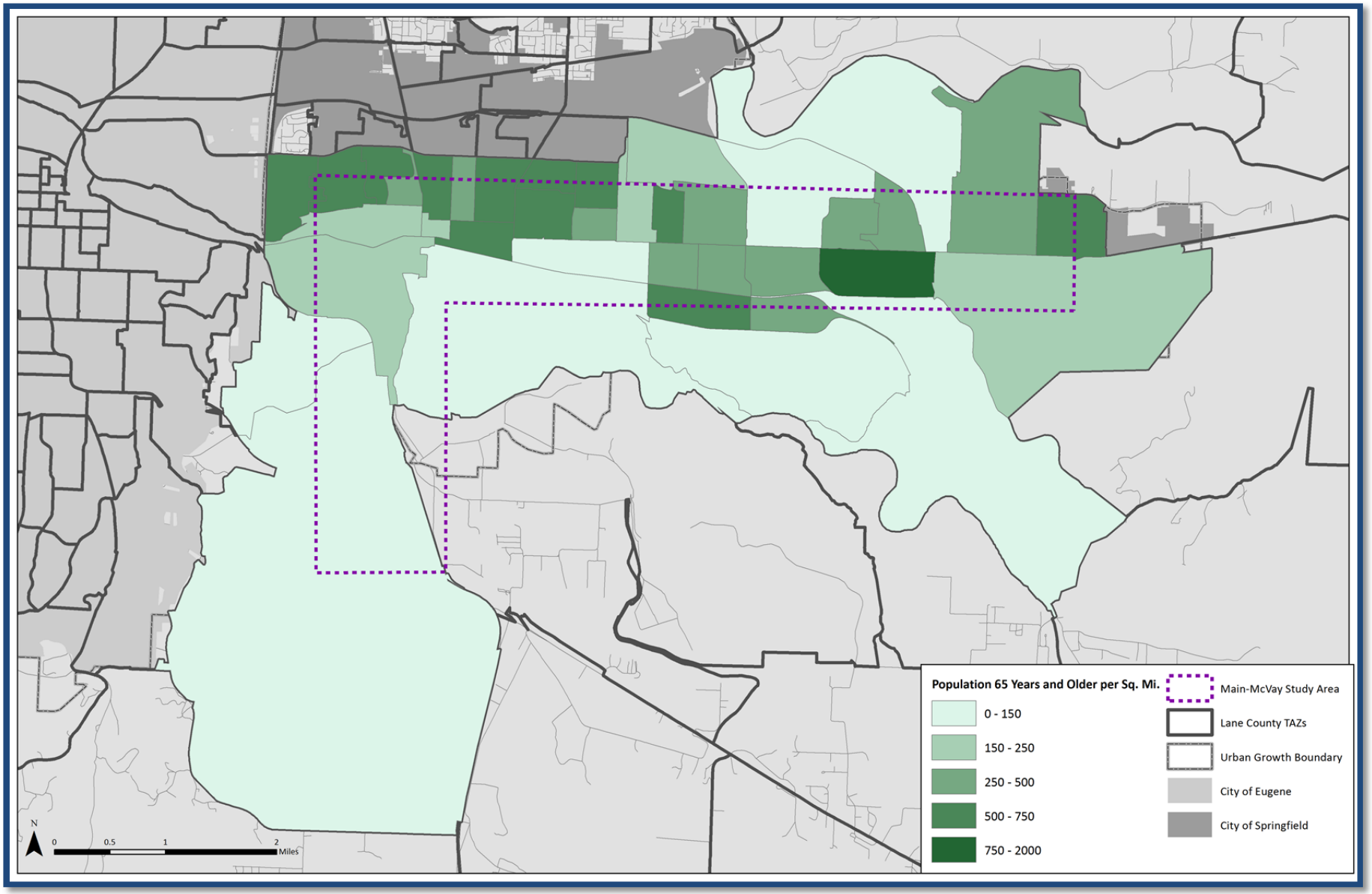
The Study Area TAZs generally follow the state, county, Springfield and Eugene trends when it comes to race and ethnicity, as shown inTable 4.13-3. The greatest variations tend to be in the percent of Asian ethnicity, which ranges from one percent in the corridor and in Springfield, to 4 percent in Eugene and the State.

Table 4.13-3. Study Area Race and Ethnicity

	White	Asian	Black	American Indian	Other*
Study Area Total (TAZs)	**87%**	**1%**	**1%**	**1%**	**11%**
Main Street Segment TAZs	87%	1%	1%	1%	11%
McVay Hwy Segment TAZs	87%	2%	1%	1%	10%
State of Oregon	84%	4%	2%	1%	11%
Lane County	88%	2%	1%	1%	8%
Springfield	86%	1%	1%	1%	12%
Eugene	86%	4%	1%	1%	9%

*"Other" includes Pacific Islander, multiracial, and any other race.
Source: 2010 U.S. Census Bureau by TAZ. 2014.

