3. Needs Assessment

An inventory of the existing transportation system presented a snapshot of how transportation is provided to Lincoln and Lancaster County residents today. This chapter documents the current conditions of the multimodal transportation system and the future conditions based on the anticipated growth in the region. The primary purpose of this chapter is to assess the current and future roadway, bicycle, pedestrian, transit, freight, and rail systems.

Land Use and Demographics

Demographics are a key component of understanding the transportation system and anticipating where new or improved facilities may be located. Housing and employment are the two main demographic categories used in forecasting travel demand.

Not only does the number of people living and working in the region affect the transportation needs, but *where* people choose to live and work greatly influences the demand for transportation infrastructure and services. Understanding the region's existing and future housing and employment trends can help to inform and guide transportation investment decisions. Today's decisions must consider the changing needs of our population and align with future transportation needs.

Household and Employment Growth

The US Census estimates a 2014 population of 272,996 in Lincoln and 301,795 in Lancaster County, representing a 5.6 percent and 5.7 percent increase over the 2010 populations, respectively. The 2015 base year travel demand model for Lincoln includes more than 113,000 households. Based on the Lincoln-Lancaster County Comprehensive Plan Update (LPlan 2040) land use forecasts, the number of households within the model area is expected to grow by nearly 44,000 over the next 25 years (a 39 percent increase). **Figure 3** shows the distribution of household growth within the model area (the "Cordon Area"). Darker colors represent higher levels of household growth; most high growth areas are on the periphery of the future service limit.

Similarly, **Figure 4 and Figure 5** depict the commercial and industrial employment growth, respectively. Commercial employment is expected to increase by approximately 35 percent, and industrial employment by 47 percent. **Table 1** shows the 2015 base year, 2040, and interim 2026 household and employment forecasts within the model area. **Appendix C** documents the detailed land use forecasts by transportation analysis zone (TAZ).

Table 1. Household and Employment Growth

	2015	2026	2040	11-year Growth (2015 to 2026)	25-year Growth (2015 to 2040)
Households	113,018	132,595	156,825	19,577	43,807
Commercial Space (1000 SF)	43,675	49,604	58,915	5,929	15,240
Industrial Area (Acres)	3,194	3,943	4,686	749	1,492

HOUSEHOLD AND EMPLOYMENT FORECASTS FOR THE CORDON AREA, AS DEPICTED ON THE MAPS THAT FOLLOW

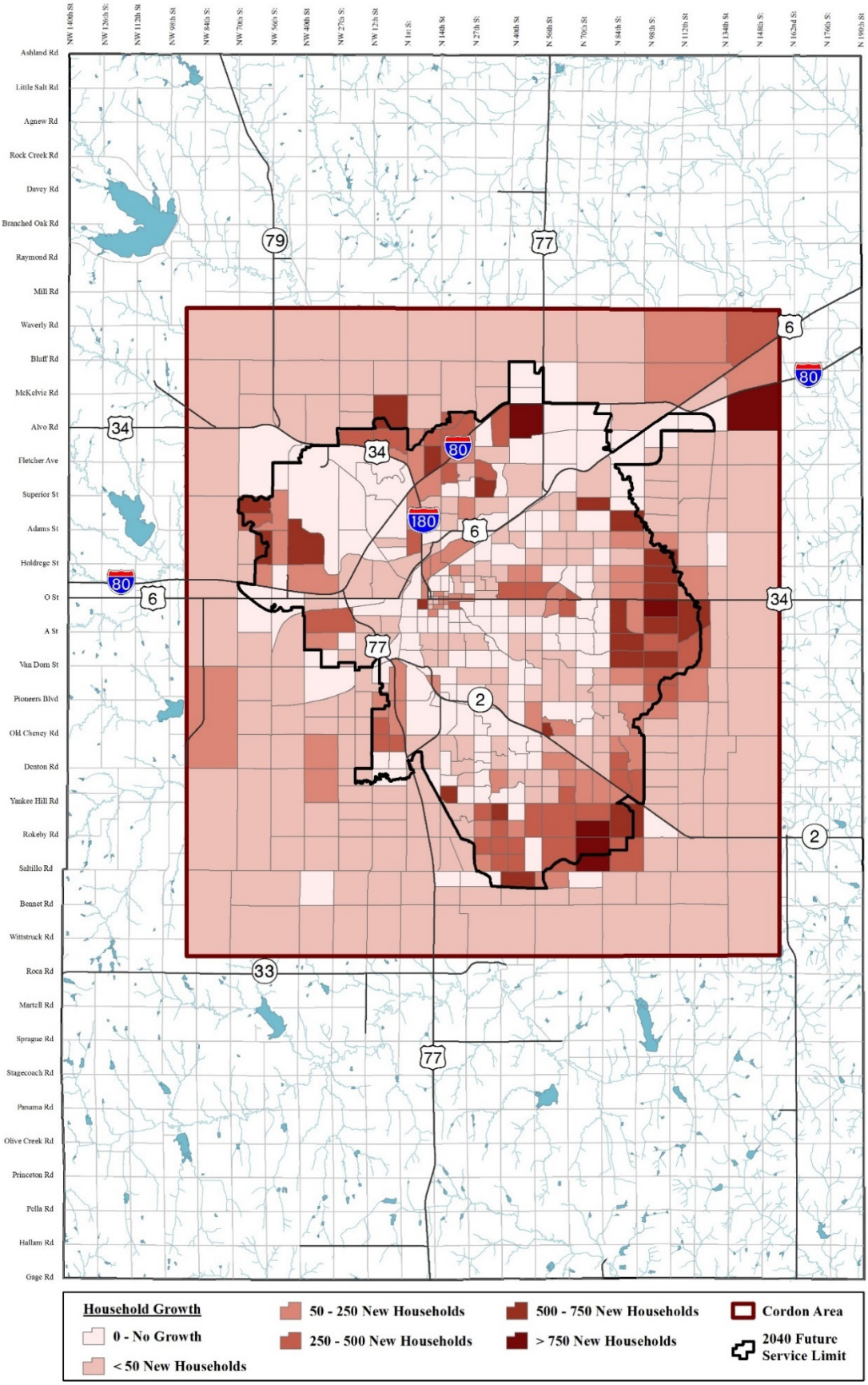


Figure 3. Household Growth

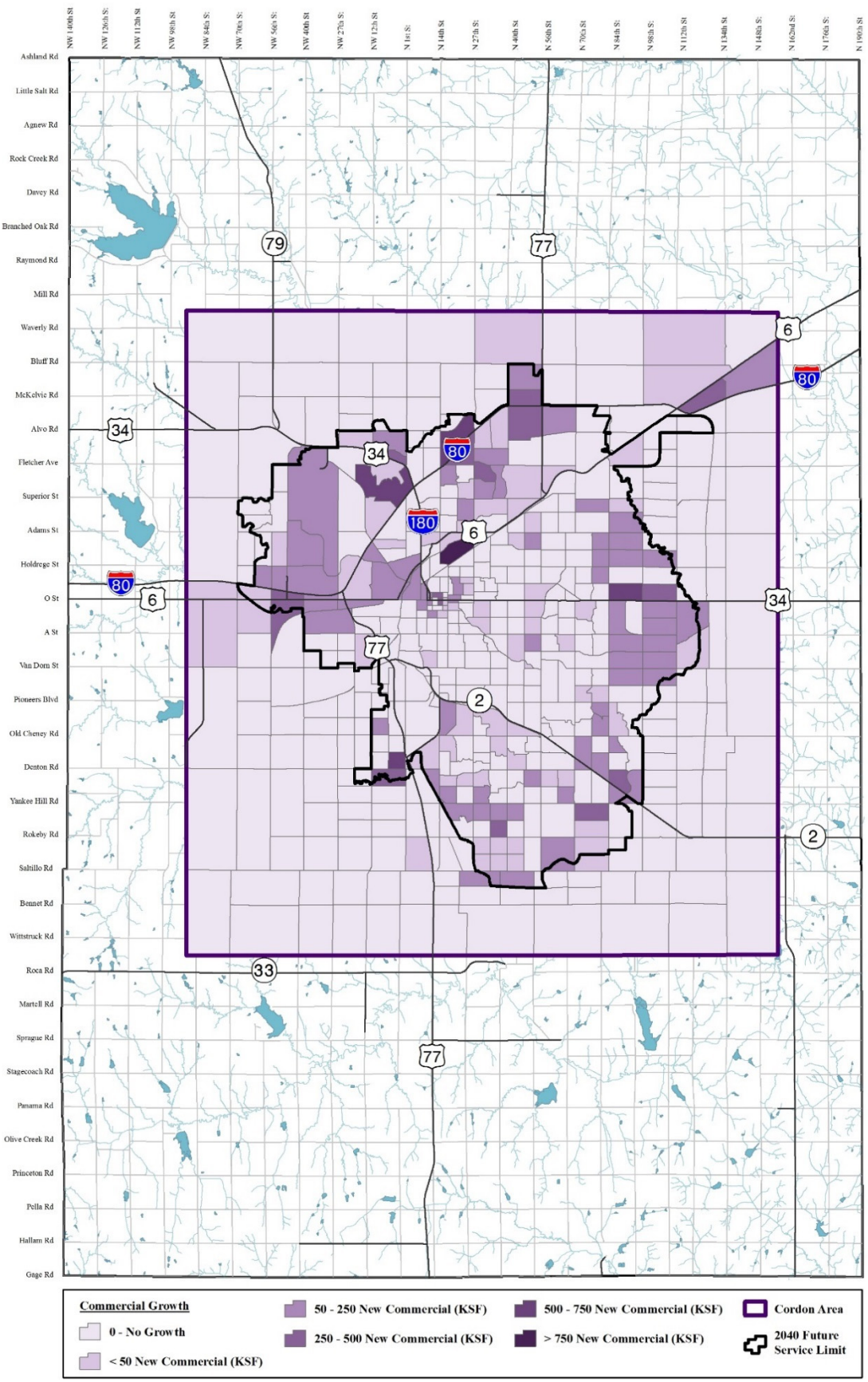


Figure 4. Commercial Growth

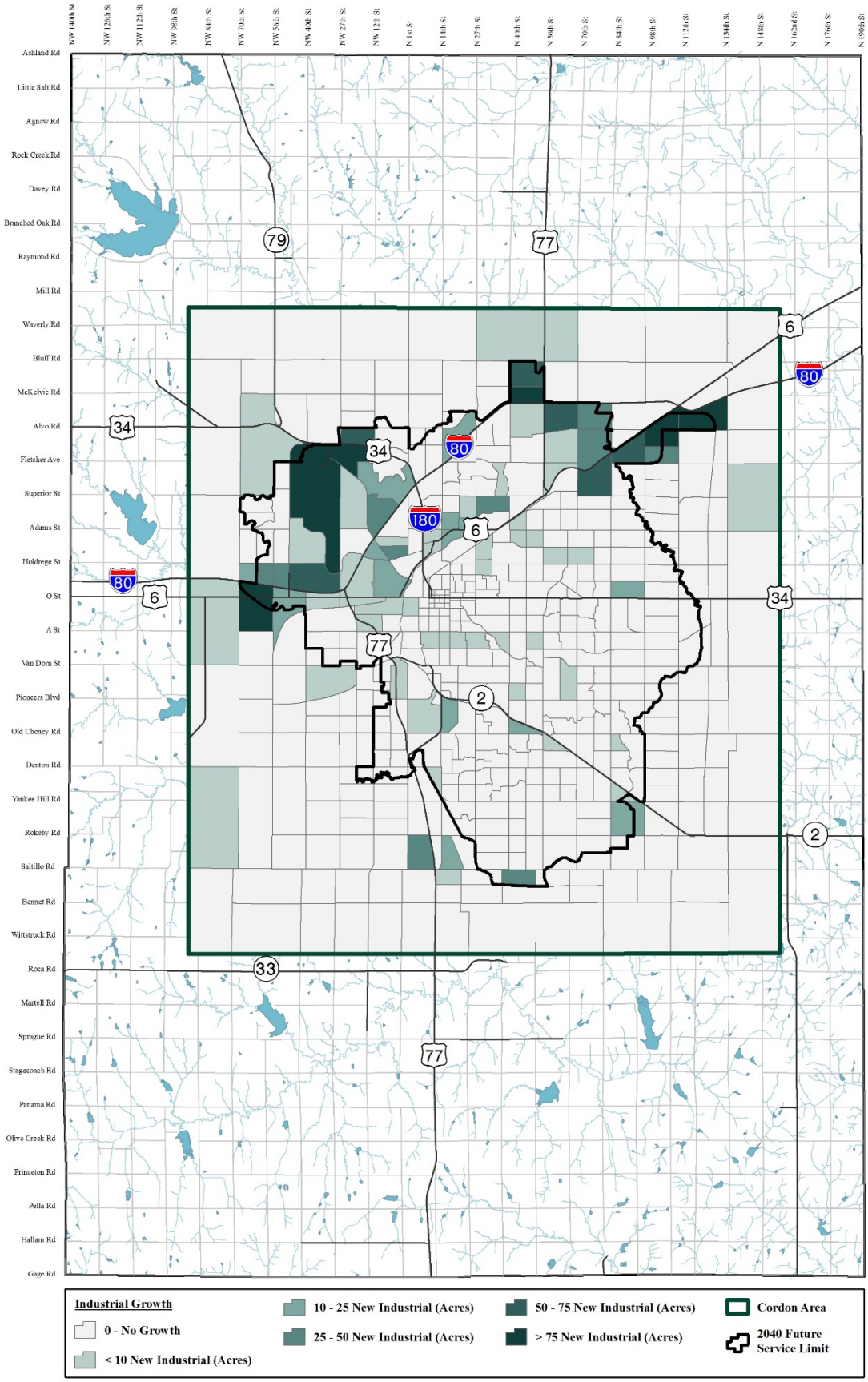


Figure 5. Industrial Growth

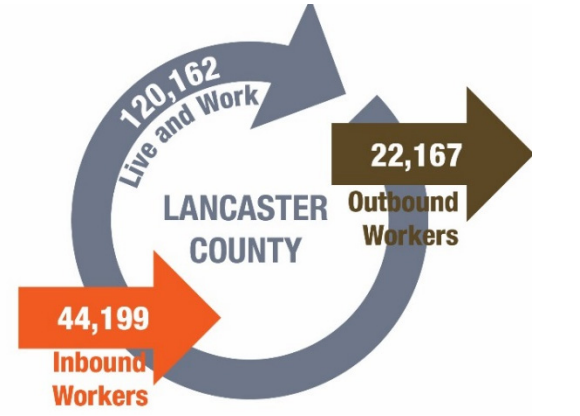
Travel Patterns and Trends

The following information provides an overview of transportation and commuting patterns in Lincoln and Lancaster County.

