

## 5. Performance Measures

Performance-based planning affords a structure for this LRTP to ensure that scarce resources are used effectively and equitably. The community values of transportation are woven into the goals, objectives, performance measures, and ultimately, evaluation criteria, used to identify high-priority transportation projects. The LRTP is based on a set of goals intended to implement the vision and support the transportation needs and community values, while aligning with national goals and federal planning factors (as shown in **Table 13**).

This chapter is organized by the seven goal categories:

- Maintenance
- Mobility and System Reliability
- Livability and Travel Choice
- Safety and Security
- Economic Vitality
- Environmental Sustainability
- Funding and Cost Effectiveness

Goals and objectives are the foundation for performance-based planning; the seven goals articulate the desired end state, and the objectives are specific, measurable statements that support the achievement of a goal. Thirty-two system-level performance measures are linked directly to the objectives. Performance measures aid in planning, developing policy, prioritizing investments, and measuring progress. Several characteristics are common to good performance measures.

**Available Data** – Measures are often influenced by the availability of data and the ease of obtaining the data on a regular basis.

**Trackable over Time** – Measures should be based on consistently tracked data that can be compared annually or semiannually.

**Relation to Goals** – In performance-based planning, performance measures should track progress toward stated goals and objectives.

**Storytelling Potential** – Measures should be meaningful and help to weave a storyline around system performance. They can be an effective communication tool for requesting funds and garnering public support.

For each performance measure, available current and historic data show the current system performance and the trajectory of historic trends, providing insight into the projects, strategies, and policies needed to meet the stated performance targets. Specific performance targets have been identified for some performance measures; in other cases, a desired trend (increase, decrease, or maintain) has been identified.

Table 13. Relationship between LRTP Goals and FAST Act Goals and Planning Factors

		Lincoln MPO LRTP Transportation Goals						
		Maintenance: A well maintained system	Mobility and System Reliability: An efficient, reliable, and well-connected transportation system for moving people and freight	Livability and Travel Choice: A multimodal system that provides travel options to support a more compact, livable urban environment	Safety and Security: A safe and secure transportation system	Economic Vitality: A transportation system that supports economic vitality for residents and businesses	Environmental Sustainability: A transportation system that enhances the natural, cultural, and built environment	Funding and Cost Effectiveness: Collaboration in funding transportation projects that maximizes user benefits
FAST Act Planning Factors	Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency		✓			✓		✓
	Increase the safety of the transportation system for motorized and nonmotorized users				✓			
	Increase the security of the transportation system for motorized and nonmotorized users				✓			
	Increase the accessibility and mobility of people and for freight		✓					
	Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns			✓			✓	
	Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight			✓				
	Promote efficient system management and operation		✓					✓
	Emphasize the preservation of the existing transportation system	✓						
	Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation		✓				✓	
	Enhance travel and tourism		✓			✓		
FAST Act Goals	<b>Safety:</b> To achieve a significant reduction in traffic fatalities and serious injuries on all public roads				✓			
	<b>Infrastructure Condition:</b> To maintain the highway infrastructure asset system in a state of good repair	✓						
	<b>Congestion Reduction:</b> To achieve a significant reduction in congestion on the National Highway System		✓					
	<b>System Reliability:</b> To improve the efficiency of the surface transportation system		✓	✓				
	<b>Freight Movement and Economic Vitality:</b> To improve the national freight network and support regional economic development		✓			✓		
	<b>Environmental Sustainability:</b> To enhance the performance of the transportation system while protecting and enhancing the natural environment						✓	
	<b>Reduced Project Delivery Delays:</b> To reduce project costs, accelerate project completion, eliminate delays in project development, and reduce regulatory burdens							✓

## Maintenance



As the transportation system ages, increased funding is required for maintenance. Naturally, street systems built in the 1950s, 60s, and 70s have aged to the point of needing reinvestment. Nebraska's climate is also hard on streets—freeze/thaw cycles and extreme temperature ranges cause continual pressure on the transportation system. There is often competition between funding for new projects and funding for the maintenance and operation of the existing system. Reductions in maintenance funding today lead to higher costs in the future. Constructing new roads increases future maintenance costs as new facilities age.

**Goal:** A well-maintained transportation system.

### Objectives

Maintain streets, sidewalks, trails, transit fleet, and amenities to a state of good repair to maximize the value of Lincoln and Lancaster County transportation assets



### System Performance Measures

- 1 Percent of streets rehabilitated
- 2 Trail conditions
- 3 Square feet of sidewalks replaced
- 4 Age of traffic signals
- 5 Bridge sufficiency ratings
- 6 Age of transit vehicles

### Strategies

- Update the City's Asset Management Plan to include improved tracking
- Rehabilitate 5 percent of major streets, 3 percent of residential streets, and 1 percent of sidewalks each year
- Replace 15 signals each year (3 percent)
- Develop a methodology to monitor trail conditions

## Maintenance



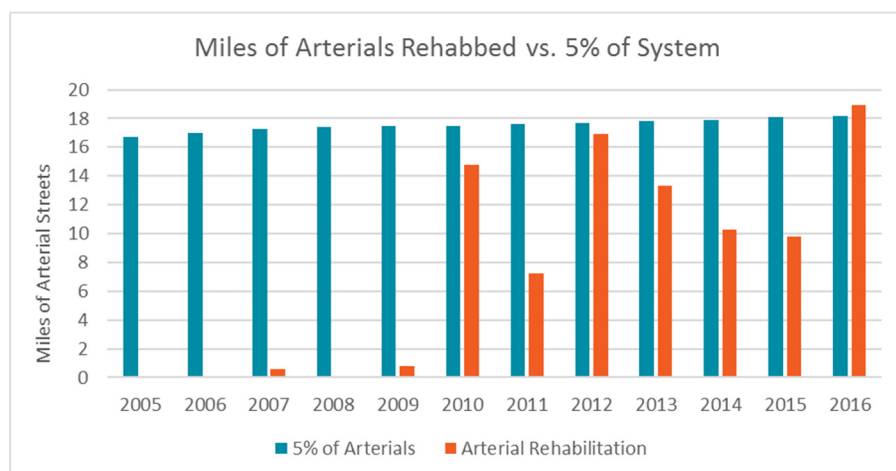
### 1 Percent of streets rehabilitated

The City of Lincoln's pavement management system aims to make the best use of limited funding to keep the City's transportation system functional. Lincoln has about 2,800 lane miles of streets. Maintaining an updated survey of pavement condition provides important data on how to prioritize street repair projects. The City's increased investment in street rehabilitation in 2016 resulted in a considerable improvement in the condition of the arterial streets. The charts below show the actual miles (or blocks) of street rehabilitation (in orange) compared to the City's goal (in blue) of rehabilitating 5 percent of arterials and 3 percent of residential streets annually. That is, each arterial street would be rehabilitated once every 20 years, and each residential street once every 33 years.

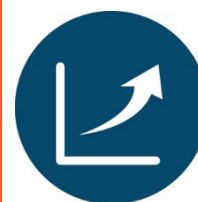
#### Baseline Data:

Percent of Arterial Streets Rehabilitated = **5.2%** (2016)

Percent of Residential Streets Rehabilitated = **0.6%** (2016)



#### Desired Trend:



#### Targets:

- Rehabilitate 5 percent of the arterial street system each year
- Rehabilitate 3 percent of the residential street system each year

#### Data Source(s) and Methodology:

The Public Works and Utilities Department tracks the percent of arterial and residential streets rehabilitated on an annual basis. Greater priority is given to arterial street streets due to their higher traffic volumes, speeds and potential for rapid deterioration.

## Maintenance



### 2 Trail conditions

The community treasures Lincoln's trail system, and maintaining the trails in a state of good repair is important. Collecting data on the condition of the trail segments will be helpful to the Lincoln Parks and Recreation Department in scheduling major rehabilitation projects.

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#### ***Baseline Data:***

No data available; collect beginning in 2017

#### ***Desired Trend:***

To be determined

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#### ***Data Source(s) and Methodology:***

The Lincoln Parks and Recreation Department is working to develop a methodology for assessing trail conditions.

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## Maintenance

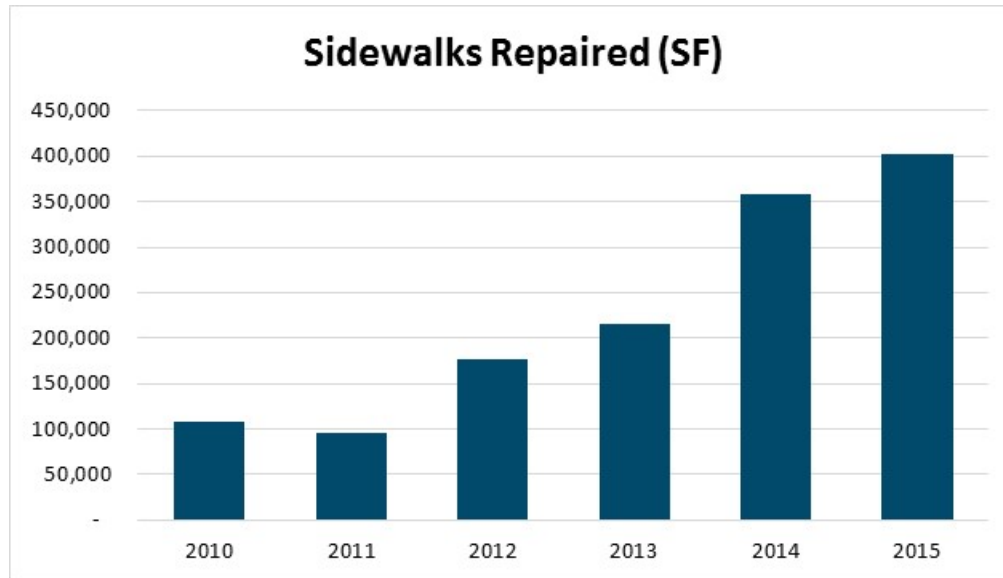


### 3 Square feet of sidewalks replaced

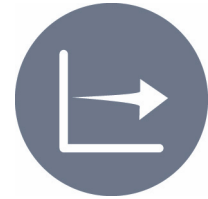
Many sidewalks in older areas of the City have developed cracks and heaving pavement and require maintenance, making them particularly difficult for those with disabilities. The maintenance of this existing system is important so that this network of sidewalks remains an asset to the community.