Figure 4.13-3. Age within the Study Area TAZs



Source: Prepared by Parsons Brinckerhoff from 2010 U.S. Census Data. 2014.

As detailed inTable 4.13-4, household income stratification within the Study Area TAZs generally follows that of the state, county, and cities of Springfield and Eugene. A noticeable outlier is the household income greater than $75,000. In the Study Area TAZs, about 16 percent of households have an income of greater than $75,000, which is similar to of Springfield. However, the state, county, and city of Eugene household income greater than $75,000 are 30 percent, 24 percent, and 24 percent, respectively.

There are considerably more households with an income less than $25,000 within the McVay Highway Segment TAZs as compared to the other geographies, at 39 percent compared to a range of 24 percent to 33 percent for the other geographies. However, the density of households with an income less than $25,000 is primarily within the Main Street Segment, as shown on Figure 4.13-4. There appears to be several areas where these lower household incomes are prevalent, including: between 57th Street and 48th Street; between 41st Street and 32nd Street; and between 22nd Street and Pioneer Parkway.

Table 4.13-4. Study Area Household Income

	<$25K	$25K-$50K	$50K-$75K	>$75K
Study Area Total (TAZs)	**31%**	**31%**	**21%**	**16%**
Main Street Segment TAZs	30%	33%	22%	16%
McVay Hwy Segment TAZs	39%	25%	16%	20%
State of Oregon	24%	26%	20%	30%
Lane County	29%	27%	20%	24%
Springfield	32%	32%	20%	15%
Eugene	33%	25%	18%	24%

Source: 2010 U.S. Census Bureau by TAZ. 2014.

On average, more Study Area households travel to work by driving alone as compared to those within the state, county, city of Springfield, and city of Eugene; 80 percent compared to 77 percent, 75 percent, 78 percent and 68 percent, respectively (see 14.13-5). However, the Study Area households, and residences within the city of Springfield, carpool on average more than those in the rest of the state, county and in the city of Eugene. Public transportation use within the Study Area TAZs is comparable to that in the state and the county, at 4 percent; however, it is lower than in Springfield and Eugene, at 5 percent and 6 percent respectively. Use of other transportation modes, such as bicycling or walking, in the Study Area TAZs is lower on average when compared to the state, county, Springfield and Eugene, at 4 percent compared to 7 percent, 10 percent, 5 percent and 16 percent. Figure 4.13-5 shows the density of transit commuters per square mile within each TAZ. As shown, most transit users are north of Main Street. TAZs with the highest transit use include those north of Main Street between 57th Street and 52nd Street, 28th Street and 14th Street, and 7th Street and Water Street.

Table 4.13-5. Study Area Travel Mode to Work

	Drove Alone	Carpooled	Public Transportation	Other
Study Area Total (TAZs)	**80%**	**12%**	**4%**	**4%**
Main Street Segment TAZs	80%	12%	4%	4%
McVay Hwy Segment TAZs	80%	9%	4%	7%
State of Oregon	77%	11%	4%	7%
Lane County	75%	10%	4%	10%
Springfield	78%	12%	5%	5%
Eugene	68%	9%	6%	16%

Source: 2010 U.S. Census Bureau by TAZ. 2014.

Vehicle ownership, or lack of ownership, is a good indicator of potential public transit use and/or reliance on transit as a main mode of travel. Table 4.13-6 details the vehicle ownership characteristics of the households within the Study Area TAZs as compared to the state, county, Springfield and Eugene. There are similarities between the Study Area and the larger geographies in most of the car ownership categories. The category "Households owning two vehicles" is the one category that has a higher percentage of ownership in the Study Area TAZs compared to all other geographies, 41 percent as compared to a range between 36 and 39 percent for the other geographies.