Commuting Patterns

Each day, more than 44,000 people travel to Lancaster County for work, while approximately 22,000 Lancaster County residents leave to work elsewhere (as shown on **Figure 6**). Another 120,000 County residents work within Lancaster County. That is, there is a net inflow of workers into the County, and around 84 percent of employed Lincoln/Lancaster County residents work in the County.

Figure 6. Workflows



SOURCE: US CENSUS LONGITUDINAL EMPLOYER-HOUSEHOLD DYNAMICS (LEHD) FOR LANCASTER COUNTY, 2013.

The average travel time to work for Lincoln residents is 18.1 minutes (18.4 minutes for all of Lancaster County)[1]. As shown in **Table 2**, 80 percent of Lancaster County residents can arrive at their place of work in less than 25 minutes. An additional 13 percent of residents can arrive to work in 25 to 34 minutes. The remaining residents travel more than 35 minutes to work, with 3 percent of trips taking more than an hour. These travel times have remained quite consistent since 2006.

Table 2. Travel Time to Work

Time	Share
Less than 5 minutes	3%
5 to 9 minutes	13%
10 to 14 minutes	21%
15 to 19 minutes	23%
20 to 24 minutes	18%
25 to 29 minutes	5%
30 to 34 minutes	8%
35 to 39 minutes	1%
40 to 44 minutes	1%
45 to 59 minutes	3%
60 or more minutes	3%

SOURCE: US CENSUS LONGITUDINAL EMPLOYER-HOUSEHOLD DYNAMICS (LEHD) FOR LANCASTER COUNTY, 2013.

Another informative transportation metric is the distance and direction between home and work locations. In 2013, more than 79 percent of workers living in Lancaster County traveled less than 10 miles from their homes to their work locations. A sizeable number, 13.3 percent, of workers travel 25 miles or more to get to work. **Table 3** shows the breakdown of commute travel by miles.

Table 3. Distance from Home to Work

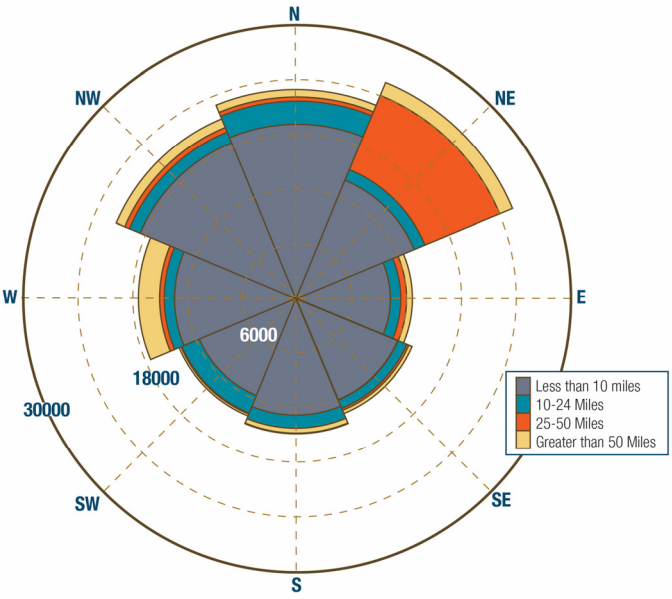
Distance	Count	Share
Less than 10 miles	112,631	79.1%
10 to 24 miles	10,680	7.5%
25 to 50 miles	11,712	8.2%
Greater than 50 miles	7,306	5.1%
Total Jobs	**142,329**	**100.0%**

SOURCE: US CENSUS LONGITUDINAL EMPLOYER-HOUSEHOLD DYNAMICS (LEHD) FOR LANCASTER COUNTY, 2013.

[1] American Community Survey (ACS) 5-year estimate for 2010–2014.

Most employees traveling between 25 and 50 miles are traveling in a northeastern direction, toward Omaha. **Figure 7** shows the total distance and direction of travel.

Figure 7. Distance and Direction from Home to Work



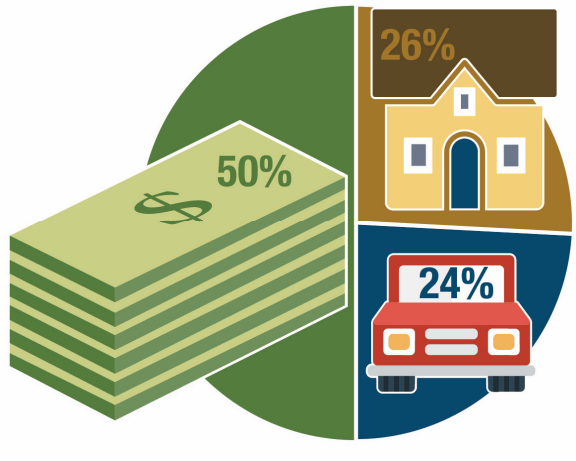
SOURCE: US CENSUS LONGITUDINAL EMPLOYER-HOUSEHOLD DYNAMICS (LEHD) FOR LANCASTER COUNTY, 2013.

Housing and Transportation Affordability

Housing is typically considered affordable when consuming less than 30 percent of a household's income. The Housing and Transportation (H+T) index expands this traditional measure to include transportation costs, usually a household's second-largest expense. By considering the combined costs of housing and transportation associated with the location of the home, the H+T index provides a more complete understanding of affordability and shows that location-efficient places can be more livable and affordable.

The typical household's housing expense in Lancaster County accounts for 26 percent of the total average income, while transportation expenses account for 24 percent. Combined, the cost of housing and transportation in Lancaster County is 50 percent of the average household income (**Figure 8)**, which is higher than the Center for Neighborhood Technology (CNT) benchmark of 45 percent.

Figure 8. Housing + Transportation Index



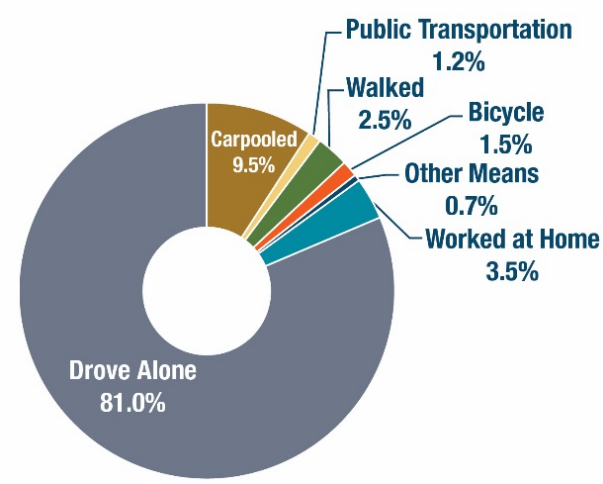
SOURCE: CENTER FOR NEIGHBORHOOD TECHNOLOGY; AVERAGE HOUSING AND TRANSPORTATION COSTS AS A PERCENT OF TOTAL HOUSEHOLD INCOME FOR LANCASTER COUNTY, BASED ON 2013 AMERICAN COMMUNITY SURVEY 5-YEAR ESTIMATES.

The H+T index demonstrates that location-efficient neighborhoods—compact, mixed use communities with a balance of housing, jobs, and stores and easy access to transit—have lower transportation costs because they enable residents to meet daily needs with fewer cars, the single biggest transportation cost factor for most households. The way in which many cities have grown in the last half century has impacted American families. Families who buy homes farther from jobs often pay more in higher transportation costs. These same families are most sensitive to gas price increases because they drive longer distances. And the longer distances associated with outward growth mean more congestion on city streets, more time commuting, and higher greenhouse gas emissions.

Mode Split

The American Community Survey (ACS) asks respondents to identify their primary means of transportation to work. Driving alone is by far the most commonly used mode of transportation for Lancaster County. Over four out of five residents drive alone in their vehicles to work. **Figure 9** shows the percentage of workers who use each travel mode to travel to and from work.

Figure 9. Commuter Mode Split



SOURCE: 2014 AMERICAN COMMUNITY SURVEY (ACS) 5-YEAR ESTIMATE FOR LANCASTER COUNTY.

Zero Vehicle Households

Although most workers in Lancaster County travel alone in a vehicle, there are 7,614 households (6.5 percent) without access to a vehicle[2]. These households have an increased need for transit service and multimodal facilities. **Figure 10** shows the geographic distribution of zero vehicle households. There is a higher concentration of zero vehicle households (darker blue shading) in the downtown area where alternative transportation modes are more prevalent. However, sizable numbers of zero-vehicle households are sprinkled throughout the area.

[2] Source: 2014 ACS 5-year estimate for Lancaster County.

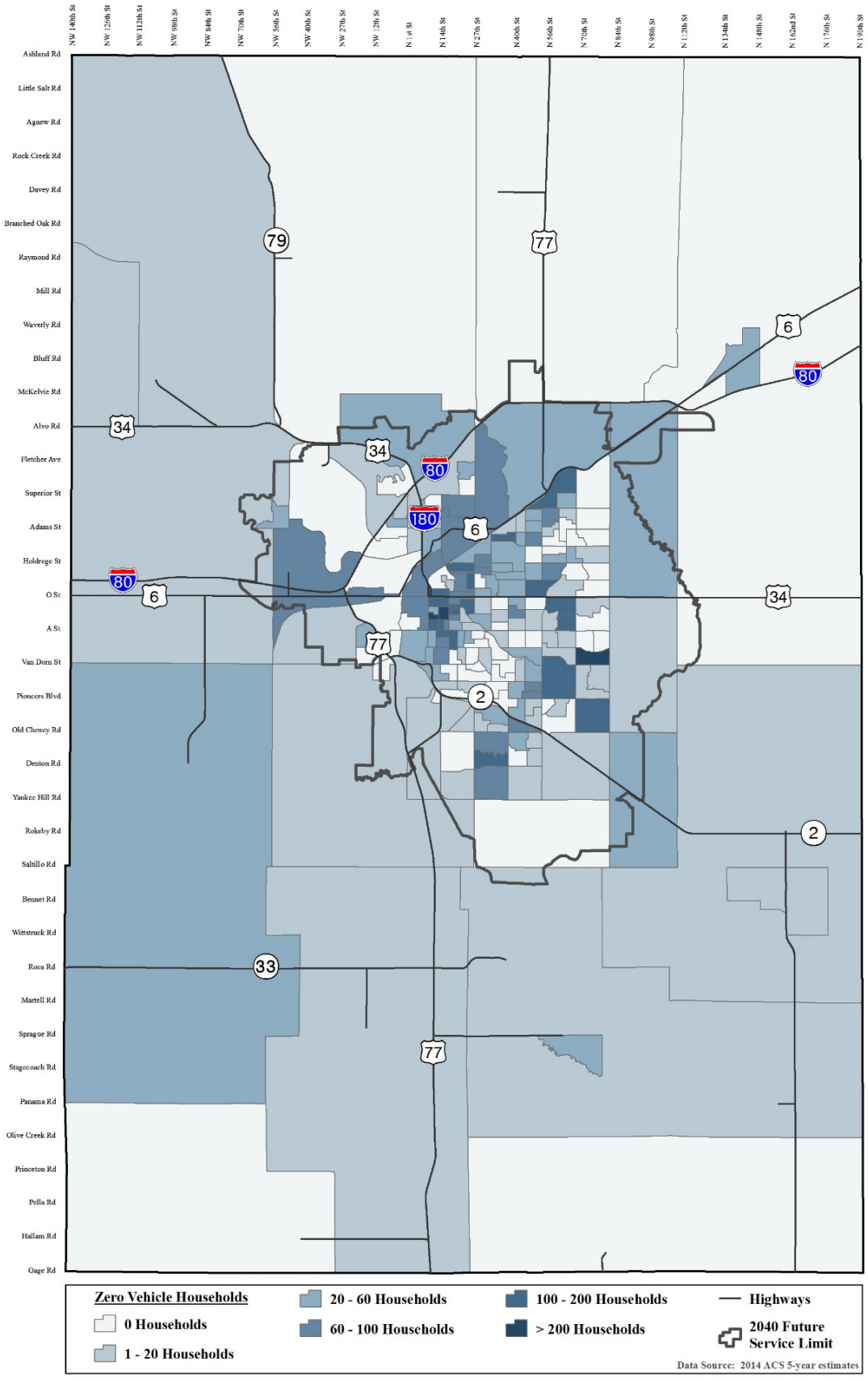


Figure 10. Zero Vehicle Households

Roads and Bridges

City, county, state, and federal roads and highways provide the majority of travel within the region. They also serve as the infrastructure for transit service, typically include sidewalks for pedestrians, and increasingly accommodate bicyclists on dedicated bike lanes or designated bike routes. The following sections provide a snapshot of the current and future state of the region's road and bridge conditions, the functionality, and the travel demand on the street network.