#### Baseline Data:

Square feet of sidewalks replaced = **402,200** (2015)



#### Desired Trend:



An extensive effort and investment (\$4 million) went toward sidewalk repairs in 2015. The 2016 budget of \$1 million is more in line with historic investments in sidewalk repairs.

#### Data Source(s) and Methodology:

The City of Lincoln Public Works and Utilities Department maintains an inventory of the sidewalk panel repairs and replacements.

## Maintenance



### 4 Age of traffic signals

The City of Lincoln maintains 430 traffic signals, including 350 full intersection signals, as well as pedestrian crossings, prepare-to-stop, and flasher locations. Currently, over 20 percent of the City's traffic signal installations are older than 30 years. By replacing these older traffic signals, current signal technology and interconnects can be introduced, resulting in not only reduced signal maintenance requirements, but also improved signal operations and coordination.

#### Baseline Data:

Number of traffic signals 30+ years old = **100** (2015)

#### Desired Trend:



#### Data Source(s) and Methodology:

The City of Lincoln Public Works and Utilities Department maintains a database of traffic signals that is updated as signals are replaced.

Maintenance



5 Bridge sufficiency ratings

Bridges provide important connections in the transportation system, providing vehicular, pedestrian, and bicycle crossings of highways and major roads, rivers, streams, and railroads, all of which would otherwise create barriers to transportation. The City of Lincoln owns and maintains 135 vehicle bridges, and Lancaster County maintains 184 bridges. Maintaining the City and County bridges to functional and safe conditions is a critically important component of achieving the maintenance goal.

Baseline Data:

City of Lincoln:

Percent of bridges with sufficiency rating > 80 = **77%** (2015)  
Percent of bridges with sufficiency rating > 50 = **96%** (2015)

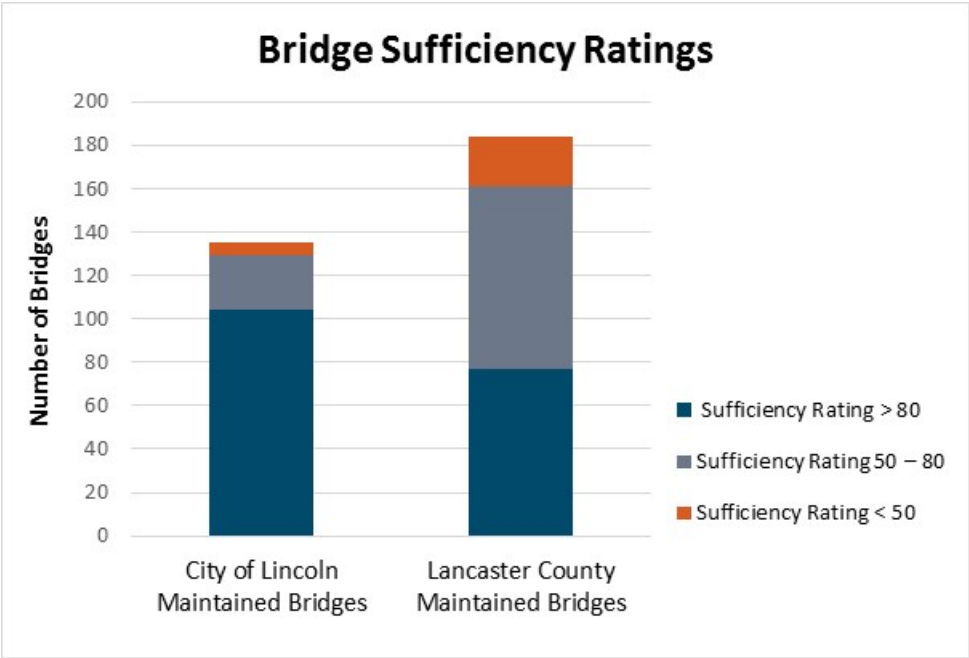
Lancaster County:

Percent of bridges with sufficiency rating > 80 = **42%** (2016)  
Percent of bridges with sufficiency rating > 50 = **88%** (2016)

Desired Trend:



The City of Lincoln’s target is to maintain at least 75 percent of bridges with a sufficiency rating above 80 and to increase the percentage of bridges with a sufficiency rating above 50 to 100 percent.



Data Source(s) and Methodology:

Both the City of Lincoln Public Works and Utilities Department and the Lancaster County Engineer’s Office maintain a database of bridge conditions. The database is updated following bi-annual inspections or when a bridge is rehabilitated or replaced. A bridge’s sufficiency rating measures 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 result from 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.



## Maintenance

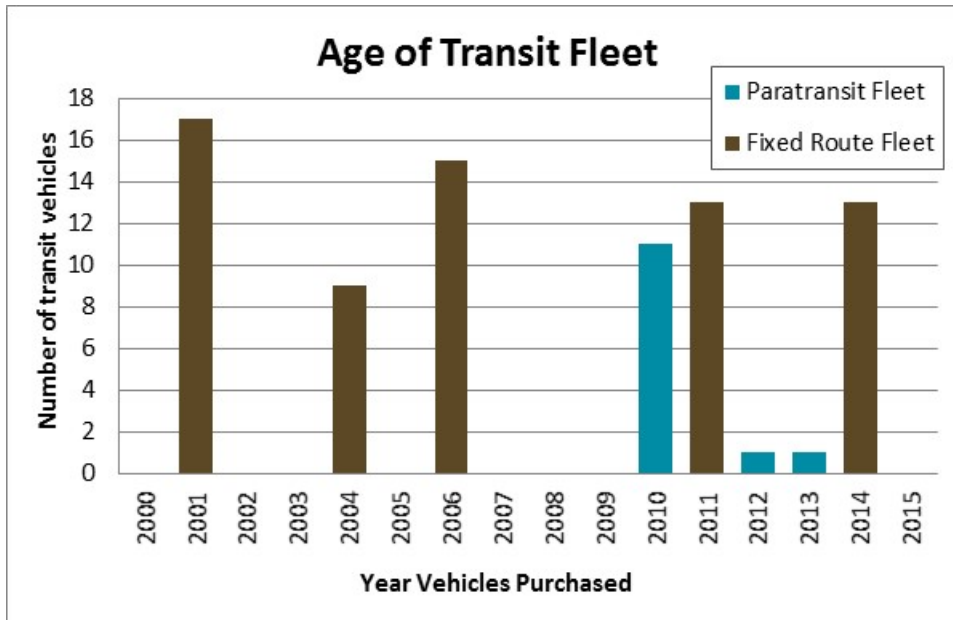


### 6 Age of transit vehicles

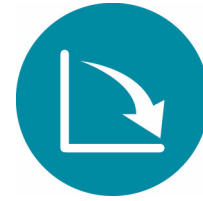
StarTran maintains a fleet of 67 fixed-route buses and 13 paratransit vehicles. All 80 vehicles are lift equipped. Within the next five years, more than half of the StarTran fixed-route fleet must be replaced, as vehicles are reaching the end of their useful lives.

#### Baseline Data:

Number of transit vehicles 12+ year old = 17



#### Desired Trend:



Reduce the number of transit vehicles 12+ years old

#### Data Source(s) and Methodology:

StarTran maintains an inventory of fixed-route buses and paratransit vehicles.

Mobility and System Reliability



An efficient system allows people to move from place to place in as direct a route as possible, reducing the amount of time spent in travel, the distance that must be traveled, and the amount of time spent in congested traffic. A transportation system that performs well allows users to choose multiple transportation modes and to move through those modes efficiently and reliably. Most travelers are less tolerant of unexpected delays because such delays have larger consequences than those that drivers face with everyday congestion.