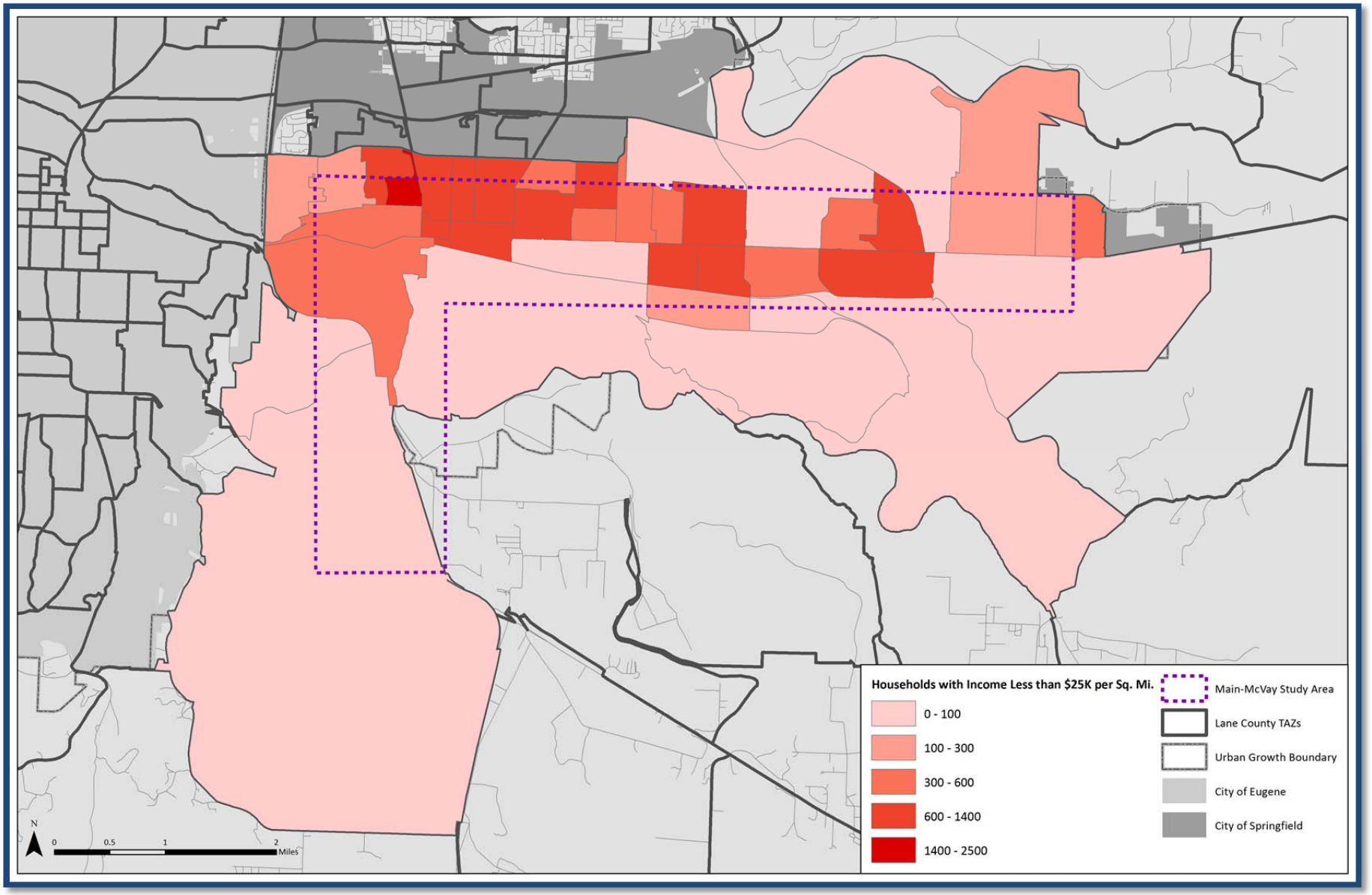
When comparing household vehicle ownership between the Main Street and McVay Highway Segments, it is apparent households within the McVay Highway TAZs tend to have fewer cars than do those households in TAZs along the Main Street Segment. As shown on Figure 4.13-7, the households without access to vehicles generally reside within similar TAZs as those where there is higher proportion of transit use.

Table 4.13-6. Household Vehicle Ownership in the Study Area

	None	1	2	3	4	5 or More
Study Area Total (TAZs)	**8%**	**32%**	**41%**	**14%**	**4%**	**2%**
Main Street Segment TAZs	8%	30%	42%	14%	4%	2%
McVay Hwy Segment TAZs	10%	40%	34%	11%	3%	4%
State of Oregon	8%	32%	38%	15%	5%	2%
Lane County	8%	32%	38%	15%	4%	2%
Springfield	10%	33%	39%	13%	4%	2%
Eugene	11%	39%	36%	11%	3%	1%