Surface Conditions

Every three to four years, the City of Lincoln monitors the pavement condition of the major street system, and about every ten years, the City conducts a full survey of all public streets. To conduct a pavement condition survey, a specially equipped van collects high-quality digital images of the pavement surface and measures the number and extent of defects. The van also records the extent of roughness and rutting along each street surface. The van is equipped with navigation and global positioning systems (GPS) to map each surveyed street section. Once all of the digital images are processed for each pavement section in the street network, the information is entered into a pavement management software program designed for the City of Lincoln's unique combination of traffic, climate, and paving materials.

Measurable improvements in the condition scores have been seen following recent one-time funding increases for arterials in 2012 (ARRA funding) and 2015 (Antelope Valley) and for residential in 2014 (increased gas tax collections). The City invested over $10 million in street rehabilitation in 2016, allowing for rehabilitation of 18.9 miles of arterial streets and 80 blocks of residential streets. The 2016 increase in rehabilitation funding has had a noticeable positive impact on the pavement condition, particularly on arterial streets.

Bridge Conditions

The City of Lincoln Public Works Department maintains a database of bridge conditions that is updated as bridges are rehabilitated and/or replaced. Bridges are inspected annually. A bridge's sufficiency rating is a measure of its condition and ability to serve its intended function. Sufficiency ratings range from 0 to 100, with 100 being the best. A low sufficiency rating may be due to structural defects, narrow lanes, low vertical clearance, or other factors that make it functionally obsolete. Bridges with ratings between 50 and 80 are eligible for rehabilitation, and bridges with ratings below 50 are eligible for replacement. As shown on **Figure 11** and summarized in **Table 4**, the City of Lincoln maintains 135 vehicle bridges (with an average sufficiency rating of 84.3), and Lancaster County maintains 184 bridges (with an average sufficiency rating of 75.2).

Table 4. Bridge Sufficiency Ratings

Bridge Sufficiency Rating	City Maintained Bridges	County Maintained Bridges
> 80	104	77
50 – 80	25	84
< 50	6	23
Total	**135**	**184**

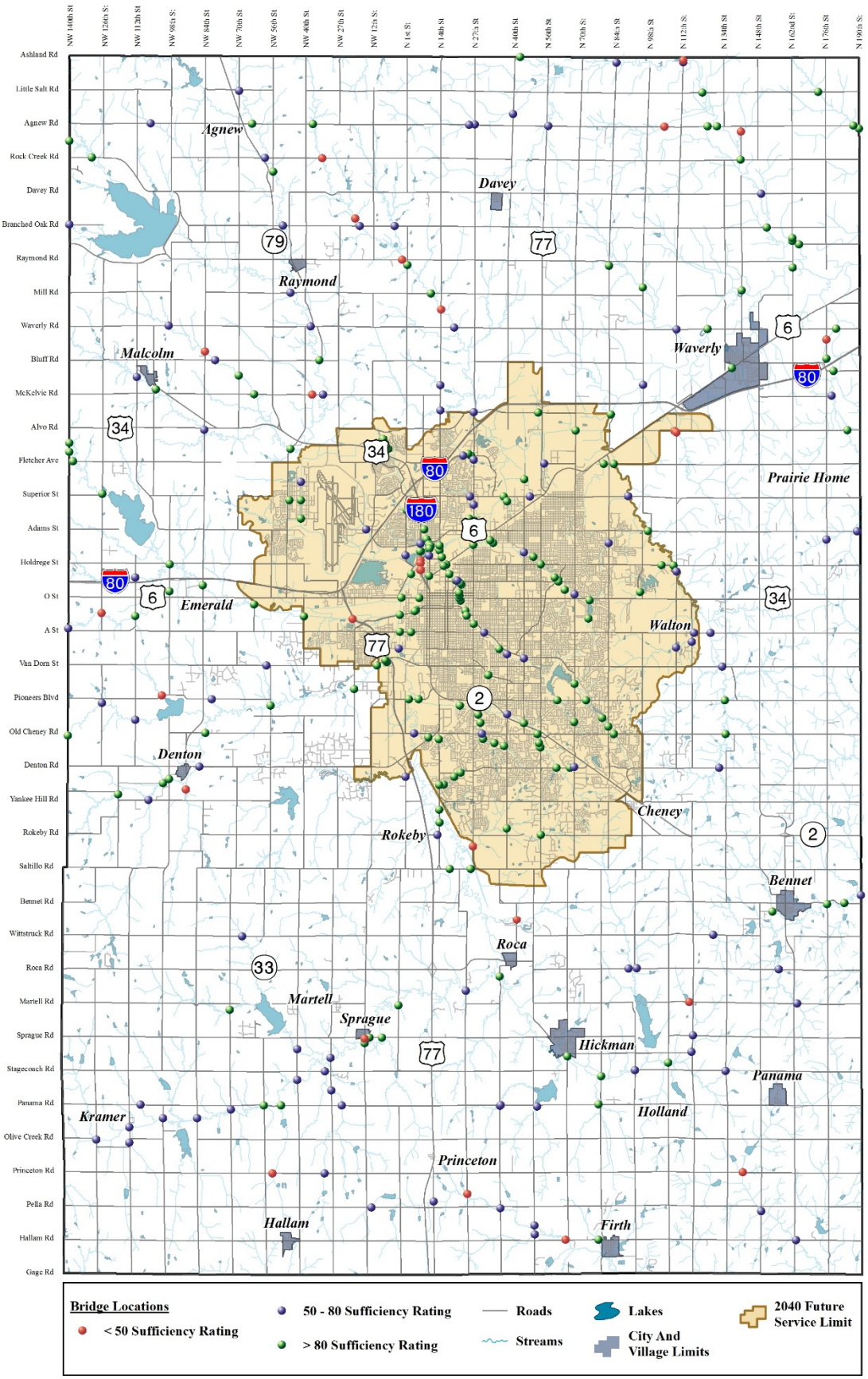


Figure 11. Bridge Sufficiency Ratings

National Highway System

The US Department of Transportation (USDOT), in cooperation with the states, local officials, and MPOs, developed the National Highway System (NHS) to identify the core road network considered critical to the nation's economy, defense, and mobility. The US Congress approved the NHS in 1995, with the intent that the United States would prioritize federal-aid funds appropriately to ensure that the NHS was adequately maintained. **Figure 12** shows the NHS routes in the Lincoln-Lancaster County region.

Functional Classification

The street network in Lincoln and Lancaster County includes roads ranging from local streets that provide residences and businesses direct access to Interstate 80 (I-80), as shown on **Figure 13.** **Figure 14** shows the number of through lanes.

Streets generally provide two important functions: mobility and land access. These functions conflict with each other—more land access generally leads to reduced traffic carrying capacity and mobility, and vice versa. Each roadway type is specifically designed to operate with certain characteristics based on the adjoining land uses, level of continuity, and proximity and connections to other facilities. A street's functional classification describes these characteristics.

Interstate and Expressway: These are divided, limited access facilities with no direct land access. The freeway does not have at-grade crossings or intersections. The expressway is similar to a freeway except that it may have cross streets that intersect at-grade and access is either fully or partially controlled. Both the freeway and expressway are intended to provide the highest degree of mobility serving potentially larger traffic volumes and long trip lengths.

Principal Arterials: This functional class of street serves the major portion of inter-community and intra-community traffic movement within the urban area and is designed to carry high traffic volumes. Facilities within this classification can provide direct access to adjacent land, but such access is incidental to the primary functional responsibility of moving traffic within the system.

Minor Arterials: This functional class serves trips of moderate length and offers a lower level of mobility than principal arterials. This class interconnects with and augments principal arterials, distributes traffic to smaller areas, and provides some direct land access. Minor arterial streets are designed to carry moderate to heavy traffic volumes.

Collector Streets: These streets serve as a link between local streets and the arterial system. Collectors provide both access and traffic circulation within residential, commercial, and industrial areas. Collector streets also provide more direct routes through neighborhoods for use by transit, pedestrians, and bicyclists.

Local Streets: These streets serve as conduits between abutting properties and streets of higher functional classification. Local streets provide the lowest level of mobility and are generally designed to carry low levels of traffic.

Current and Future Traffic and Congestion

Current Traffic

The City of Lincoln conducted an extensive traffic count program in 2015, with 469 count locations throughout the City. These counts, along with 18 County traffic counts and 64 NDOR traffic counts within the model area, were used to assess the current conditions and as a means to calibrate the travel demand model. **Figure 15** depicts the current daily traffic volumes using bandwidths.