**Goal:** An efficient, reliable, and well-connected transportation system for moving people and freight.

Objectives

Optimize the efficiency of the transportation network



System Performance Measures

1 Congested roadways

Improve the performance and reliability of the transportation system



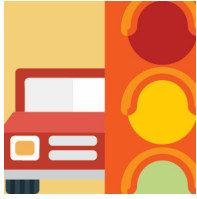
2 Transit on-time performance

3 Signal detection reliability

Strategies

- Address congestion through intersection improvements
- Improve intersection operations and coordinate signal timing
- Implement intelligent transportation systems (ITS)
- Implement transportation demand management (TDM) tools such as van-sharing

## Mobility and System Reliability



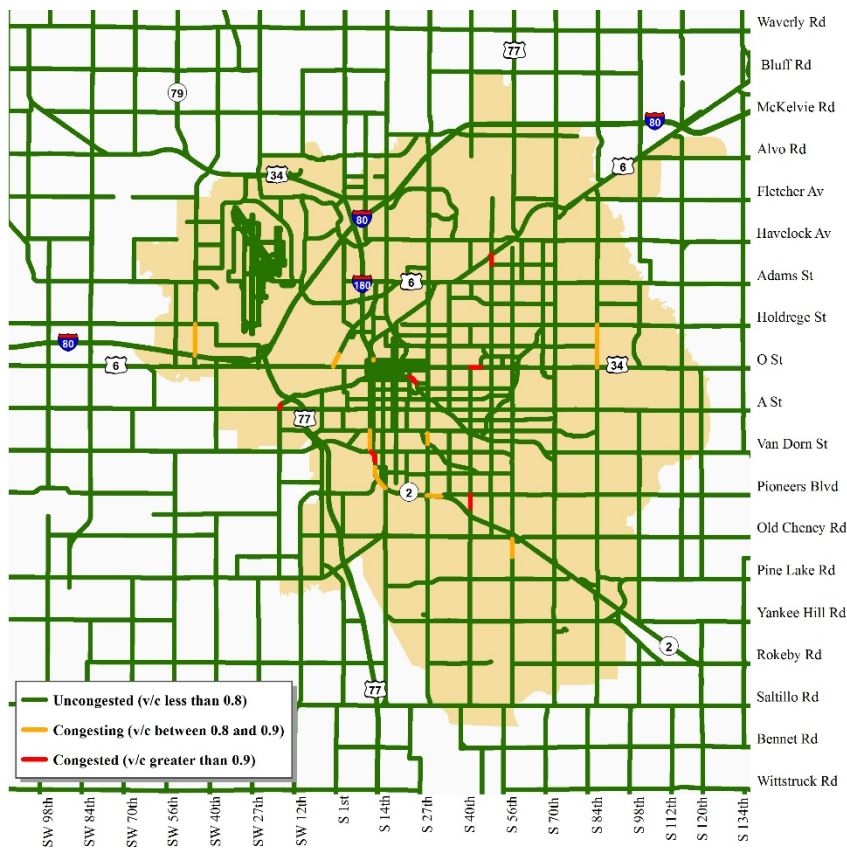
### 1 Congested roadways

Comparing traffic volumes with planning level capacities can be used in assessing the current congestion levels on the road network. Because this 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.

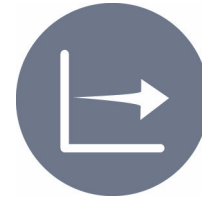
#### Baseline Data:

Congested roadways ( $v/c > 0.9$ ) = **0.5%** of major road network within the City of Lincoln (2015)

Congested + congesting roadways ( $v/c > 0.8$ ) = **1.5%** of major road network within the City of Lincoln (2015)



#### Desired Trend:



Target: Maintain at least 85 percent of roads in uncongested conditions.

Note: This target, based on the Mayor's Taking Charge Initiative, calls for maintaining roadway capacity to ensure that average vehicle delay does not exceed 35 seconds per vehicle at 85 percent of signalized intersections. The systemwide  $v/c$  ratios are not a perfect comparison with intersection congestion, but they do provide a system-level measure of congestion over time.

#### Data Source(s) and Methodology:

To perform this analysis, a volume to capacity ( $v/c$ ) ratio was calculated using daily traffic volumes and planning level capacities assumed for each roadway classification, area type, and number of lanes (these are the capacities used in the travel demand model). The baseline analysis used an extensive traffic count inventory completed in 2015.

Mobility and System Reliability



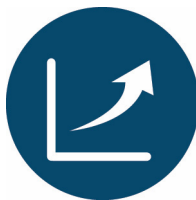
2 Transit on-time performance

Transit dependability refers to service that arrives on time. On weekdays, the average systemwide on-time performance is 61 percent of all trips within zero to five minutes late at every time point. Routes 51 and 52 have the best on-time performance, with 79 percent and 75 percent of trips being on-time, respectively. Route 54 has the highest percentage of late arrivals (42 percent). Routes 24, 40, 41, 44, 46, 49, and 55 all have late arrivals averaging 20 percent or higher. Routes 24, 40, and 42 have the highest averages of early trips (31 percent, 27 percent, and 28 percent, respectively). With a few exceptions, early arrivals appear to be more prevalent than late buses. It should be noted that no StarTran routes have recovery time at terminal time points incorporated into their schedules.

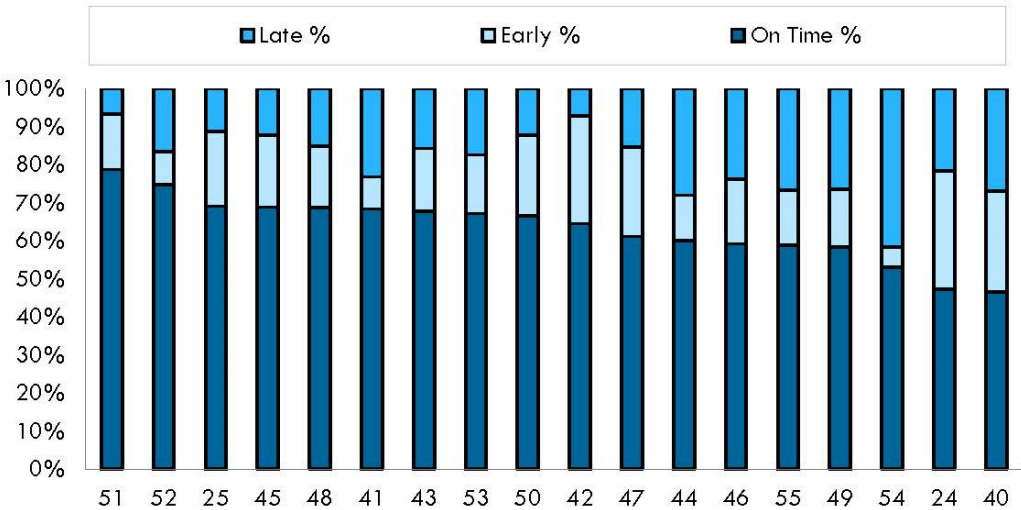
Baseline Data:

Transit on-time performance = 61% (2015)

Desired Trend:



Average Weekday Schedule Adherence by Route



Data Source(s) and Methodology:

StarTran vehicles are equipped with automatic passenger counters (APC) that also record the time vehicles arrive and depart time points. These data can be used to conduct a schedule adherence analysis for all StarTran fixed routes. The baseline data are based on the portion of trips that arrive within five minutes of the scheduled stop time (as documented in the StarTran Transit Development Plan Existing Conditions Report, September 2015).

## Mobility and System Reliability



### 3 Signal detection reliability

Vehicle detection systems can detect vehicles arriving at a signalized intersection, sending a message to the signal controller that a vehicle is present. This message triggers the controller to give the waiting vehicle(s) a green indication. If the signal detection system is faulty, it may send false positive triggers to the controller, or conversely it may not detect a waiting vehicle.

The reliability of the signal detection is important because it maximizes traffic flow efficiency. Lincoln's Traffic Engineering Section is working to improve the citywide detection systems using national best practices.

#### Baseline Data:

Signal detection reliability = **70%** (2015)

#### Desired Trend:



Target: 95 percent signal detection reliability

#### Data Source(s) and Methodology:

Lincoln Public Works and Utilities Department, Traffic Engineering Section is actively tracking the signal detection reliability.

Livability and Travel Choice



Lincoln ranks high as a livable city. The availability of a wide variety of mobility options, such as walking, biking, transit, and driving, is critical to maintaining or improving the quality of life for residents. Both older adults and the Millennial generation demonstrate a strong desire for walkable communities in which they can live proximate to jobs, shopping, and community activities. Connectivity between travel modes is important to enable a seamless transition between modes. Higher densities that encourage alternative travel modes can also help to maximize use of existing infrastructure.

**Goal:** A multimodal system that provides travel options to support a more compact, livable urban environment.

Objectives

Improve the quality of alternative transportation options (transit, biking, walking)



Accommodate all travel modes on Lincoln’s street network



System Performance Measures

- 1 Miles of trails, sidewalks, and on-street bike facilities
- 2 Annual transit ridership
- 3 Percent of transit-supportive areas served
- 4 Percent of projects incorporating Complete Streets elements

Strategies

- Reduce the demand for single occupant vehicle (SOV) travel through coordinated land use and transportation decisions
- Implement recommendations of the Transit Development Plan and the Bicycle and Pedestrian Capital Plan
- Support mixed use development and higher densities
- Consider the travel needs of the aging population
- Implement and fully support the bike share program (launch scheduled for 2017)



## Livability and Travel Choice



### 1 Miles of trails, sidewalks, and on-street bike facilities

The nonmotorized transportation network comprises trails, sidewalks, and the street network (with the exception of freeways). Designated on-street bike facilities help to identify the best routes for bicyclists (bike routes) and to provide designated space for bicyclists (bike lanes).

Trails, sidewalks, and on-street bike facilities are critical in providing travel choice options. As the network of nonmotorized infrastructure increases, residents have more options for travel and an increased quality of life.