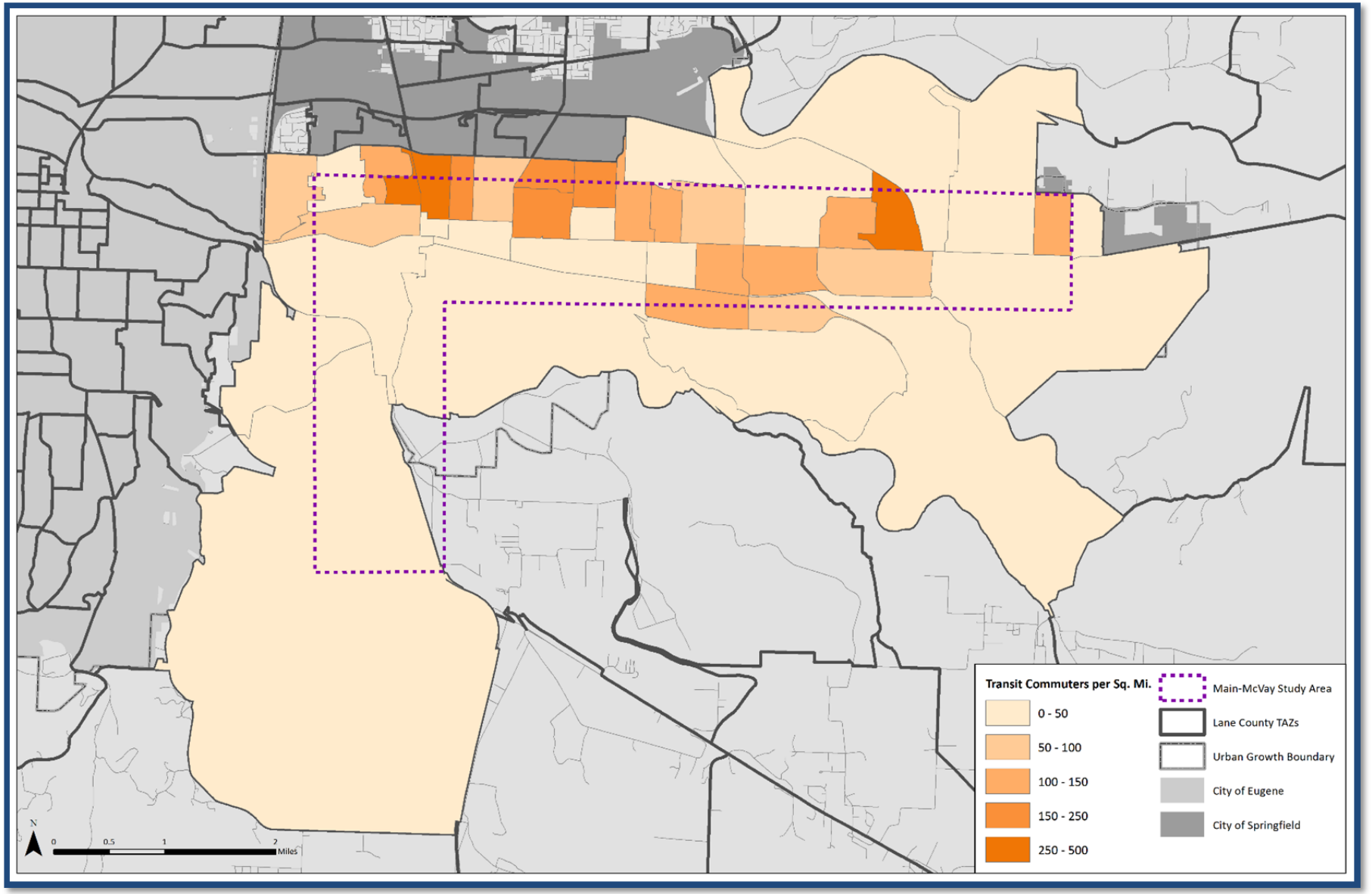
Source: 2010 U.S. Census Bureau by TAZ. 2014.