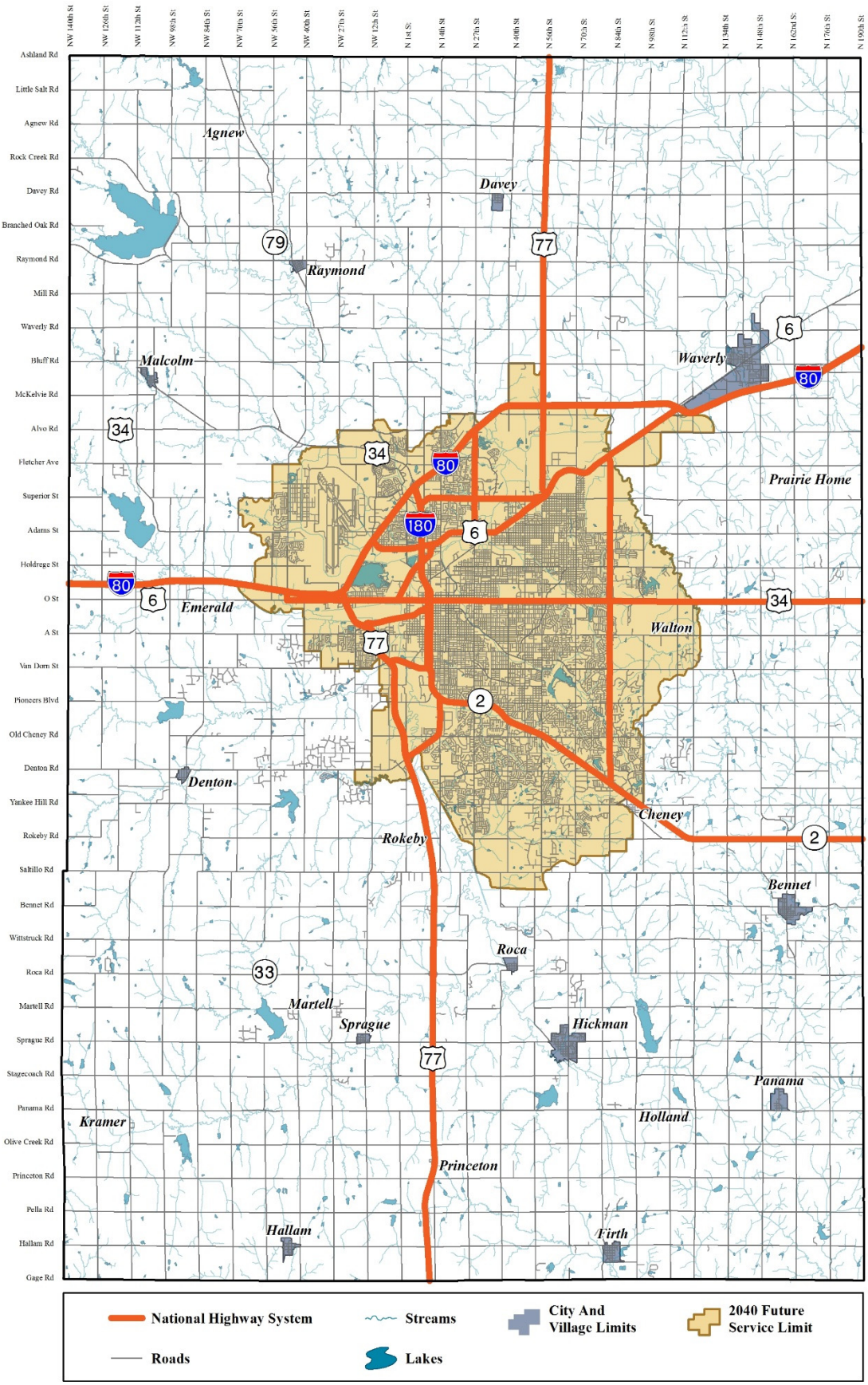


Figure 12. National Highway System

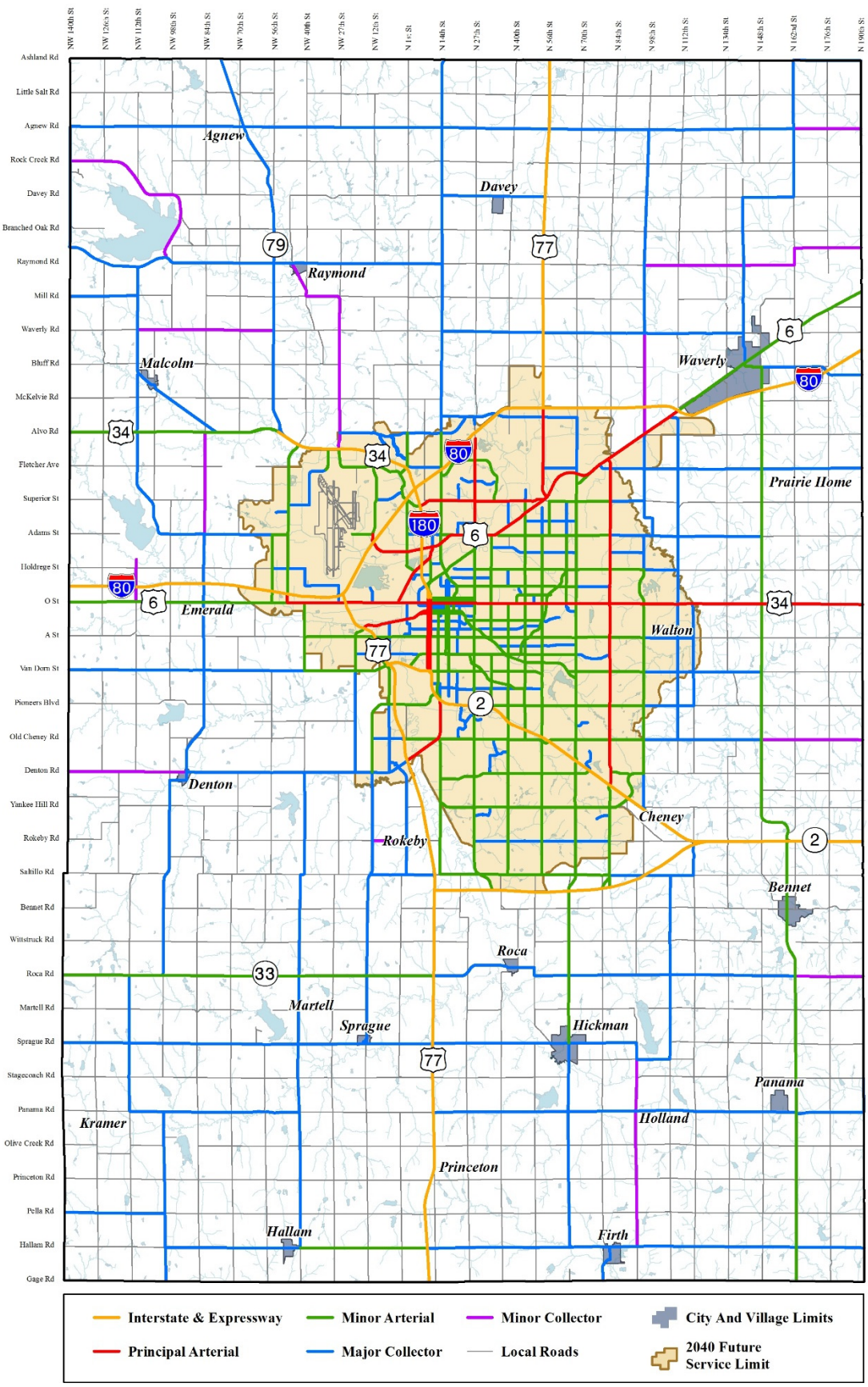


Figure 13. Existing Functional Classification

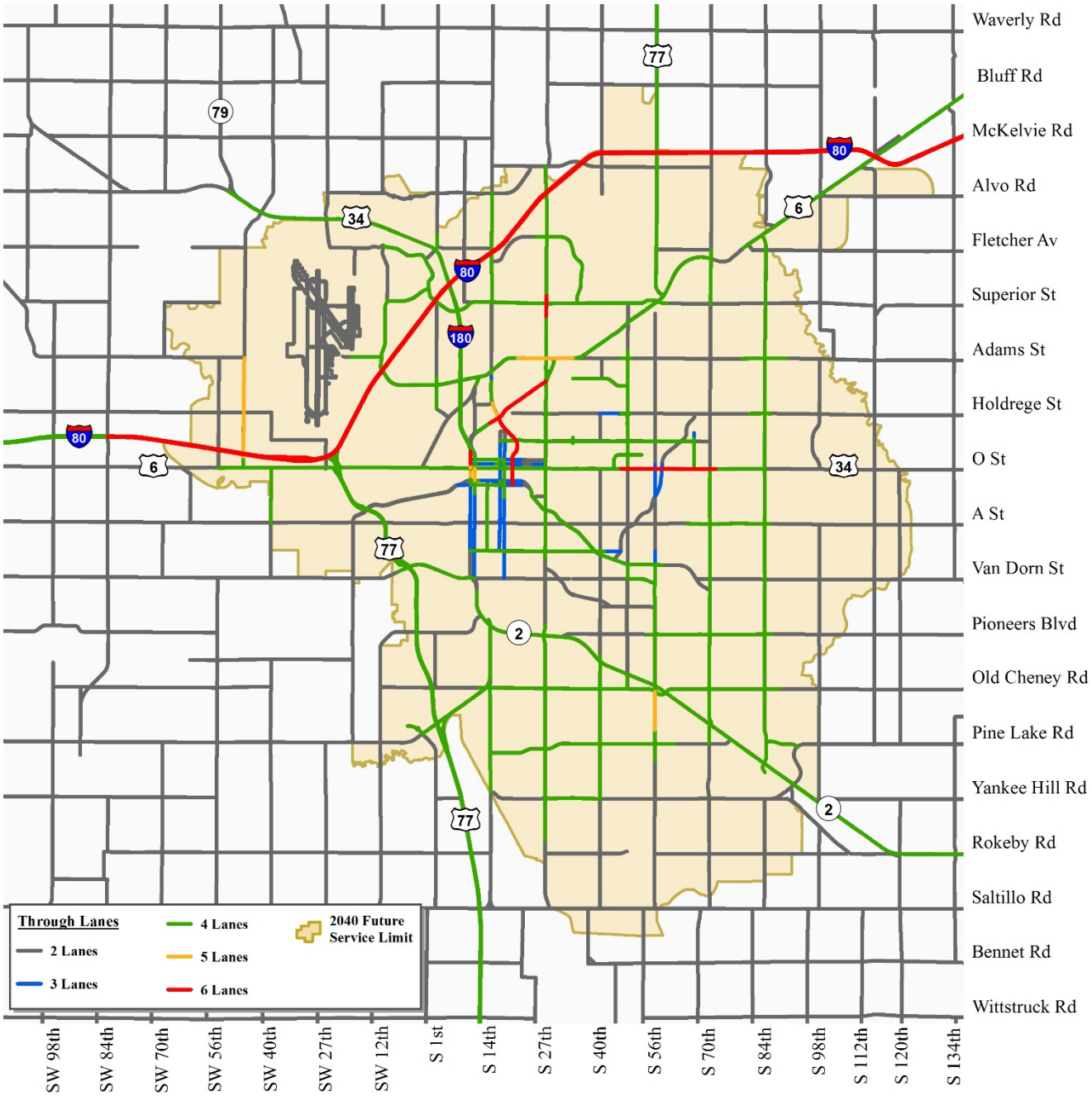


Figure 14. Existing Through Lanes

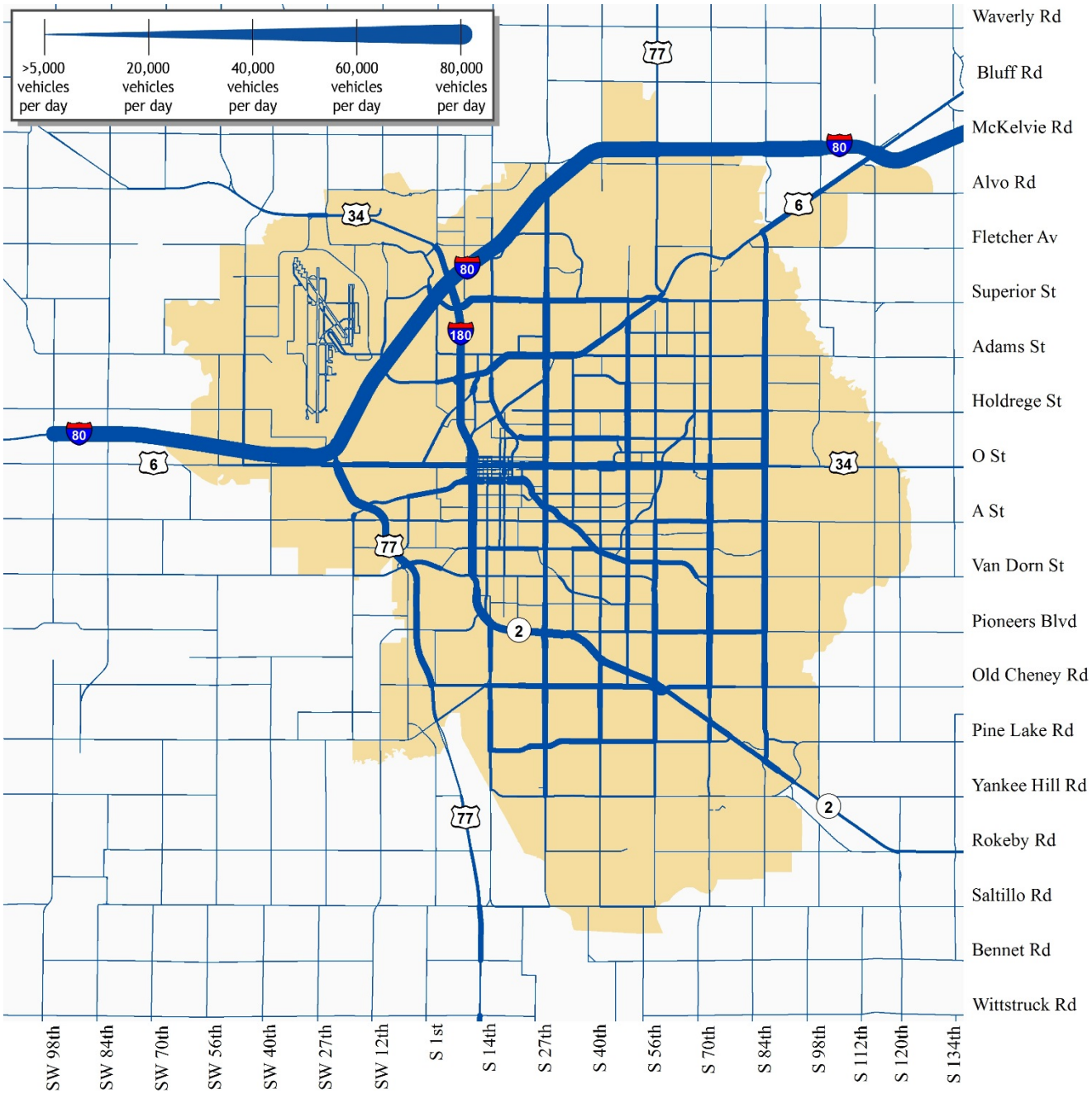


Figure 15. Current Daily Traffic Volumes

Comparing current daily traffic volumes with planning level capacities (volume to capacity [V/C] ratio) can help to identify levels of congestion on the roadway network. The planning level capacities used for this analysis vary depending on the street's functional classification, the area type, and the number of through lanes, as shown on **Table 5**. Because the V/C analysis uses planning-level capacities and daily traffic volumes, it does not explicitly account for delays or congestion that may be experienced at a particular intersection. This analysis provides a high-level snapshot of the current congestion. As depicted on **Figure 16**, the City of Lincoln currently has relatively free-flow conditions. Currently, congestion in Lincoln typically occurs at spot locations for a short duration (15 to 30 minutes) of the peak hour, or as a result of train delays, which are not accounted for in this analysis.

Future Travel Demands

As described in the **Land Use and Demographics** section, the future travel demand patterns in Lincoln are primarily a function of the household and employment growth in the area and of the future roadway network. To begin understanding the future needs of the roadway network, future year models (2026 and 2040) were developed using the Existing + Committed (E+C) roadway network—that is, the existing network plus those improvement projects with committed funding to begin construction over the next six years. **Table 6** lists projects included in the E+C networks. The South and West Beltways are included in the E+C networks to aid in prioritizing and programming alternative system improvements.

Table 5. Planning Level Daily Capacities (per Through Lane)

Functional Classification	Central Business District (CBD)	Urban	Suburban	Rural
Freeway	20,000	20,000	20,000	19,000
Expressway	11,000	12,000	12,000	12,000
Principal Arterial	9,300	10,800	11,200	11,200
Minor Arterial	7,400	8,600	9,000	9,000
Urban Collector	5,600	7,100	7,400	7,400
Major Rural Collector (State)	5,600	7,100	7,400	7,400
Major Rural Collector (County)	5,600	7,100	7,400	7,400
Minor Rural Collector	5,600	7,100	7,400	7,400
Others (Local)	5,200	6,600	6,900	6,900
Ramp	7,400	8,600	9,000	9,000
Freeway Ramp	9,300	10,800	11,200	11,200