#### Baseline Data:

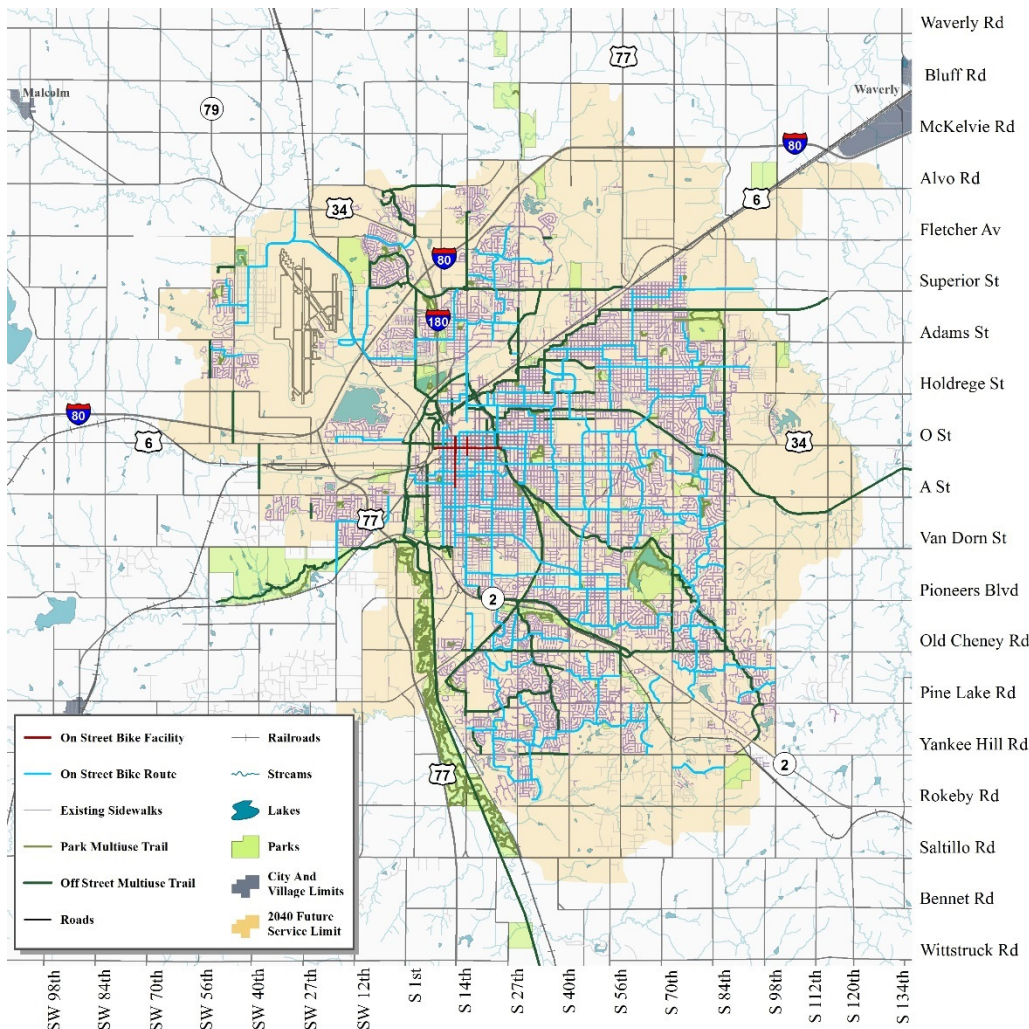
Miles of Sidewalks = **1,715** (2016)

Miles of Trails = **183** (2016)

Miles of Bike Lanes = **2.2** (2016)

Miles of On-Street Bike Routes = **141** (2016)

#### Desired Trend:



#### Data Source(s) and Methodology:

Lincoln/Lancaster County Planning Department GIS Data

Livability and Travel Choice

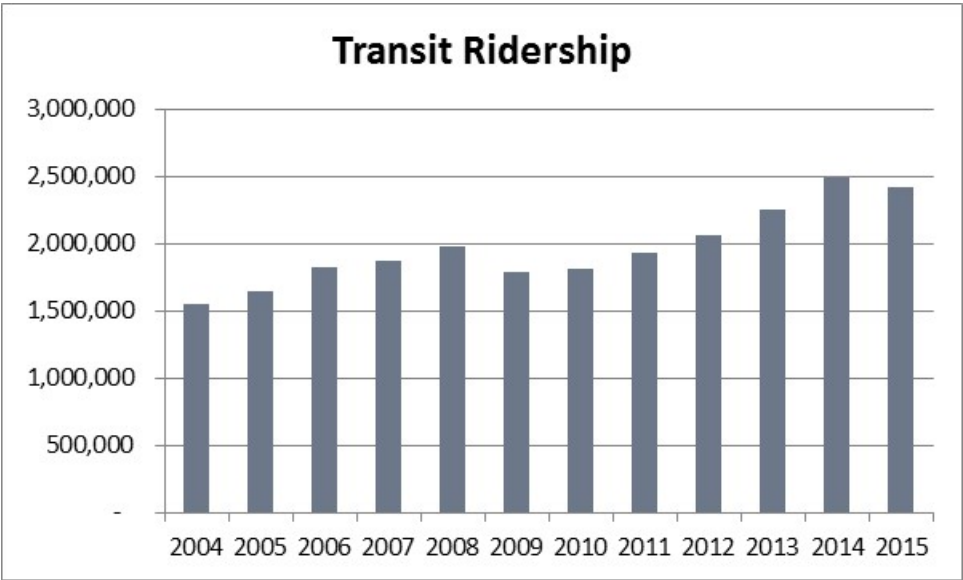


2 Annual transit ridership

StarTran has seen a steady growth in systemwide ridership over the past decade. From 2004 to 2015, annual ridership increased by 56 percent from roughly 1.5 million to 2.4 million.

Baseline Data:

Annual transit ridership = 2,415,096 (2015)



Desired Trend:



Target: Increase StarTran ridership by 5 percent per year

Note: Consistent with Mayor’s Taking Charge initiative.

Data Source(s) and Methodology:

StarTran, including fixed-route transit and paratransit trips



## Livability and Travel Choice



### 3 Percent of transit-supportive areas served

Several studies have indicated that the distance an average person can reside from a bus route and still be considered to “have service” is one-quarter mile, which is approximately equivalent to a five-minute walk. The TDP identifies a standard of providing service to at least 90 percent of transit-supportive areas, including high-density areas within one-quarter mile of a bus route, major activity centers, employers or employment concentrations of 200 or more employees, health centers, middle and high schools, colleges/universities, shopping centers of over 25 stores, and social service/government centers.

#### **Baseline Data:**

No data available; collect beginning in 2017

#### **Desired Trend:**

To be determined

#### **Data Source(s) and Methodology:**


StarTran completes a service area coverage calculation annually and will convert to this measure in 2017.

Livability and Travel Choice

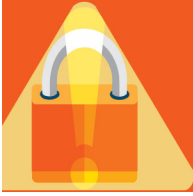


4 Percent of projects incorporating Complete Streets elements

In September 2013, Mayor Beutler signed Executive Order 086476, which approved Administrative Regulation No. 35, establishing a policy for the development of Complete Streets. The purpose for this Executive Order/Administrative Regulation was to encourage the design and operation of a transportation system that is safe and convenient for all users, regardless of age, ability, or transportation mode through the development of Complete Streets.

Baseline Data:	Desired Trend:
No data available; collect beginning in 2017	
<b>Data Source(s) and Methodology:</b> <p>The Executive Order/Administrative Regulation established a Complete Streets Committee to discuss how to implement Complete Streets within the community. The committee is an interdepartmental group composed of representatives from Planning, Public Works and Utilities, StarTran, Urban Development, Building and Safety, Parks and Recreation, and the Health Department. Complete Streets Committee members identify projects within their departments to be reviewed by the Committee. The Complete Streets Committee focuses on projects that have a regional significance. However, project plans are typically sent out to departments for review, and several Complete Streets Committee members review Public Works and Utilities projects for Complete Streets elements outside the regular meetings. The percentage of reviewed projects that incorporate Complete Streets elements will be reported in the Complete Streets Annual Report.</p>	

## Safety and Security



The safety and security of our transportation system for motorized and nonmotorized users are of critical importance. All transportation improvements should be designed to be safe and secure. Visibility, access control, and separation of incompatible modes, either through buffers or grade separations, are some of the methods that can be used to decrease conflicts and increase comfort. Security devices at key facilities, such as bus stops and trail head facilities, increase the safety and security of users. The federal government has established a goal of eliminating fatalities on the highway system—the “Vision Zero” initiative is reflected in the Lincoln MPO’s goal.