Figure 4.13-4. Household Income Less than $25,000 within the Study Area TAZs



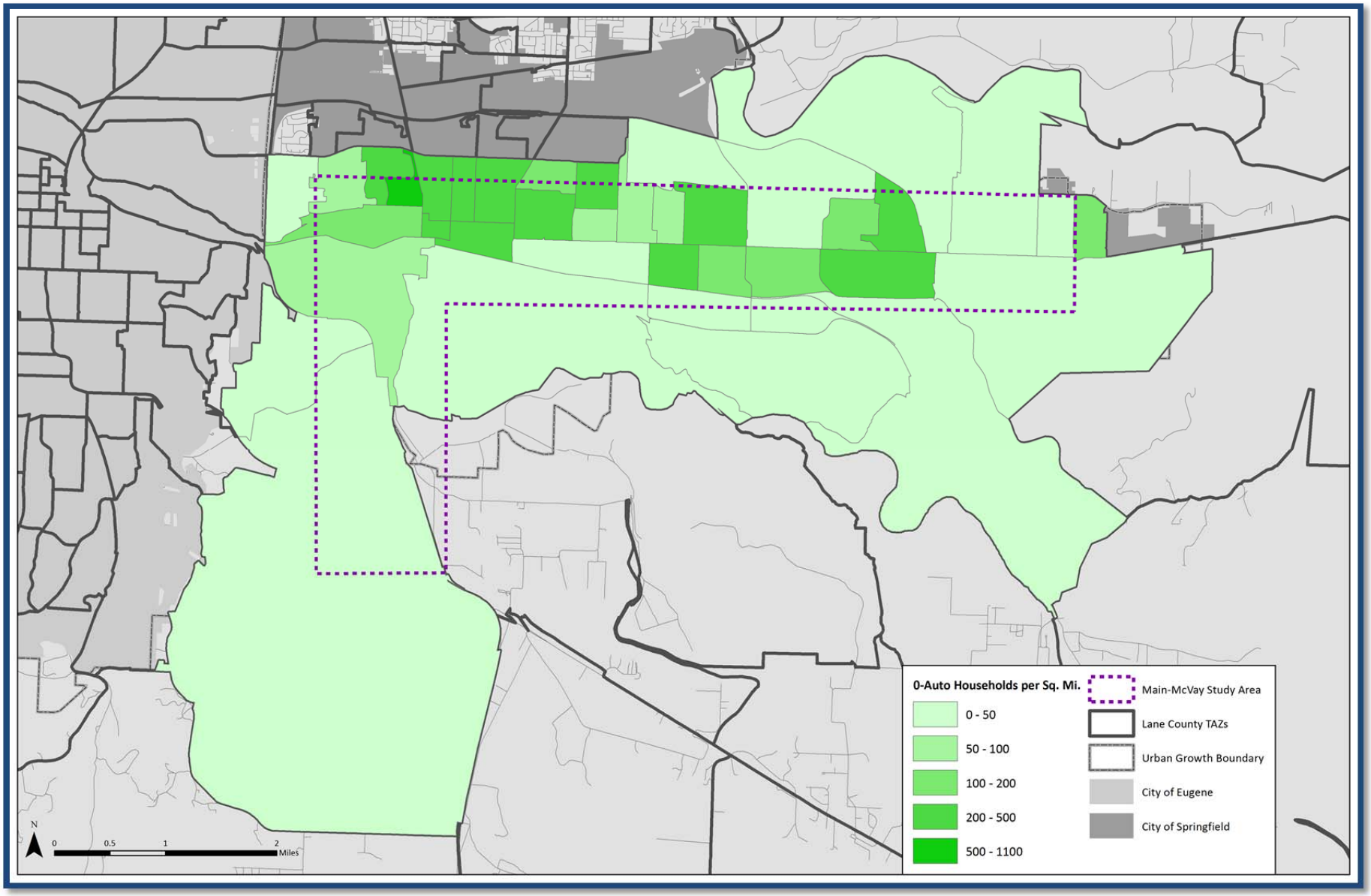
Source: Prepared by Parsons Brinckerhoff from 2010 U.S. Census Data. 2014

Figure 4.13-6. Transit Commuters within the Study Area TAZs



Source: Prepared by Parsons Brinckerhoff from 2010 U.S. Census Data. 2014

Figure 4.13-7. Households without Vehicle Access within the Study Area TAZs



Source: Prepared by Parsons Brinckerhoff from 2010 U.S. Census Data. 2014.

4.13.1.2 Neighborhoods

There are nine recognized neighborhood districts within the Study Area, as shown on Figure 14.13-8; from east to west they are Thurston, South Springfield, East Main, Mid-Springfield, Mohawk, Downtown, East Kelly Butte, West Springfield, and Glenwood. Of these six have developed refinement plans. The refinement plans are developed from the Eugene-Springfield Metropolitan Area General Plan (Metro Plan), which shows the general location of land use districts, to be more specific area plans. The city of Springfield is developing a city-wide refinement plan, called the Springfield 2030 Refinement Plan, which will guide growth and development within Springfield (Springfield, 2010b). Each neighborhood refinement plan will be updated as a part of this ongoing process. Below is a description of the neighborhood refinement plans within the Study Area

East Main Refinement Plan

The heart of the East Main neighborhood is Main Street. It is bounded to the north and east by 126 and Bob Straub Parkway, south by Jasper Road, and west by 42nd Street. Along Main Street the refinement plan calls for mixed uses. North and south of 42nd Street the plan calls for community commercial. Medium then low density residential uses are designated as the neighborhood expands away from Main Street. The only difference is a large swath of industrial designations north of Main Street between 42nd Street and 48th Street.