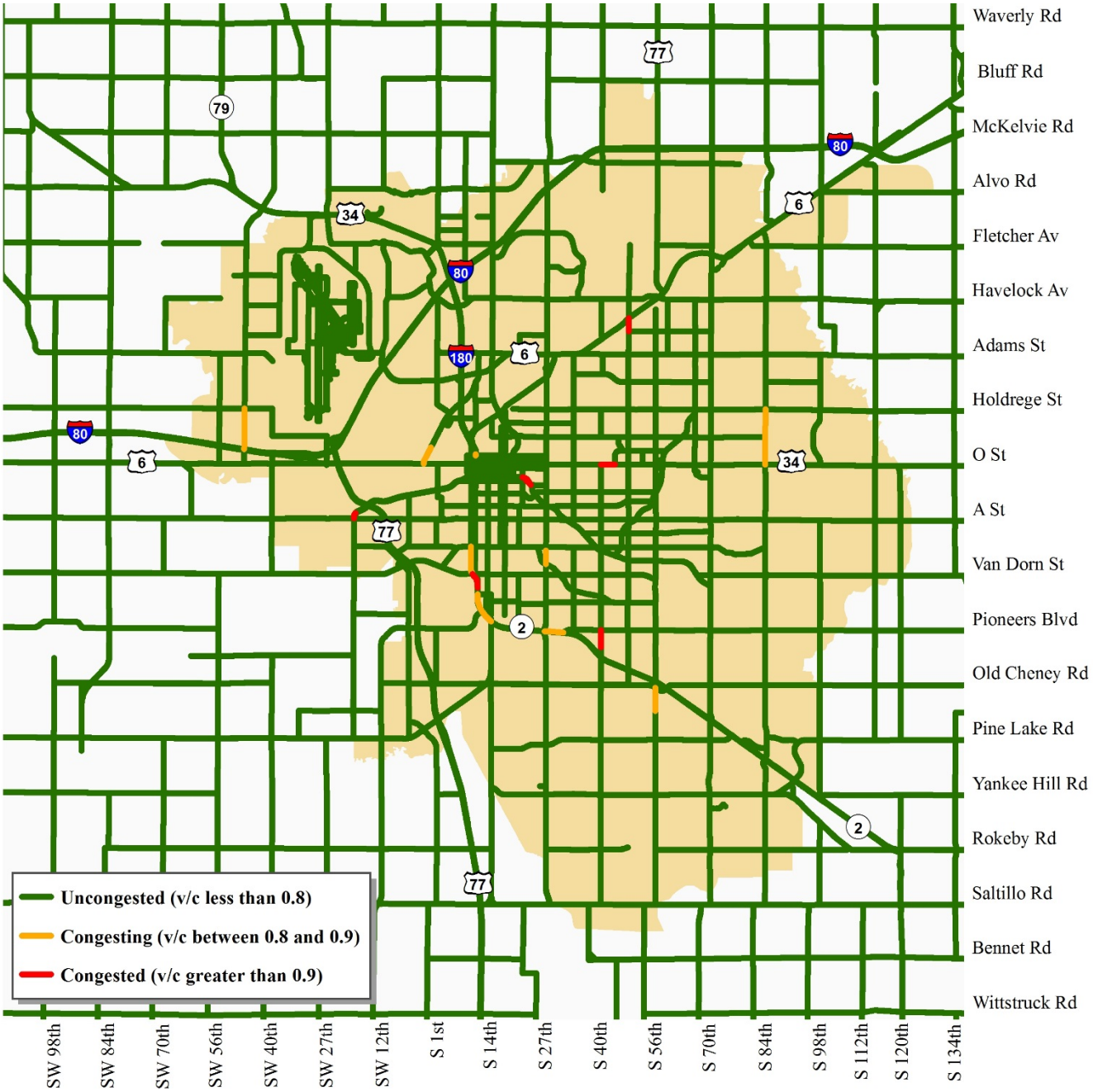


Figure 16. Current Congestion Levels

Table 6. Committed Projects

Roadway	Segment
Pine Lake Road widening	61st Street to Hwy 2
Yankee Hill Road urban cross-section	70th Street to Hwy 2
West "A" Street widening (2+1)	SW 40th Street to Folsom Street
North 10th Street & Military bridge rehab/replace	Over Salt Creek from Military Road to US 6
14th/Warlick intersection reconstruction	At Old Cheney Road
Rokeby Road	70th Street to 98th Street
South Beltway	US 77 to Hwy 2
West Beltway (US 77) improvements	I-80 to South Beltway

Figure 17 and Figure 18 present the daily travel demand forecasts for 2026 and 2040, respectively. These forecasts have been calibrated using existing traffic counts. **Appendix D** includes documentation of the travel demand model update process, including the calibration and validation.

The 2026 and 2040 traffic volume forecasts were compared with the planning-level capacities of each roadway segment to understand the future locations of congestion, as shown on **Figure 19 and Figure 20**, respectively. The V/C ratios use the fully calibrated traffic volumes and the capacities associated with the E+C network for each future year. **Table 7** summarizes the congestion levels over time. The miles in each congestion level are centerline-miles within the Lincoln City limits. With the committed projects in place, the congestion levels are expected to remain relatively low in the future; however, several corridors are expected to experience increased delays and congestion over time. All roads outside of the Lincoln City limits are expected to remain uncongested through 2040.

Table 7. Congestion Levels over Time

	Uncongested	Congesting	Congested
2015	325.1 miles (98.5%)	3.3 miles (1%)	1.6 miles (0.5%)
2026 E+C	317.7 miles (94.3%)	13.3 miles (3.9%)	6.0 miles (1.8%)
2040 E+C	298.1 miles (88.5%)	21.6 miles (6.4%)	17.3 miles (5.1%)

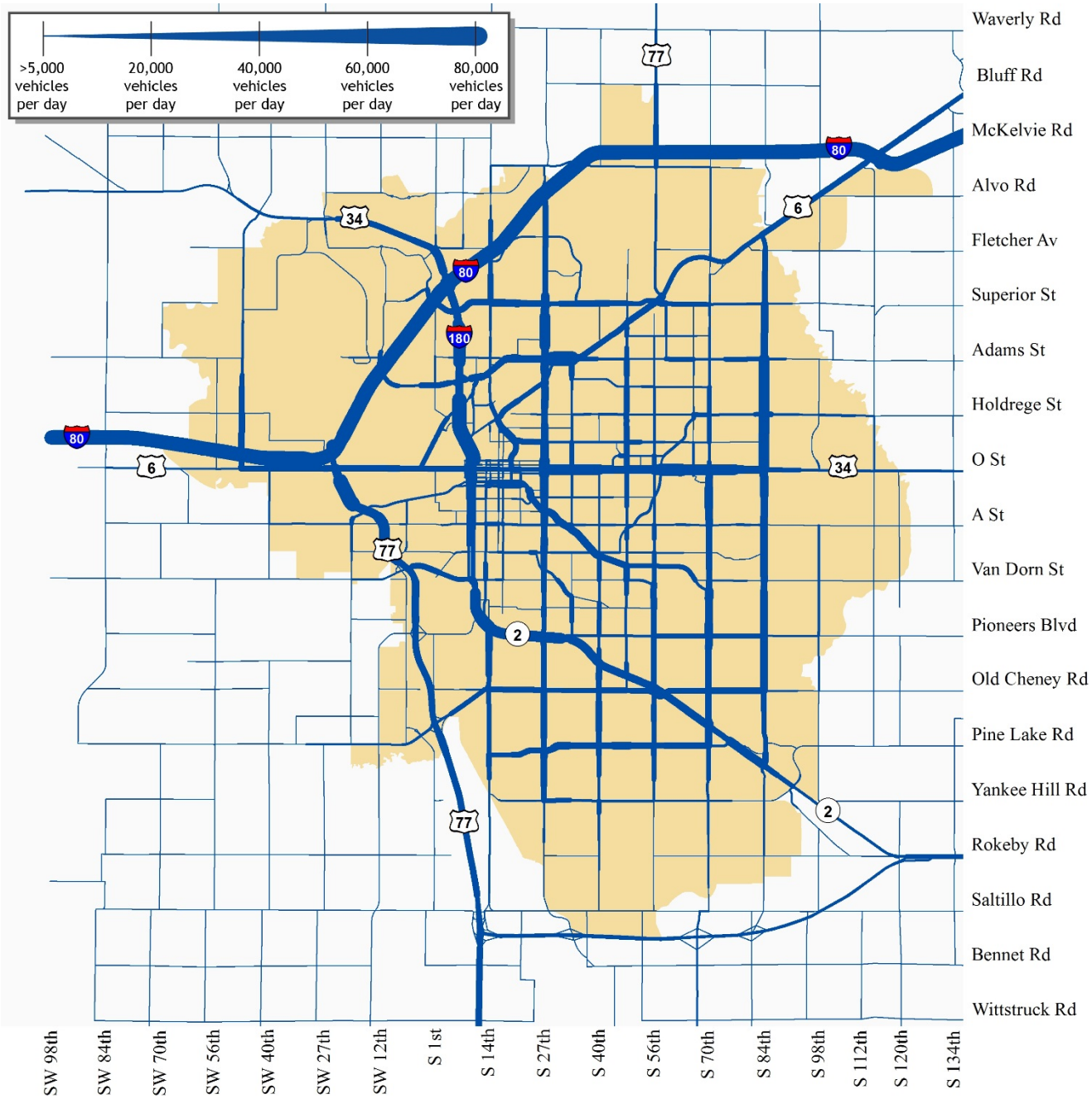


Figure 17. 2026 Daily Traffic Forecasts (E+C Network)

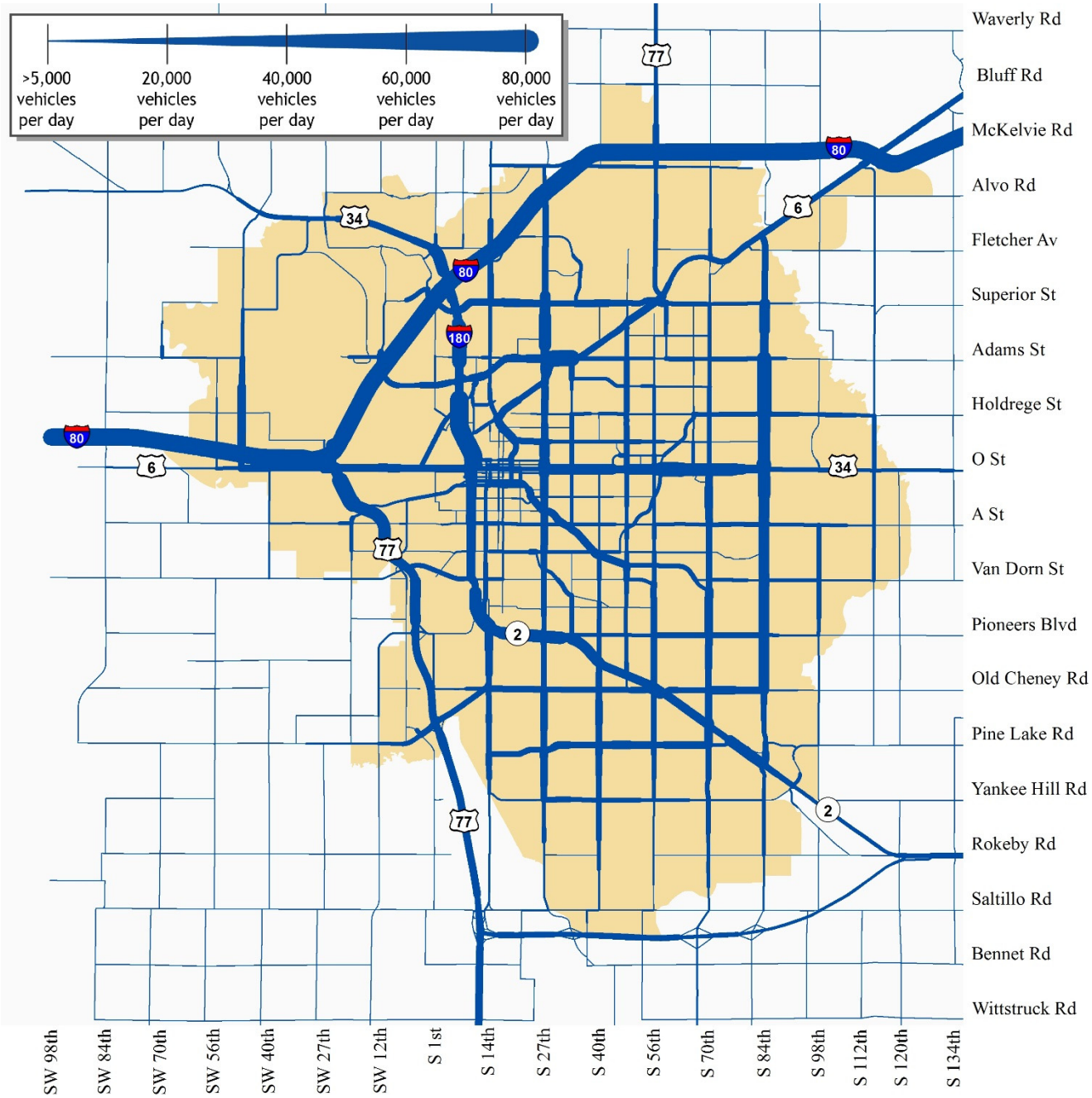


Figure 18. 2040 Daily Traffic Forecasts (E+C Network)