**Goal:** A safe and secure transportation system.

### Objectives

Reduce fatal, injury, and total crash rates for vehicles, bicyclists, and pedestrians



### System Performance Measures

- 1 Injury and fatal crashes per capita
- 2 Percent of total crashes involving injury or fatality
- 3 Bike crashes per 10K commuting bicyclist
- 4 Pedestrian crashes per 10K commuting pedestrian
- 5 Transit crashes per 100K miles driven
- 6 Number of programs/campaigns related to safety and security

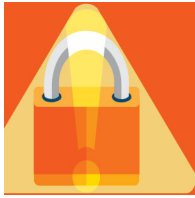
Improve personal security for transportation system users



### Strategies

- Help the transportation system recover swiftly from incidents
- Consider installation of protected bikeways to provide a physical separation between bicyclists and motorists
- Continue to develop an annual crash report focusing on identifying significant crash patterns and countermeasures
- Develop educational programs related to the safety and security of the transportation system

## Safety and Security

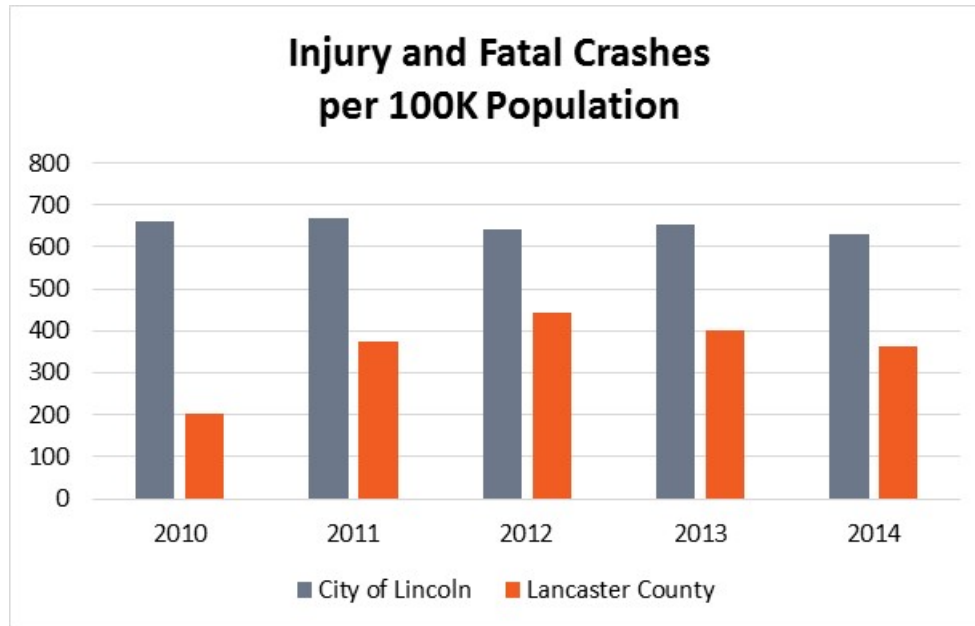


### 1 Injury and fatal crashes per capita

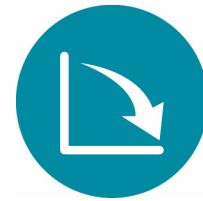
Traffic crashes are a major threat to public safety. This measure tracks the number of injury and fatal crashes per 100,000 population.

#### Baseline Data:

City of Lincoln injury and fatal crashes per 100K population = **632** (2014)



#### Desired Trend:



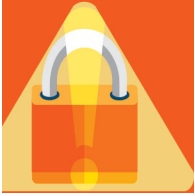
Target: Maintain an injury/fatal traffic crash rate of no more than 700 crashes per 100,000 population in the City of Lincoln

Note: Consistent with Mayor's Taking Charge initiative

#### Data Source(s) and Methodology:

These data are drawn from traffic crash investigation reports prepared by police officers. The Police Department, Public Works and Utilities Department, and State Department of Roads Accident Records Bureau compile data pertaining to Lincoln traffic crashes monthly and annually. The population data for the City of Lincoln is from the US Census. The County Engineer's Office provides the Lancaster County crash data. The population used to calculate Lancaster County's crash rate per capita is the Lancaster County population less the City of Lincoln population, from US Census data.

## Safety and Security



### 2 Percent of total crashes involving injury or fatality

Over the past five years, there has been an average of roughly 7,500 traffic crashes per year on Lincoln's transportation system and an average of approximately 260 traffic crashes per year on Lancaster County's roads. During the five-year time period (2010–2014), between 22 and 24 percent of the crashes in Lincoln have involved an injury or a fatality. The portion of injury or fatal crashes on Lancaster County roads has been higher—accounting for 34 to 41 percent of total crashes—and the percentage has been steadily rising each year. The federal government has established a goal of eliminating serious injuries and fatalities on the highway system—the “Vision Zero” initiative is reflected in this performance measure.

#### Baseline Data:

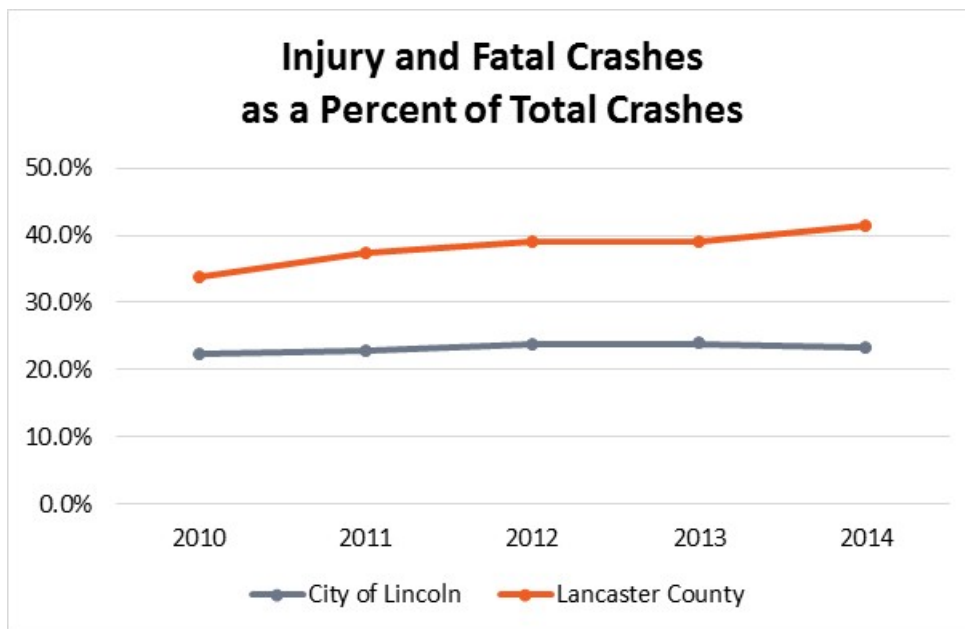
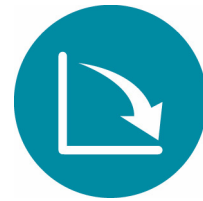
##### City of Lincoln:

Percent of total crashes involving injury or fatality = **23.3%** (2014)

##### Lancaster County:

Percent of total crashes involving injury or fatality = **41.3%** (2014)

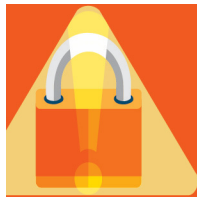
#### Desired Trend:



#### Data Source(s) and Methodology:

These data are drawn from traffic crash investigation reports prepared by police officers. The Police Department, Public Works and Utilities Department, and State Department of Roads Accident Records Bureau compile data pertaining to Lincoln traffic crashes monthly and annually. The County Engineer's Office provides Lancaster County crash data.

Safety and Security

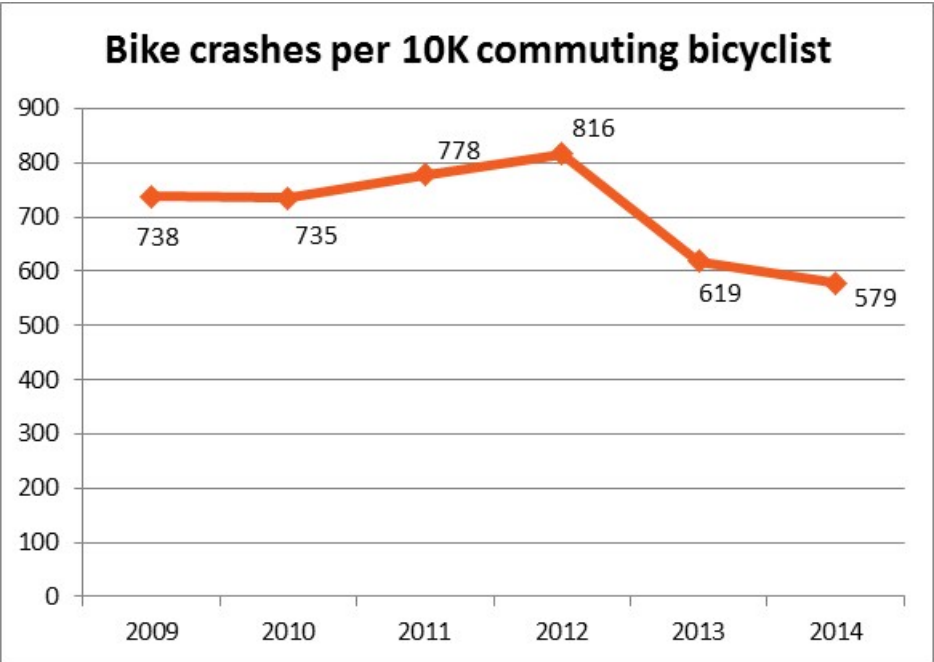


3 Bike crashes per 10K commuting bicyclist

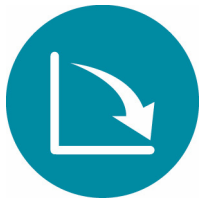
Crashes with motorized vehicles are a considerable safety risk to cyclists. In the past six years, there has been an average of 143 bicycle-involved crashes per year in the City of Lincoln. The ideal data to monitor bicycle-involved crash rates are not available. This measure is a commonly used indicator that normalizes the bicycle-involved crash data (which are readily available) with the estimated number of commuting bicyclists in Lincoln (reported by the American Community Survey) as a surrogate for total bicycle activity. The League of American Bicyclists (LAB) uses this measure as a key outcome for Bicycle Friendly Communities; the LAB’s benchmark for bronze Bicycle Friendly Communities is 370 or fewer bicycle crashes per 10K commuting bicyclists.