Mid-Springfield Refinement Plan

Similar to the East Main neighborhood, the Mid-Springfield neighborhood's backbone is Main Street. This neighborhood is bounded by 126 to the north, 42nd Street to the east, Booth Kelly Road to the south and the railroad to the west. Along the entire length of Main Street the refinement plan calls for commercial uses as one travels away from main street in both directions are medium and low density residential designations. Centered along the railroad tracks to the north within the refinement plan area is a large swath of industrial designated land with a patch of low density residential in the middle.

Mohawk Boulevard Specific Development Plan

The southern boundary of the Mohawk neighborhood is just clipped by the Study Area. Although there is a wide variety of zoning designations within this neighborhood, only low density residential designations are within the Study Area. This Study Area is bounded by 126 to the north, 21st Street to the east, E Street to the south and 10th-to-12th Street on the west, jogging east at J Street.

Springfield Downtown Refinement Plan

Downtown Springfield is the governmental and cultural center of the city, as described in Section 4.10, Land Use and Prime Agricultural Lands. This neighborhood is roughly bounded by W B Street to the north, 10th street north of the railroad tracks, Mill Pond to the south with a jog west along the Mill Race waterway, and the Willamette River to the west. Mixed use and governmental use designations are predominate in this neighborhood. Along the Willamette River is a large park.