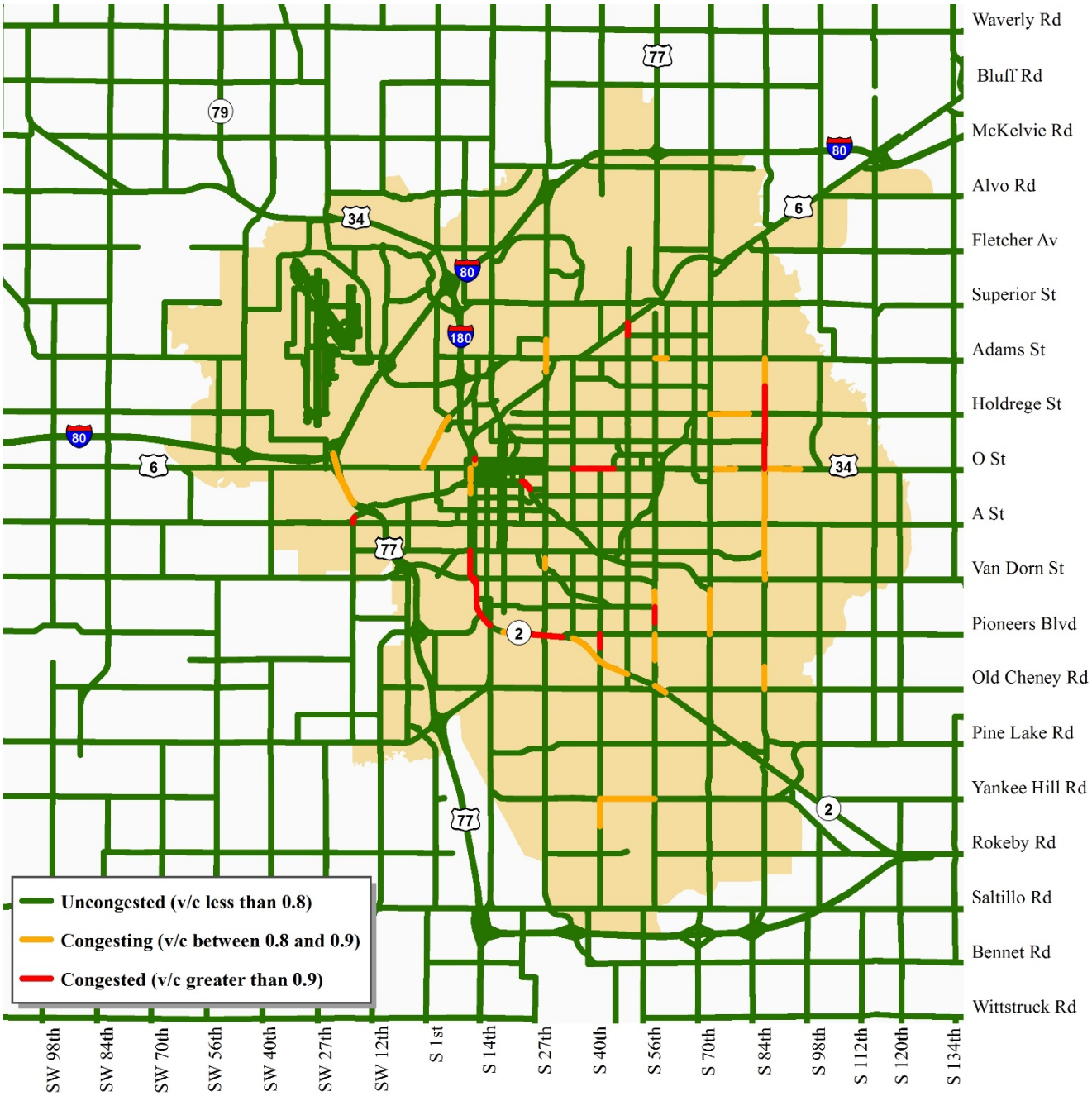


Figure 19. 2026 Congestion Levels (E+C Network)

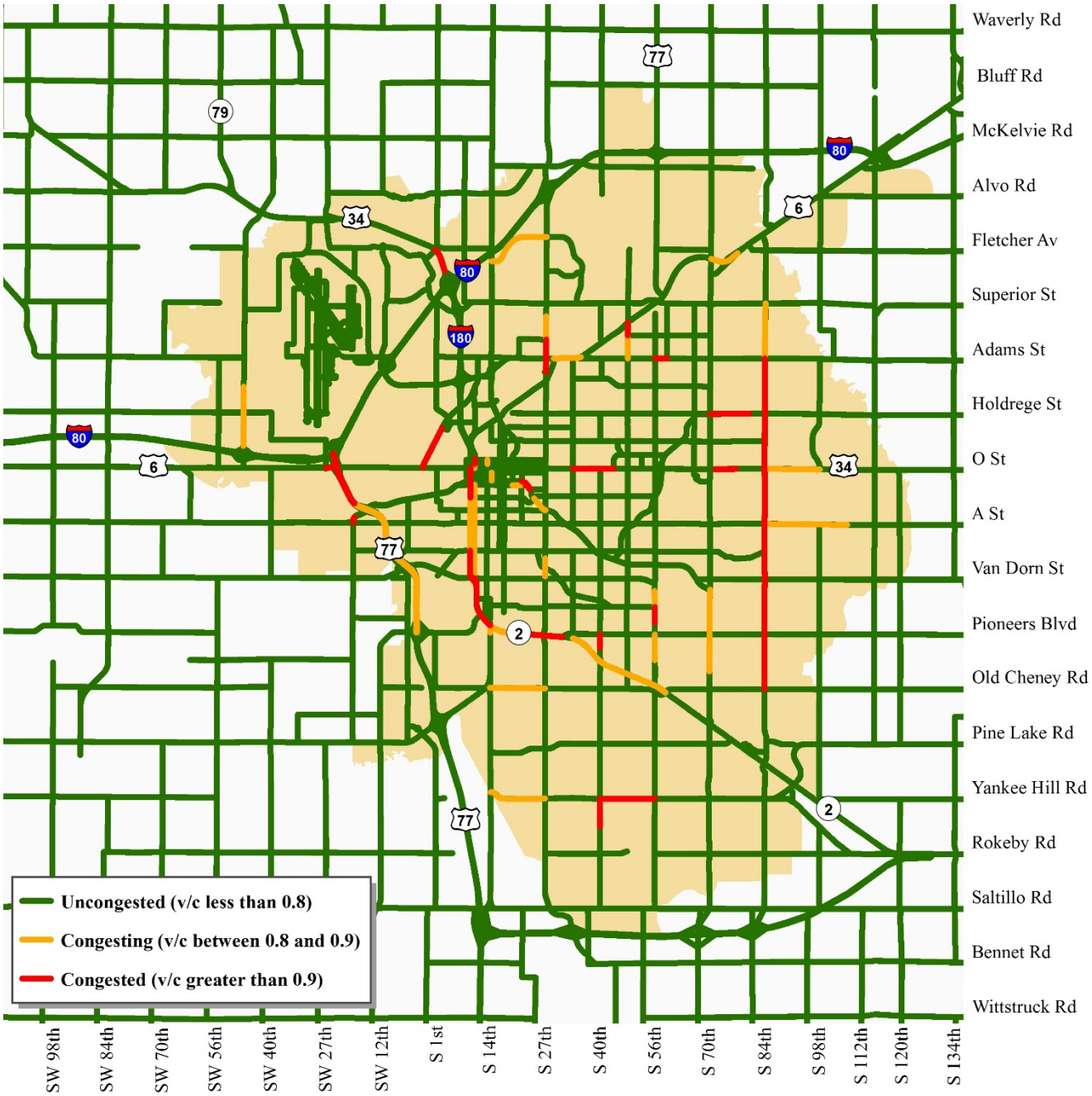
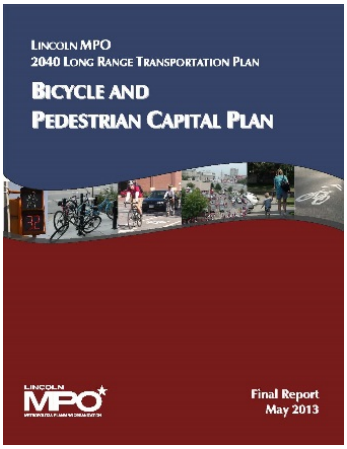


Figure 20. 2040 Congestion Levels (E+C Network)

Bicycle and Pedestrian



Completed May 2013, Lincoln MPO Bicycle and Pedestrian Capital Plan analyzes the existing bicycle and pedestrian system and examines the existing and future growth within the City and throughout the County to identify bicycle and pedestrian destinations. It also provides implementation strategies for prioritizing projects and implementing a successful plan. The Plan complements the community vision for a well-balanced transportation system.

The Bicycle and Pedestrian Capital Plan identifies strategies to develop a comprehensive bicycle and pedestrian network; to increase the use, safety, and convenience of bicycling and walking; and to promote bicycling and walking as integral components of the region's multimodal transportation system. The two main goals of the Plan include:

1. Provide and maintain a safe and an effective bicycle and pedestrian system that enables individual citizens of all ages and abilities to efficiently choose to bike or walk to a variety of destinations throughout the City as a means of travel, attaining health, and quality of life.
2. Fill in the missing bicycle and pedestrian segments and provide safe intersection crossings that connect residences and places of work, shopping, schools, transit, activity centers, and public activities so that people can reach destinations by walking or bicycling in addition to relying on personal vehicles.

The Plan addresses missing segments and deficiencies in the existing bicycle and pedestrian system. The Plan also includes a technical evaluation of work, shopping, business, and recreation destinations, and a short trips assignment to understand where bicyclists might ride and pedestrians might walk if facilities were available. The Plan incorporates a detailed assessment of pedestrian access to Lincoln's public schools.

Bicycle Facilities

As documented, Lancaster County has approximately 233 miles of existing bicycle facilities (trails, bike lanes, bike routes) as shown on **Figure 21**. The Plan notes that the system of bicycle trails, lanes, and routes provides the framework for a good bicycle system to serve the community. However, supplemental facilities will need to be developed to provide the opportunity for a comprehensive bicycle network, particularly in areas of new development and in areas where biking is more likely if a good network is available.

Many existing bicycle routes have been neglected and have missing signs and route designations. These facilities are in need of repair and require basic maintenance such as sweeping or removing tree overhangs. The lack of a maintained bicycle network limits bicycle mobility and travel.

There are also many areas of the City where bicycle routes are missing or begin and end erratically. These are often associated with new development. Many additional planned improvements have an unknown timeframe for completion.

Some existing facilities intersect with a higher volume arterial street with no traffic control, thereby making crossing the street challenging for bicyclists and deterring cyclists from using the system.

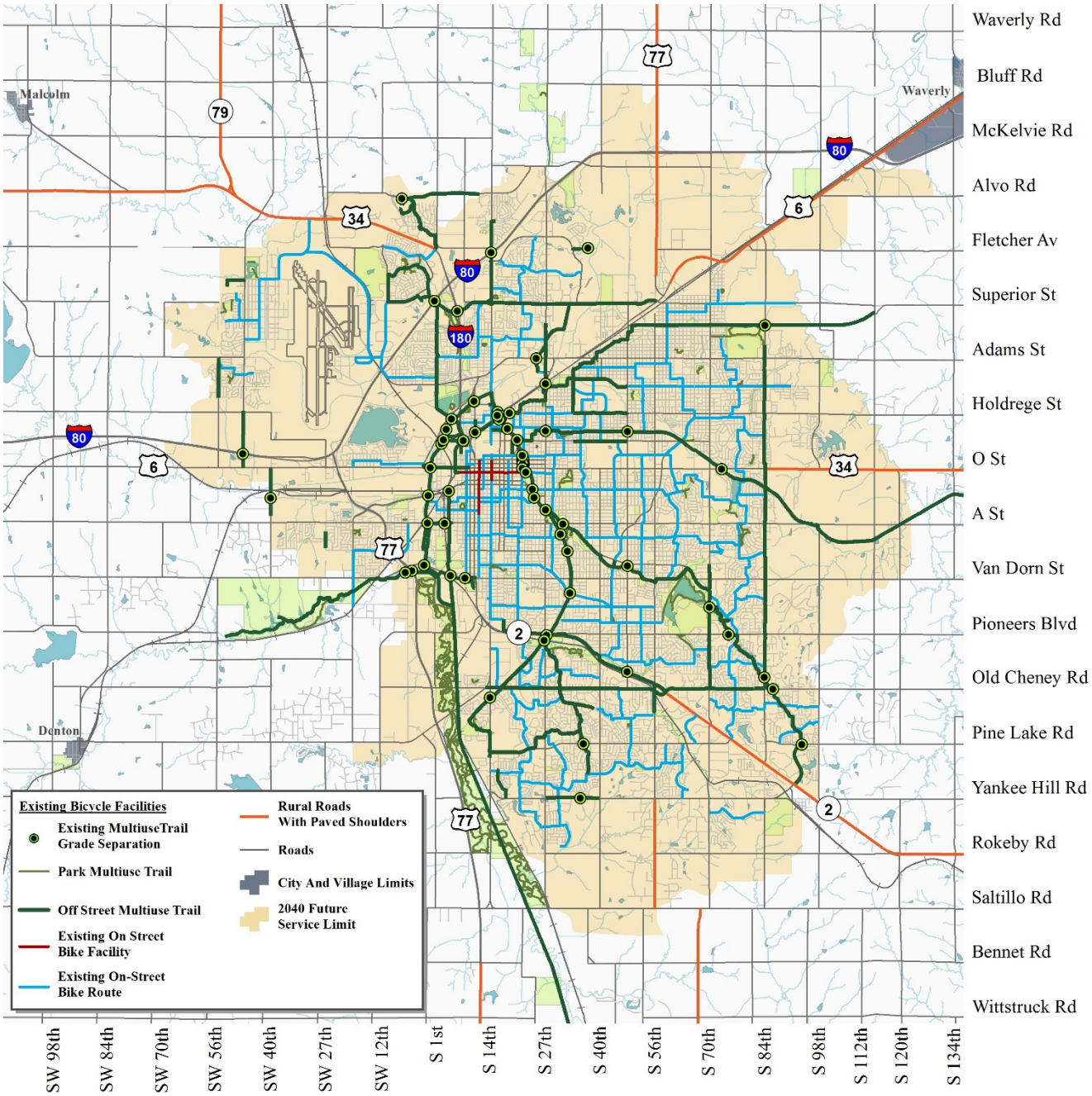


Figure 21. Existing Bicycle Facilities

The on-street bicycle network primarily serves the experienced commuter, not the less experienced rider or children. The existing trail system provides very good facilities for the recreational rider, but its direct access from many neighborhoods is limited. There is a need to expand the existing bicycle network with facilities that accommodate all types of users.

Using bike lanes on the arterial network has limited application because the arterial network within the City has narrow right-of-way (ROW) and multiple lanes with high speeds and traffic volumes. The exception is developing areas where the streets have not been completed to their ultimate condition.

On-street bicycle routes along residential streets and lower volume collector streets that are parallel to the arterial street system can effectively accommodate a broad range of bicyclists.

Off-street trails, such as recreational trails and shared use paths, have also been developed extensively in the City, taking advantage of abandoned railroad corridors and drainage ways. Because of the popularity and use of the trails, some 10-foot trails are reaching their capacity and potentially could be widened to 12 or 14 feet to accommodate the volume of users.