Baseline Data:

Bike crashes per 10K commuting bicyclists in the City of Lincoln = 579 (2014)



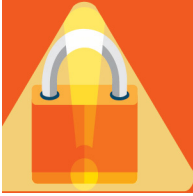
Desired Trend:



Data Source(s) and Methodology:

These bicycle crash data are drawn from traffic crash investigation reports prepared by police officers. The Police Department, Public Works and Utilities Department, and State Department of Roads Accident Records Bureau compile data pertaining to Lincoln traffic crashes monthly and annually. The number of commuting bicyclists in Lincoln is taken from 2005 to 2014 American Community Survey (ACS) 5-year estimates. The ACS reports means of travel to work on a 1-year and 5-year basis. The 5-year estimate is used for these performance measures because it is based on a larger sample size and provides a higher degree of reliability. A rolling 5-year average should be used to monitor changes in this measure over time. For example, the 2014 data point is based on the number of bike crashes in Lincoln in 2014 and on the 5-year estimate of commuting bicyclists for 2010–2014.

## Safety and Security



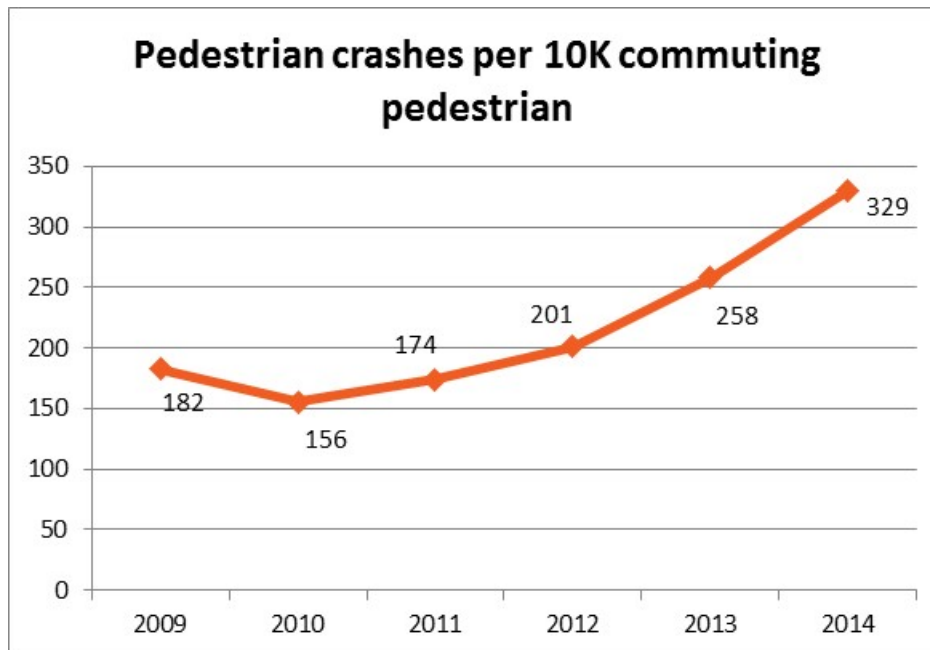
### 4 Pedestrian crashes per 10K commuting pedestrian

Crashes with motorized vehicles are also a safety risk for pedestrians; over the past six years there has been an average of 91 pedestrian-involved crashes per year in the City of Lincoln. Similar to the bike crash rate performance measure, this measure uses the number of commuting pedestrians (from ACS data) as a surrogate for the total level of pedestrian activity

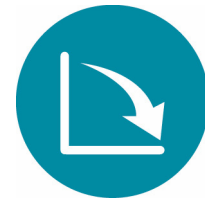
in Lincoln.

#### Baseline Data:

Pedestrian crashes per 10K commuting pedestrians in the City of Lincoln = **329** (2014)



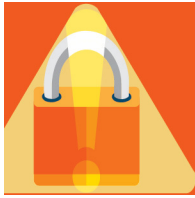
#### Desired Trend:



#### Data Source(s) and Methodology:

These pedestrian crash data are drawn from traffic crash investigation reports prepared by police officers. The Police Department, Public Works and Utilities Department, and State Department of Roads Accident Records Bureau compile data pertaining to Lincoln traffic crashes monthly and annually. The number of commuting pedestrians in Lincoln is taken from 2005 to 2014 ACS 5-year estimates. The ACS reports means of travel to work on a 1-year and 5-year basis. The 5-year estimate is used for these performance measures because it is based on a larger sample size and provides a higher degree of reliability. A rolling 5-year average should be used to monitor changes in this measure over time. For example, the 2014 data point is based on the number of pedestrian crashes in Lincoln in 2014 and on the 5-year estimate of commuting pedestrians for 2010–2014.

## Safety and Security

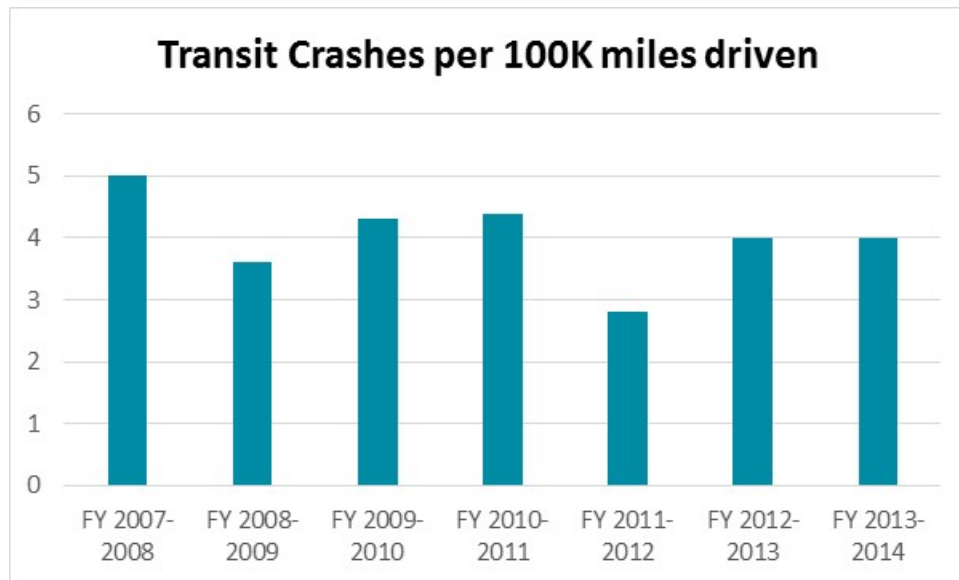


### 5 Transit crashes per 100K miles driven

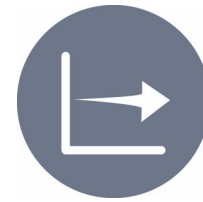
Riding the bus should provide a pleasant and safe riding environment for bus patrons. Crashes can cause injuries and disrupt patrons' riding experience. StarTran bus drivers must have a Commercial Driver's License, complete 40 hours of classroom training on safety, and have approximately 120 hours of supervised training behind the wheel before they are authorized to drive on their own. StarTran recognizes that vehicle crashes cannot be completely avoided but works to reduce their number and severity.

#### Baseline Data:

Transit crashes per 100K miles driven = **4.0** (FY 2013-2014)



#### Desired Trend:



Maintain a crash rate of less than 5.0 transit crashes per 100,000 miles driven.

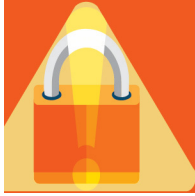
Note: Consistent with Mayor's Taking Charge initiative.

#### Data Source(s) and Methodology:

A crash occurs when a bus collides with a stationary or moving object (another vehicle or an object). The number of crashes is then compared to the number of miles driven annually by StarTran buses. Crashes are assessed by the Accident Review Board, which consists of StarTran staff, bus drivers, and Lincoln Police Department. The Board determines if a crash was preventable or non-preventable as a basis for management to potentially assign disciplinary action.



## Safety and Security



### 6 Number of programs/campaigns related to safety and security

Educational programs and public information campaigns can serve as a highly effective means of improving safety and security by changing behaviors of travelers of all modes. Safety campaigns can cover a broad range of topics and should be focused to best reach the target audience for the particular topic. Examples of safety campaign topics include sharing the road (with bicyclists and pedestrians), wearing seatbelts, minimizing distracted driving, avoiding aggressive driving, stopping drunk driving, etc.

#### **Baseline Data:**

No data available; collect beginning in 2017

#### **Desired Trend:**

To be determined

#### **Data Source(s) and Methodology:**

Economic Vitality



Economic vitality requires that many characteristics beyond transportation facilities be present, including a low cost of doing business, availability and access to technology, an educated and skilled workforce, choice of housing types, high-quality schools, low municipal and state debt, and other less tangible qualities. A good transportation system, which includes transit, vehicle, freight, air, nonmotorized, and rail modes all integrated with land use, can help contribute to these factors.