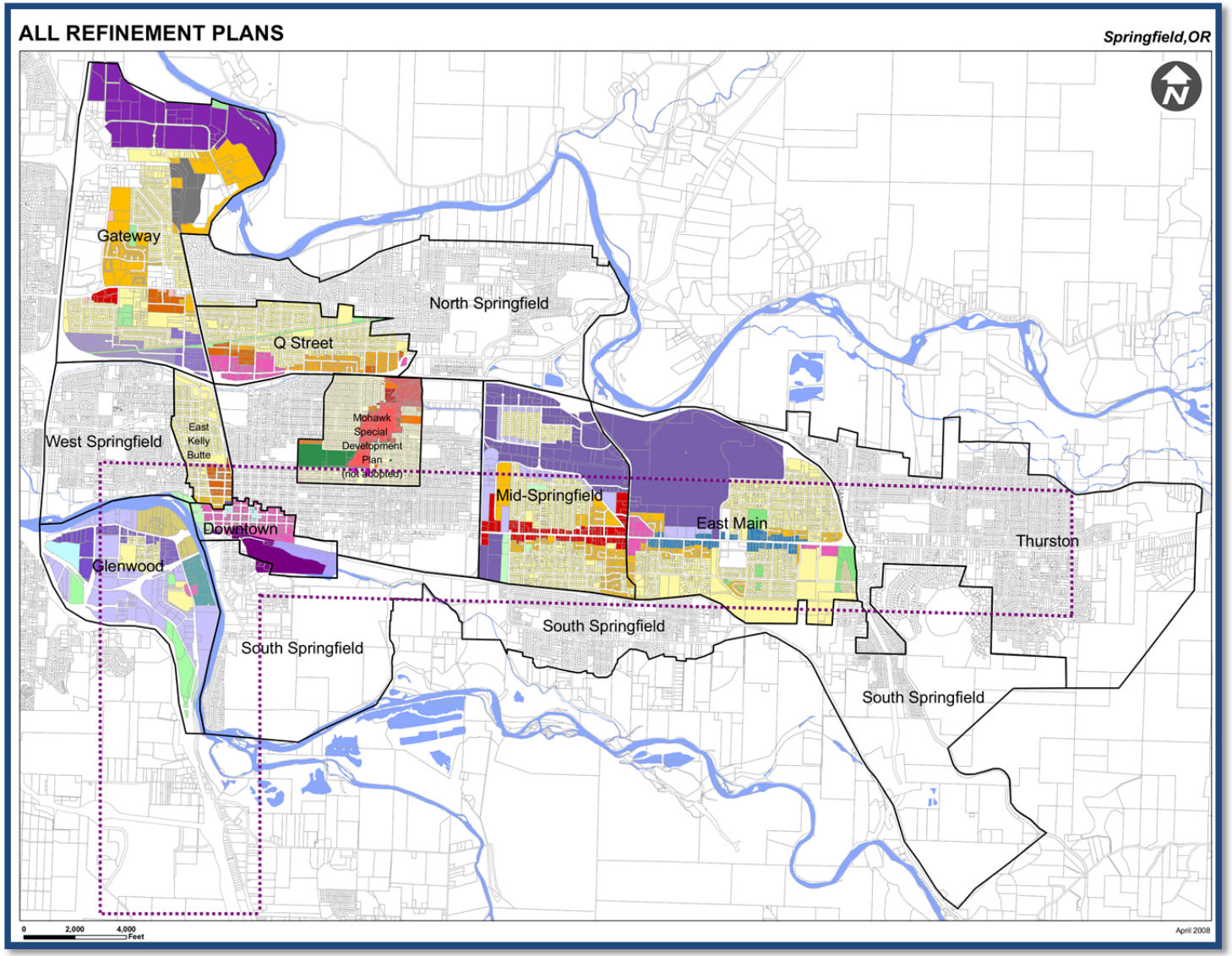
East Kelly Butte Refinement Plan

The southern half of East Kelly Butte is within the Study Area. This refinement plan is bounded by 126 to the north, Pioneer Parkway to the east, W B Street to the south and, roughly, Kelly Blvd. to the west. The predominant land use designations are high and medium density residential with lower density residential north ward away from the Study Area. There is one block of mixed use designation on W B Street and Pioneer Parkway.

Glenwood Refinement Plan

The Glenwood neighborhood is bounded by the Willamette River and I-5. A portion of the Glenwood Refinement Plan that fronts along the Willamette River was updated and adopted in October 2012. This plan calls for employment mixed use along Franklin Blvd south of Main Street; office mixed use east of i-5 along Franklin Blvd. to about Henderson Avenue; residential mixed use between Henderson Avenue to about Concord Street; and commercial mixed use in the patch of land east of Concord Street and north of Main Street. The center of the Glenwood Refinement Plan has yet to be update. It is currently a mix of industrial and low density land uses.

Figure 4.13-8. Main-McVay Study Area Neighborhoods



Source: City of Springfield, Oregon. 2010a.

4.13.1.3 Economics

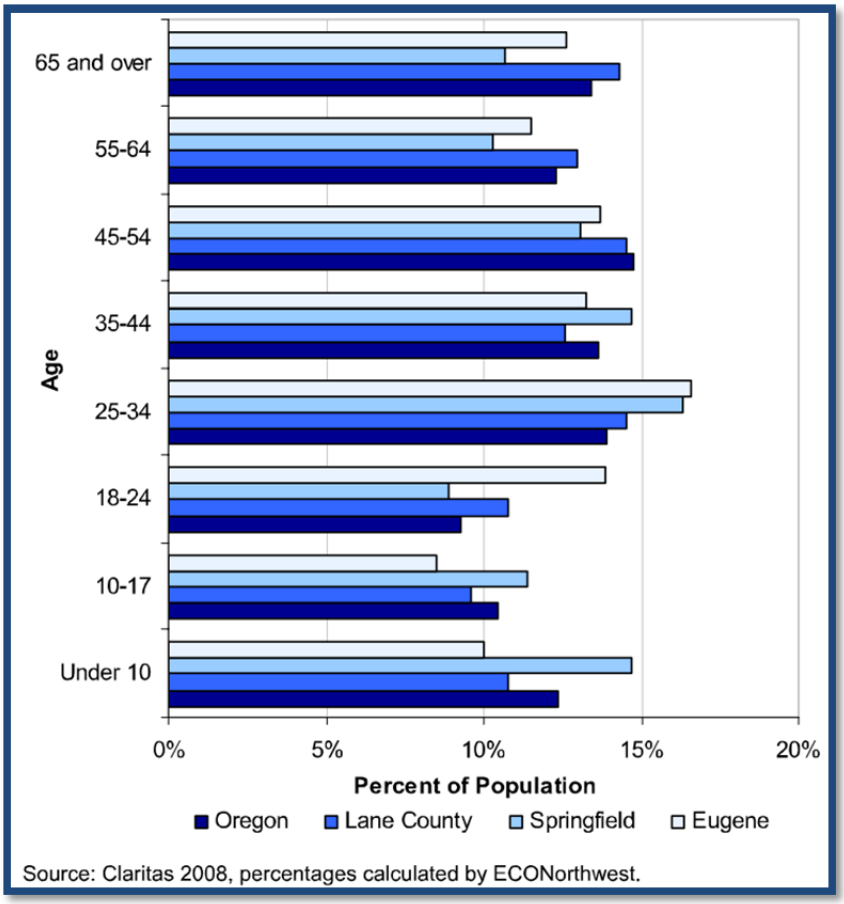
The Study Area accommodates a large proportion of the city of Springfield; therefore, this section provides an overview of economic conditions within the city of Springfield. In general, the economic conditions within the city of Springfield follow those within the greater region. Major differences, as identified in the Springfield Economic Opportunity Analysis (ECONorthwest, 2009), include:

Availability of Labor

Springfield's population grew faster than the County average by 1.5 percent between 1990 and 2007. Migration was the largest component of growth in Oregon and Lane County during that time.