The N Street Cycle Track project includes the installation of a new two-way bikeway separate from traffic and pedestrians. The cycle track is on the south side of N Street from Pinnacle Bank Arena Drive to 23rd Street. The new cycle track connects the University of Nebraska-Lincoln (UNL) with existing bike lanes on 14th and 11th streets and to the trail system to the east and west of downtown. The project just opened in December 2015 and was recognized by People for Bikes as one of America's 10 best new bike lanes of 2015.[3]

The City of Lincoln will launch Phase 1 of the Lincoln bike sharing system in 2017, including 15 stations and 100 bikes. The City applied for, and was awarded, a Congestion Mitigation and Air Quality (CMAQ) grant for $600,000, which will be used for the new bike sharing system.

Pedestrian Facilities

In general, Lincoln has an excellent sidewalk network as depicted on **Figure 22**. Most homes and businesses are served by Lincoln's network of over 1,700 miles of sidewalks. Almost all neighborhood streets and arterials have sidewalks along both sides. For years, the City has required new development to include sidewalks on both sides of the street. The continuation of this requirement is important for future development areas.

However, sidewalks in many older areas of the City have developed cracks and heaving pavement and require maintenance, making it particularly difficult for those with disabilities. The maintenance of this existing system is important so that this network of sidewalks remains an asset to the community. The City has recently made a concerted effort to rehabilitate over 2,000 sections of sidewalks in poor condition, spending over $4 million in 2015 and $1 million in 2016 on sidewalk repairs in the last fiscal year.

The barrier for pedestrian travel tends to be crossing higher volume arterial streets at locations that do not have signalized traffic control. The presence of frequent vehicular curb cuts in some areas also inhibits pedestrian activity by creating more points for pedestrian and vehicle conflict.

[3] http://www.peopleforbikes.org/blog/entry/americas-10-best-new-bike-lanes-of-2015

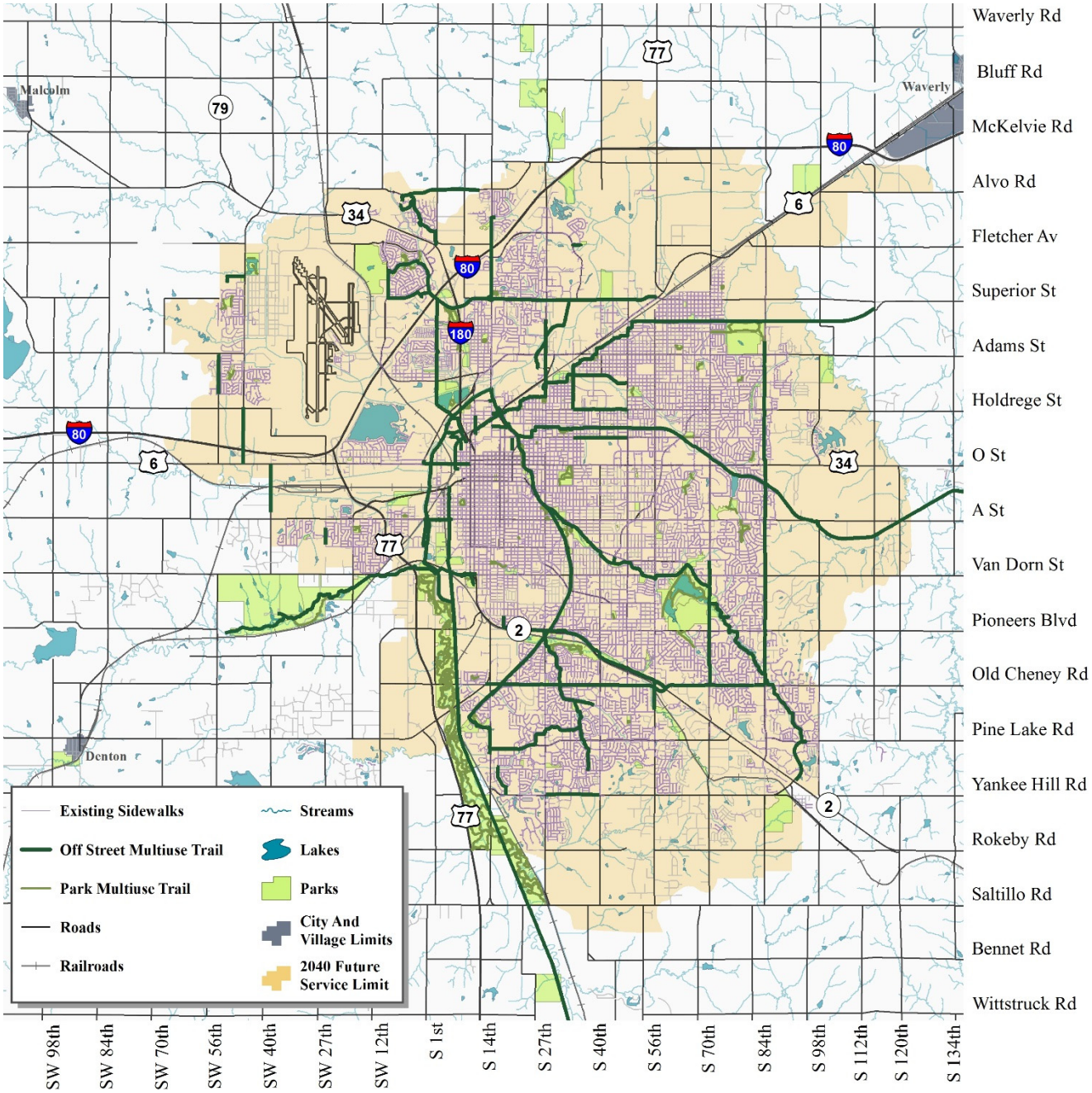
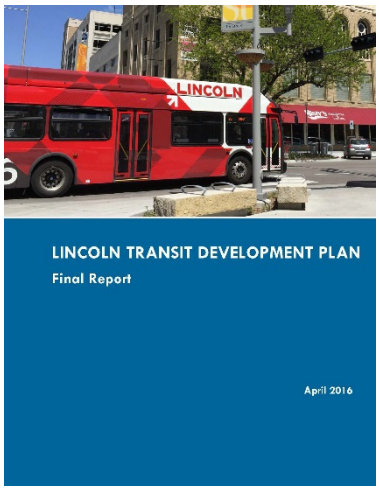


Figure 22. Existing Sidewalks and Trails

Transit



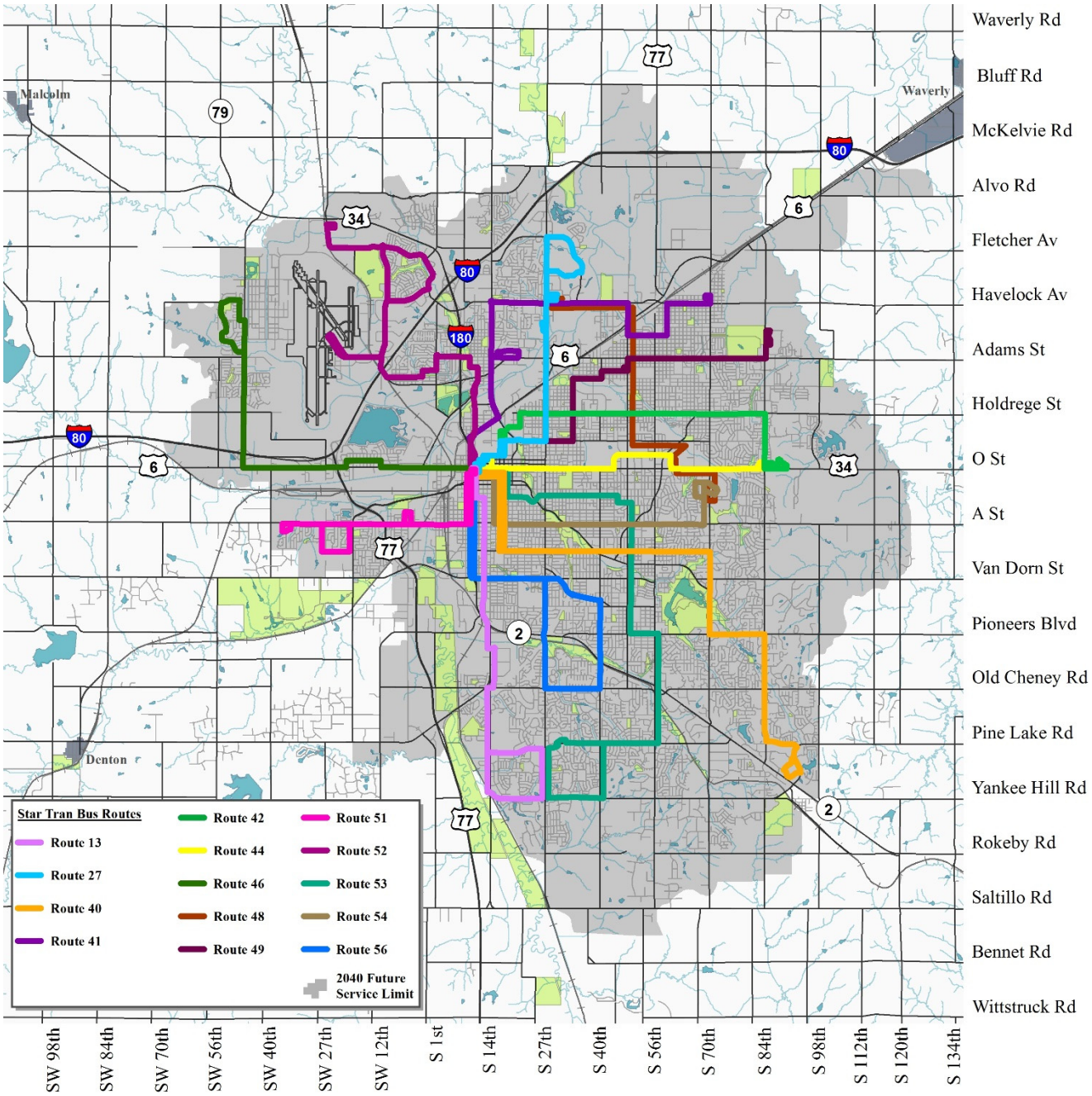
StarTran, a division of the City of Lincoln, provides fixed-route bus service within the city limits. In January 2015, StarTran launched the Transit Development Plan (TDP) effort to determine the best approach for improving and expanding transit service in Lincoln. The Plan, adopted in April 2016, concludes that the primary deficiencies in the existing StarTran system are limited service span (hours of operation), no Sunday service, and lack of frequent service. The Plan also identifies the need for better downtown connections.

StarTran's bus network in Lincoln (**Figure 23**) can be characterized as a hub-and-spoke system, in which all routes radiate from a single point. The primary hub for StarTran's 14 regular routes is a two-block on-street transfer point along 11th Street and N Street in downtown Lincoln. Because this two-block transfer point can accommodate only six buses at a time, timed connections among all routes serving downtown is not possible. There is a need for a single transfer point within downtown with enough capacity. This would allow streamlined alignments that would improve operational efficiency and reduce travel time for riders.

StarTran's fleet includes 67 fixed-route buses and 13 paratransit vehicles. The fleet is being converted, over time, to compressed natural gas (CNG). StarTran's use of CNG vehicles has reduced the amount of pollutants and greenhouse gases and decreased reliance on imported fuels. All StarTran fixed-route buses are equipped with bike racks, which can be an effective means of expanding the reach of transit service.

Intermodal Connections

As travel behaviors change and transportation technologies evolve, there is an increased awareness of the need for strong intermodal connections. Today, 6.5 percent of households in Lancaster County do not own a car—that number may increase as a result of the younger generation's preference for lower vehicle ownership and the desire to live, work, and play in concentrated areas. Technological advances such as Transportation Network Companies (TNCs), bike-sharing, bike racks on transit vehicles, and autonomous vehicles are making car-optional living more viable. To position Lincoln for these travel behavior and technology changes, there is a need to proactively plan for a strong interface between travel modes, allowing a mix of mobility options that are well-coordinated and can be competitive (in terms of travel time and cost) with private car ownership.



StarTran routes as of October 2016

Figure 23. StarTran Bus Routes

Rail

A network of railroad tracks extends radially from central Lincoln, as shown on **Figure 24.** Four railroad companies operate lines in Lincoln and Lancaster County: the BNSF Railway, the Union Pacific Railroad (UPRR), the OL&B Railroad, and the Omaha Public Power District (OPPD). Activity on the railroad lines ranges from 2 trains per day (on the UPRR and OPPD lines) to 63 trains per day on the BNSF-Creston line. Coal and agricultural products are the primary freight being moved by train through Lincoln, with some local manufacturing such as Kawasaki shipping light rail cars to the east coast.

Trains from four of BNSF's main lines—Ravenna, Cobb, St. Joseph, and Creston—cross connect through the Hobson Yard in Lincoln just west of downtown. The Hobson Yard is a vital service and support center for freight trains carrying coal and agricultural goods where inspections, maintenance, fueling, and switching all take place. The BNSF Havelock Shops in the northeast part of Lincoln are a primary freight rail car repair facility.

While the railroad lines through Lincoln and Lancaster County are critically important to the local economy, many railroad crossings with the street network are at-grade resulting in safety problems and travel delays. **Figure 24** shows the at-grade crossings in Lincoln and Lancaster County. The daily railroad crossing exposure rating (daily trains multiplied by the number of vehicles per day) reflects the potential for crashes between trains and motor vehicles at crossings. The NDOR – Rail and Public Transportation Division requires a minimum exposure rating of 50,000 to qualify for possible construction of a grade separation (underpass or overpass). There are 12 at-grade crossings with an exposure rating above 50,000, eight of which have an exposure rating greater than 100,000.