**Goal:** A transportation system that supports economic vitality for residents and businesses.

Objectives

System Performance Measures

Reduce the cost of transportation for system users

Improve the economic competitiveness of the region by enhancing the transportation system



- 1 Travel time to work
- 2 Jobs accessible in a 30-minute transit ride

Improve the operations of the existing freight transportation system



- 3 Number of potential stops on primary truck routes
- 4 Exposure rating of railroad at-grade crossings

Strategies

- Fund and construct the South and East Beltways
- Grade separate railroad crossings
- Support affordable housing and higher densities
- Implement the recommendations in the Transit Development Plan
- Provide bicycle and pedestrian connections between neighborhoods and employment centers
- Continue funding Railroad Transportation Safety District (RTSD)
- Implement adaptive signal control on major truck routes

## Economic Vitality

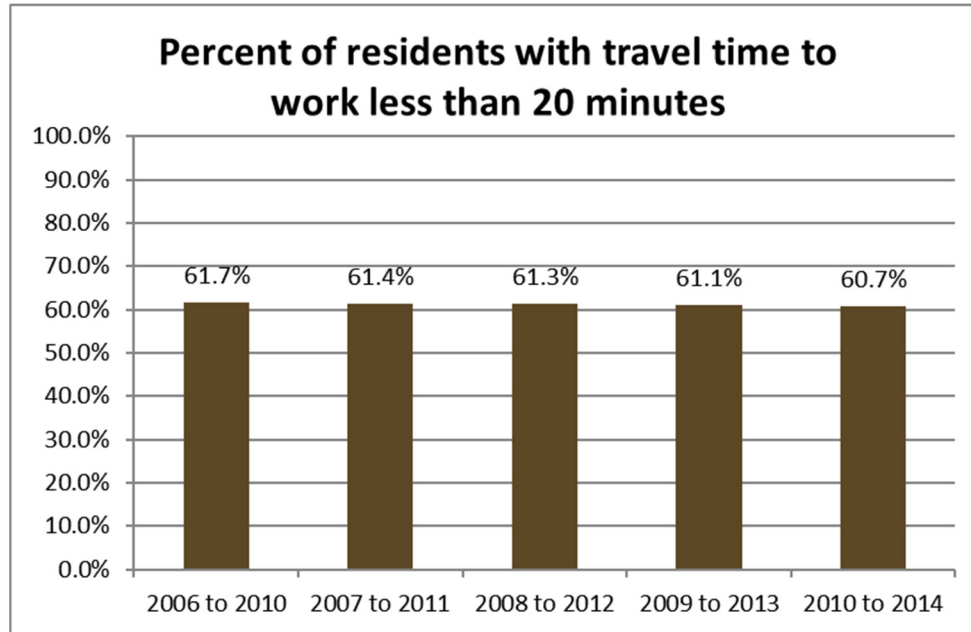


### 1 Travel time to work

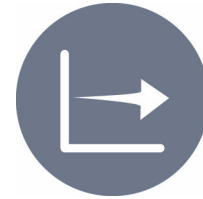
Many factors influence the amount of time it takes to travel between home and work, such as mode of travel, the availability of desirable housing near job centers, and levels of traffic congestion.

#### Baseline Data:

Percent of residents with travel time work < 20 minutes = **60.7%** (2010–2014)



#### Desired Trend:



Target: Maintain 60 percent or more of City residents reporting travel time to work as less than 20 minutes.

Note: Consistent with Mayor's Taking Charge initiative.

#### Data Source(s) and Methodology:

2006 to 2014 ACS 5-year estimates. A rolling 5-year average should be used to monitor changes in this metric over time.

Economic Vitality



2 Jobs accessible in a 30-minute transit ride

The number of jobs accessible in a 30-minute transit ride reflects the potential of employees to travel by transit. The numbers of jobs accessible in a 30-minute transit ride can be increased by expanding the transit service (expand existing routes, add new routes), by increasing the number of jobs along transit routes, or by using a combination of both

approaches.

Baseline Data:

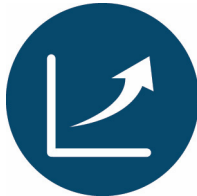
Lincoln:

Average number of jobs accessible in 30-minute transit ride = 80,398

Lancaster County (including the City of Lincoln):

Average number of jobs accessible in 30-minute transit ride = 73,243

Desired Trend:




Data Source(s) and Methodology:

Center for Neighborhood Technology (CNT) All Transit application. The application is the largest source of transit connectivity, access, and frequency data in America. The value indicates that, on average, a household in the specified geographic area (Lincoln or Lancaster County) could access the specified number of jobs by riding transit a half hour or less.

## Economic Vitality



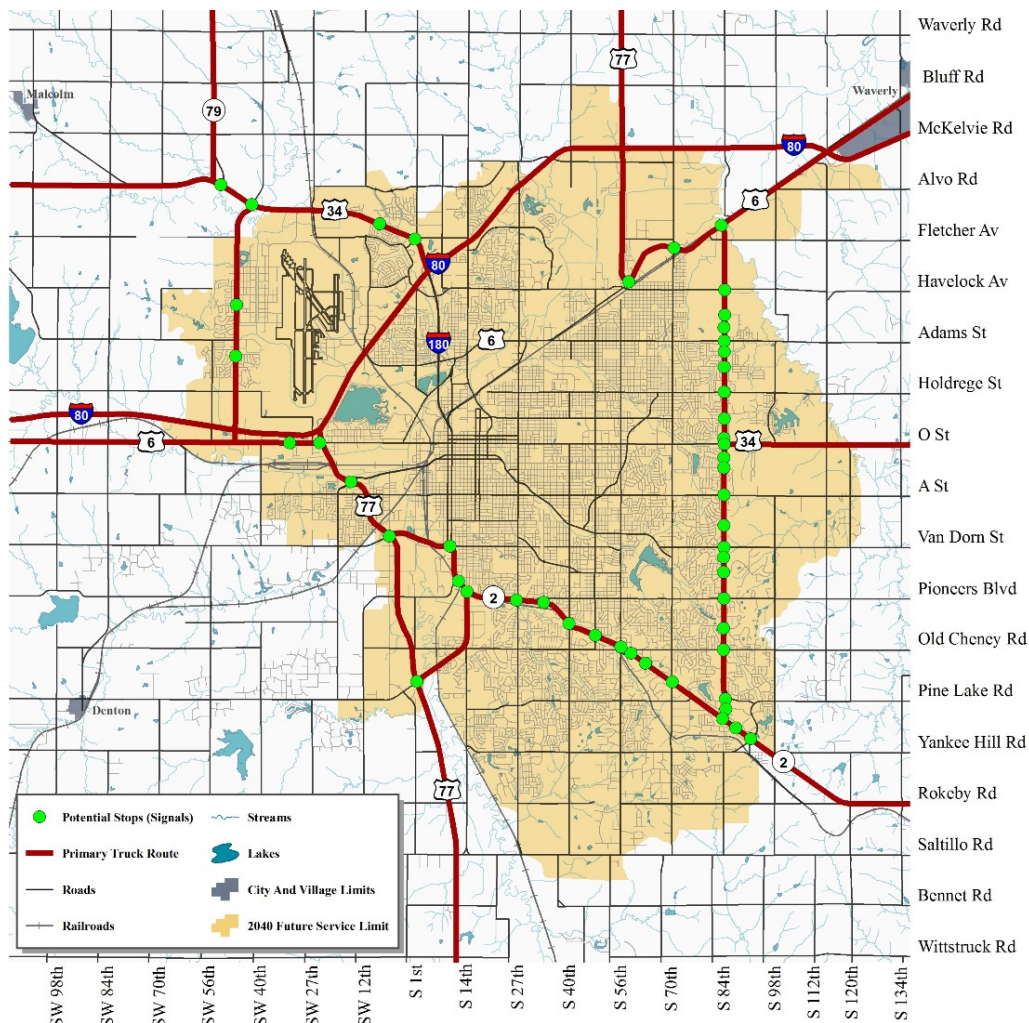
### 3 Number of potential stops on primary truck routes



The efficient movement of freight through Lincoln's transportation system is an important aspect of economic vitality. Access-controlled facilities such as interstates and expressways offer an efficient means for freight to be transported in and out of the Lincoln area. Trucks also use several arterial streets as a part of the primary truck route network, many of which have signalized intersections at half-mile or less intervals. These signalized intersections represent potential stops for trucks, which can result in slower travel times. The fewer signalized intersections that trucks are exposed to, the more efficient freight movement on the roadway network can be.

### Baseline Data:

Number of potential stops on primary truck routes = **51** (2015)



**Desired Trend:**



**Data Source(s) and Methodology:**

City of Lincoln Public Works and Utilities Department, GIS database.

## Economic Vitality



### 4 Exposure rating of railroad at-grade crossings

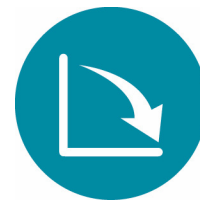
A network of railroad tracks extends radially from central Lincoln; the railroad lines are important to the local economy. Many railroad crossings within the street network are at-grade and result in safety problems and travel delays, negatively impacting the local economy. The daily railroad crossing 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). The BNSF Subdivisions are shown on **Figure 25** in **Chapter 3**.