The average age of Springfield's residents is increasing; between 2000 and 2008 the age group that increased the most was people aged between 45 to 64, which increased 24 percent. During this same time people aged between 18 to 24 shrunk by 16 percent. Still, Springfield's population was younger than the County or State averages in 2008, as shown in Figure 4.13-9.

Figure 4.13-9. Population by age, Oregon, Lane County, Eugene, and Springfield, 200-2008



Source: ECONorthwest, 2009.

Springfield, as well as Lane County, has low average income when compared to Oregon and the U.S. At the same time, Springfield has a highly educated population with a high labor force population. These trends make Springfield attractive to firms considering a move within the U.S.

Changes in Employment

Lane County and the Eugene-Springfield area has followed the national shift from manufacturing and resource-intensive industries to service-oriented sectors of the economy. Some industries in the region are volatile and typically have a boom and bust cycle, such as the RV manufacturing industry and some high-tech companies. In 2006, employment in retail, government, health care and social assistance, and manufacturing were the sectors with the greatest number of employees within Springfield (65 percent of all jobs).

4.13.2 Future Conditions

Lane County is projected to grow to 451,038 people by 2035, a population increase of 22 percent compared to the 2010 population of 351,715 people. It is anticipated a portion of that population growth will occur within the Main-McVay Study Area.

It is likely that changes in demographics, income, and car ownership within the Study Area will be consistent with the regional and state trends. This information was summarized in the April 2011 Springfield Housing Needs Analysis and is as follows (Springfield, 2011):

- Oregon's minority population is growing quickly. Minorities made up 92 percent of the population in 1990 and 16.5 percent of the population in 2000 a 52 increase.
- Hispanics and Latinos make up a large share of that population and their growth rate is higher than non-Hispanics/Latinos. The growth rate of Oregon's non-Hispanic/Latino population between 1990 and 2000 was 15.3 percent compared to 144.3 for Hispanics and Latinos.
- The birth rates of Hispanic/Latino residents are higher than non-Hispanic/Latino residents. In 1998 for the US white non-Hispanic/Latino residents had a birth rate of 12.3 per 1,000, lower than Asians and Pacific Islanders (16.4 per 1,000), black non-Hispanics (18.2 per 1,000) and Hispanic/Latino (24.3 per 1,000).
- The share of resident births and deaths in Oregon shows the implications of that birth rate Hispanic/Latino residents accounted for 17.4 percent of births but only 14 percent of deaths in Oregon for 2001. In addition Hispanic/Latino Oregonians are younger than non-Hispanic/Latino residents: in 2,000, 75.9 percent of Hispanic/Latino residents of Oregon are under age 35 compared to 45.7 percent of non-Hispanic/Latino residents.
- In Oregon Hispanic/Latino per capita income in 2005 was only 44 percent of white per capita income.
- Hispanic/Latino residents of Oregon become homeowners at younger ages than non-Hispanic/Latino residents.

Sectors with high employment concentration in Springfield and high growth forecasts are the industries that are most likely to grow. The Springfield Economic Opportunities Analysis identified the sectors within Springfield that are likely to grow to be: Health and Social Assistance; Administrative and Support and Waste Management Services; Construction; and Accommodations with Food Services (ECONorthwest, 2009).

4.13.3 Opportunities and Constraints

The fact that the corridor has relatively low use of public transportation suggests an opportunity to improve transit use through improved service options. The corridor demographics, including relatively high levels of youth and a tendency toward lower incomes, suggest a potential transit market. In addition, expected population and employment growth within the Study Area provides a future market for transit.

The corridor has relatively high auto ownership rates, which could discourage use of transit.

4.13.4 Conclusions

Corridor demographics tend to support the provision of higher quality transit service, particularly along the Main Street Segment with its higher population base.

4.14 Transportation

Existing documentation of traffic related data along the Main – McVay corridor was explored. A majority of the corridor is in within Springfield city limits, with a little over one-half mile of McVay Highway in Lane County. Both Main Street and McVay Highway are ODOT facilities. Since the Main Street Segment and the McVay Highway Segment are characteristically different, information is presented separately for each segment. Transportation information is described by mode for motor vehicles, transit, bicycle and pedestrian and freight. A number of attachments from previous studies are included.

4.14.1 Motor Vehicles

Available motor vehicle data from previous studies includes roadway jurisdiction, classification and performance standards, existing and future congestion issues, safety issues and priority improvement projects. Each of these is summarized below.

4.14.1.1 Roadway Jurisdiction, Functional Classification and Roadway Performance Standards

Table 4.14-1 summarizes the functional classification and freight designations by both the city of Springfield's Transportation System Plan and ODOT's Highway Plan. Intersection performance standards are based on jurisdiction and roadway classification.