The Lincoln/Lancaster County Railroad Transportation Safety District (RTSD) identifies railroad crossings in need of work, prioritizes projects, and conducts studies to plan future work. The RTSD's mission has been to eliminate, as much as possible, conflicts between highway traffic and railroads in Lincoln and Lancaster County. Since its inception, many projects from its early long-range plan have been completed. The number of at-grade railroad crossings of public streets in Lancaster County has been reduced from 210 in 1970 to 114 today. About half of the closed crossings were due to abandonment, while the other half were due to consolidation and grade separations.

Freight

In addition to the railroads, the highway system in Lincoln plays an important role in freight movement. Currently, the primary truck routes through the region include all or portions of:

- I-80
- US 6
- US 34
- US 77
- Nebraska Hwy 2
- Nebraska Hwy 79
- 14th Street/Warlick Blvd (L55W)
- North 56th Street (L55X)
- 84th Street

Figure 25 shows the primary and secondary truck routes, along with the major truck destinations.

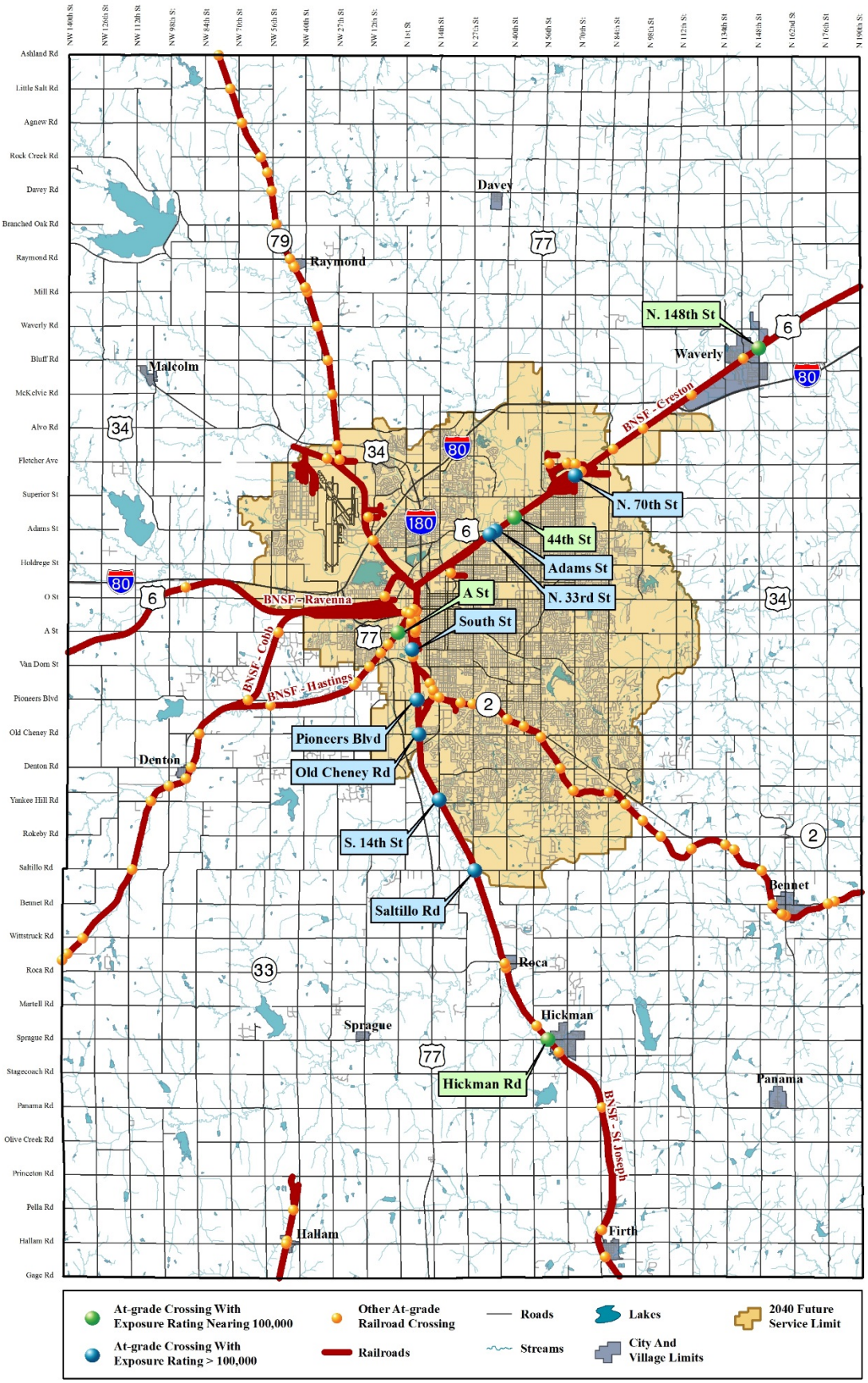


Figure 24. Railroad At-Grade Crossings

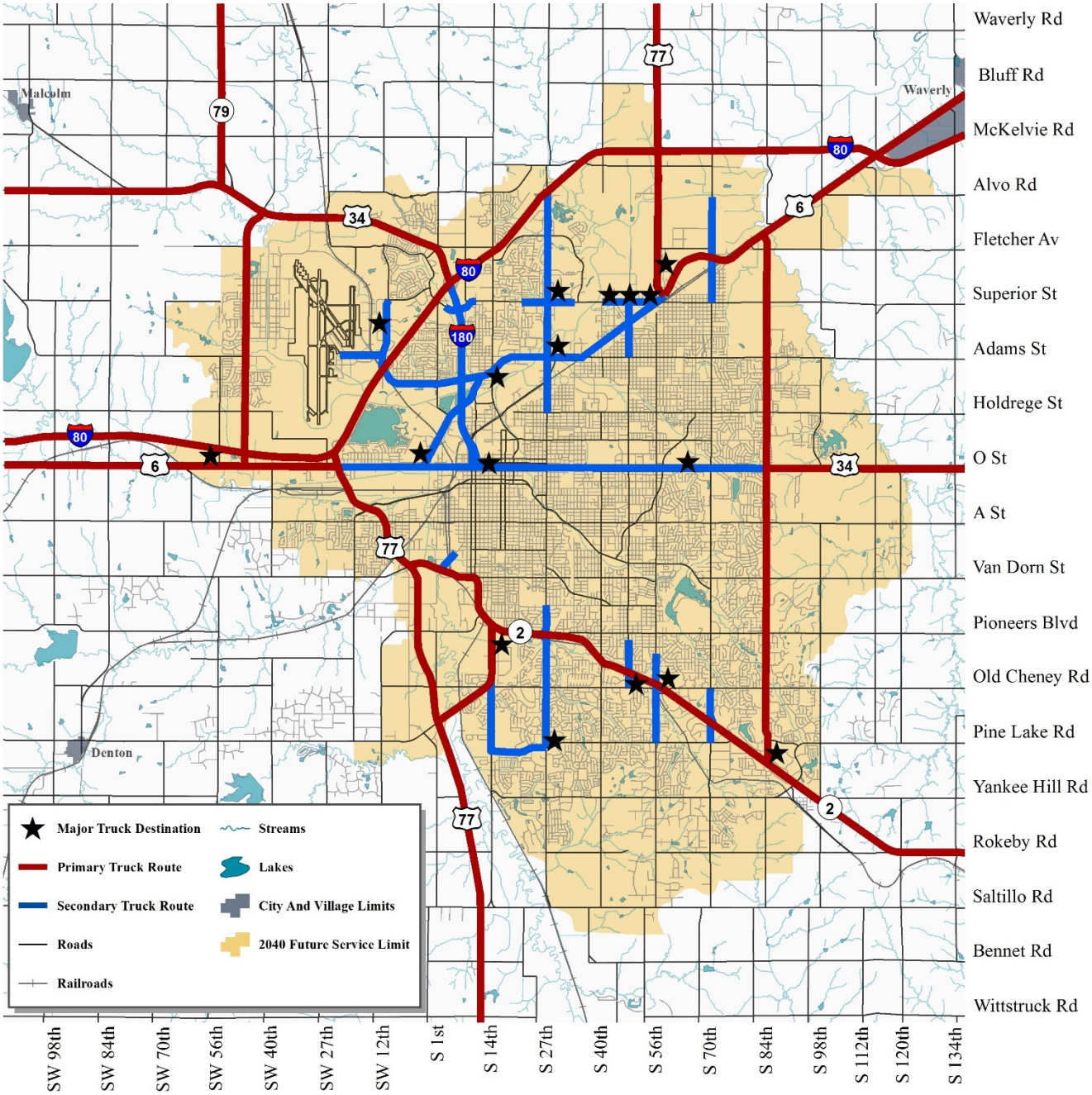


Figure 25. Truck Routes

Safety

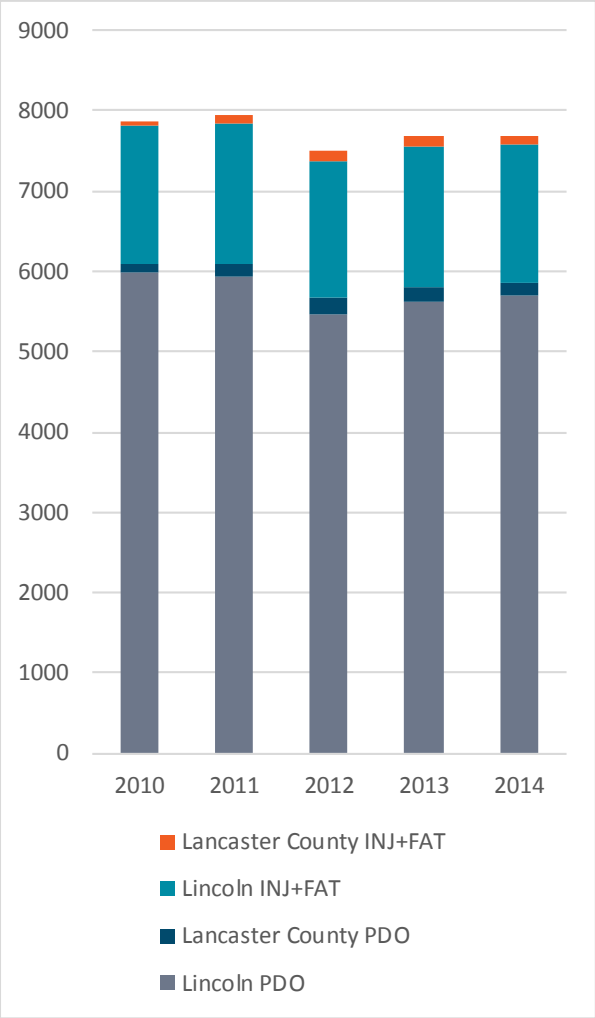
Safety is a top priority not only for Lincoln and Lancaster County but also at the state and federal levels. An understanding of the crash patterns that have occurred over time is important to identifying safety improvements. Crash data collected over the five-year time period between 2010 and 2014 show that there were over 38,600 crashes in Lincoln and Lancaster County, an average of roughly 7,700 crashes per year.

Figure 26 shows the severity of crashes in the region over time. Over the five-year period, there were 9,154 crashes resulting in injury (INJ) or fatality (FAT) – approximately 24 percent – and the remaining crashes involved property damage only (PDO). Allstate's 2015 "America's Best Drivers Report" ranks Lincoln as the 21st safest driving city in the country[4].

Table 8 lists in rank order the intersections with the highest Equivalent Property Damage Only (EPDO) crash rates during the 5-year period of 2011 through 2015. These intersections are candidates for focused safety improvements to address identified crash patterns.

Safety is a key element of successful bicycle and pedestrian networks. People may choose to ride or walk only if they feel safe and comfortable on the bikeway and pedestrian networks. The 2010–2014 crash history for Lincoln and Lancaster County was analyzed to identify bicycle-related and pedestrian-related crashes and severity over the five-year period. There were 735 vehicle-bicycle crashes over the five-year period on Lincoln and Lancaster County roads, an average of 147 per year. There were 470 vehicle-pedestrian crashes, an average of 94 per year.

Figure 26. Crash Severity



[4]https://www.allstate.com/resources/allstate/attachments/tools-and-resources/abd-report-2015.pdf

Table 8. Intersections with Highest Crash Rates

Rank	Intersection Location	EPDO Rate	5 Year Crash Total (2011 – 2015)
1	COTNER BLVD/O ST	13.8	146
2	DUXHALL DR/S 40TH ST	13.6	29
3	N ANTELOPE VALLEY PKWY/N 17TH ST	13.5	41
4	O ST/27TH ST	13.2	220
5	KNOX ST/N 27TH ST	13.0	98
6	VINE ST/N 27TH ST	12.5	176
7	P ST/N ANTELOPE VALLEY PKWY	12.0	22
8	R ST/N 46TH ST	12.0	20
9	A ST/S 48TH ST	11.9	78
10	A ST/S 13TH ST	11.6	39
11	NEBR HWY/S 40TH ST	11.6	124
12	PURPLE HEART HIGHWAY/W FLETCHER AVE	11.6	45
13	PINE LAKE RD/S 14TH ST	11.6	57
14	TICONDEROGA DR/N 27TH ST	11.5	42
15	NEBR HWY/S 70TH ST	11.5	69
16	CORNHUSKER HWY/N 27TH ST	11.2	238
17	O ST/48TH ST	11.1	212
18	SUPERIOR ST/N 14TH ST	11.0	262
19	A ST/S 18TH ST	10.9	26
20	P ST/N 22ND ST	10.7	15
21	CORNHUSKER HWY/N 44TH ST	10.7	28
22	SAUNDERS AVE/N ANTELOPE VALLEY PKWY	10.6	26
23	O ST/33RD ST	10.4	133
24	O ST/17TH ST	10.1	111
25	CAPITOL PKWY/S 27TH ST	10.0	130
26	VINE ST/N 48TH ST	10.0	122

Note: Based on Equivalent Property Damage Only rate; minimum of three or more crashes per year; EPDO Rate of 10.0 or higher

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