#### Baseline Data:

Railroad at-grade crossings with exposure rating > 100K = **8** (2015)

Street Crossing	BNSF Subdivision	Daily Exposure		
		Vehicles	Trains	Rating
Adams Street	Creston	10900	65	708,500
N. 33rd Street	Creston	9300	65	604,500
Old Cheney Road	St. Joseph	12980	43	558,140
N. 70th Street	Creston	5930	65	385,450
Saltillo Road	St. Joseph	7937	43	341,291
South Street	St. Joseph	5000	43	215,000
Pioneers Boulevard	St. Joseph	3170	43	136,310
S. 14th Street	St. Joseph	2394	43	102,942
N. 44th Street	Creston	1500	65	97,500
Hickman Road	St. Joseph	2135	43	91,805
W. A Street	Hastings	7000	13	91,000
N. 148th Street	Creston	1350	65	87,750

#### Desired Trend:



#### Data Source(s) and Methodology:

City of Lincoln Public Works and Utilities Department and Railroad Transportation Safety District (RTSD).

## Environmental Sustainability



Environmental stewardship of the natural environment and the cultural and built environment is a priority in the Moving Ahead for Progress in the 21st Century Act (MAP-21) and for the Lincoln MPO. Fossil fuels are limited in supply, and their burning has many effects on the environment, including increased greenhouse gases, particulate matter, and effects on global warming. Transportation projects in new areas often cross water ways, disturb land, and cut through tree masses. It is important, wherever possible, to avoid these resources or to mitigate their disturbances. Preserving the value and character of existing neighborhoods is also an important consideration, and particular attention shall be paid where a large portion of the population belongs to traditionally under-represented groups.

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**Goal:** A transportation system that enhances the natural, cultural, and built environment.

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### Objectives

### System Performance Measures

Maintain compliance with air quality standards



① Vehicle miles of travel (VMT) per capita

② Mobile source emissions

Reduce fossil fuel consumption by providing access to alternative modes and fuels



③ Mode split

④ Number of alternatively fueled vehicles (AFVs) in fleet

Avoid, minimize, and mitigate environmental impacts of transportation projects to the extent reasonably practical



⑤ Miles of minimal impact projects completed (2+1)

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### Strategies

- Implement Complete Streets projects and expand the on-street bike network for commuting purposes
  - Convert City and County fleet to alternatively fueled vehicles
  - Encourage the provision of electric charging stations
  - Incorporate sustainable design elements into transportation projects by using low-impact development (LID) techniques to reduce runoff, alternative street designs, and permeable pavement
  - Minimize impacts of transportation projects on the natural environment
  - Reduce impacts of transportation projects on neighborhoods and cultural and historic resources
  - Encourage infill development and higher densities that reduce demand for travel
-

Environmental Sustainability

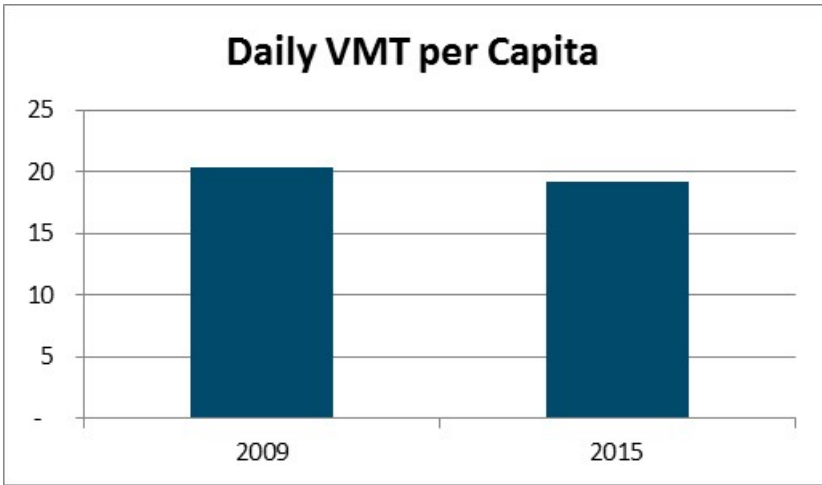


1 Vehicle miles of travel (VMT) per capita

Public health is an increasingly important topic in transportation planning, and planning in general. The availability of nonmotorized transportation options can have a great effect on public health by increasing time spent walking and biking. Shorter trips can be accomplished by creating more mixed use, compact neighborhoods, or increasing the integration of residential land uses into existing commercial areas through redevelopment.

Baseline Data:

Vehicle miles of travel (VMT) = 5,255,500 (2015)  
VMT per capita = 18.95 (2015)



Desired Trend:



Data Source(s) and Methodology:

Daily VMT is calculated using the base year Lincoln MPO travel demand model; population is from the US Census for the City of Lincoln.



## Environmental Sustainability



### 2 Mobile source emissions

Air quality is important for public health, environmental sustainability, and a good quality of life. The US Environmental Protection Agency has recently lowered some of the federal air quality standards, which relate to vehicle emissions. Even so, the Lincoln area should remain in attainment of the federal air quality standards, and one of the primary functions of this LRTP is to ensure that the fiscally constrained plan will help maintain attainment status into the future.

#### Baseline Data:

#### Daily Emissions Totals

Emission Type	2015
Volatile Organic Compounds (tons VOC) – Summer	4.6
Nitrogen Oxides (tons NO <sub>x</sub> ) – Summer	8.4
Carbon Monoxide (tons CO) – Winter	47.7
Greenhouse Gases (tons CO <sub>2</sub> Equivalent) – Summer	3,591
Greenhouse Gases (tons CO <sub>2</sub> Equivalent) – Winter	2,840

#### Desired Trend:



#### Data Source(s) and Methodology:

Lincoln MPO regional travel demand model and Motor Vehicle Emission Simulator (MOVES2014) calculations.

Environmental Sustainability

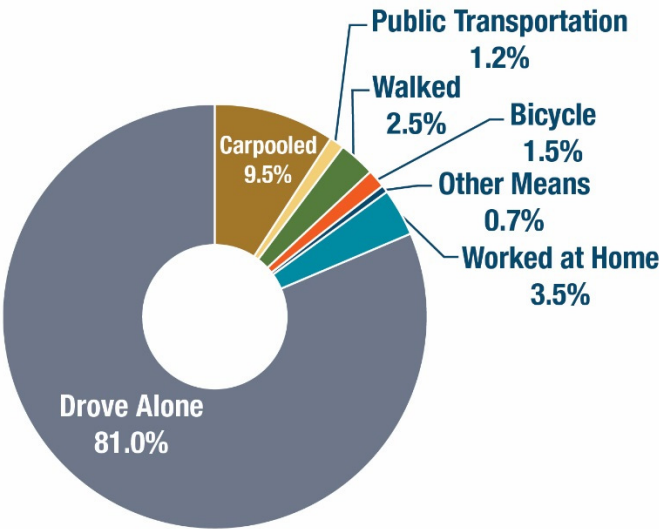


3 Mode split

The way in which workers get to and from work is an important transportation metric. Driving alone is by far the most commonly used mode of transportation for Lancaster County. More than four out of five residents drive alone to work. Encouraging more residents to use commuting methods other than the single occupant vehicle is important to enhance economic development and diversification, help build community ties, improve quality of life through the freedom of choice, and promote a healthy lifestyle. Further, an increased number of trips using non-single occupant vehicle modes reduces the number of vehicles on roadways and, therefore, reduces congestion and traffic delays, improves air quality, and enhances access to jobs and schools. Many factors impact the mode choice by commuters including, but not limited to, fuel prices, travel time, infrastructure conditions and availability, education, convenience, income, weather, parking (for bike or vehicle), cultural norms, availability of showers/lockers at work, and overall personal preference.

Baseline Data:

Mode share of non-SOV trips in Lancaster County = 19.0% (2010–2014 5-year estimate)



Desired Trend:



Data Source(s) and Methodology:

The information for this indicator comes from the ACS, which is collected and compiled annually by the US Census Bureau. The ACS reports means of travel to work on a 1-year and 5-year basis. The 2010 to 2014 5-year estimate is used for this performance measure because it is based on a larger sample size and provides a higher degree of reliability. The baseline data for mode share are for all of Lancaster County. A rolling 5-year average should be used to monitor changes in this metric over time.

## Environmental Sustainability



### 4 Number of alternatively fueled vehicles (AFVs) in fleet

Increasing the share of AFVs in the region contributes to the objectives of reducing air pollutant emissions and dependency on fossil fuels. Alternative fuel refers to fuels that are used in place of gasoline and diesel fuel; the US Environmental Protection Agency refers to them as clean fuels and defines them as those fuels that create less pollution than today's gasoline. The US Department of Energy lists AFVs as biodiesel, electricity, ethanol, hydrogen, methanol, natural gas, propane, p-series, and solar energy.

#### Baseline Data:

##### StarTran (2015):

13 Compressed Natural Gas (CNG) buses

##### City of Lincoln (2015):

1 CNG library bookmobile

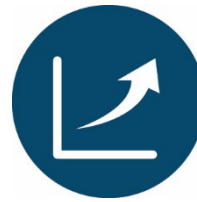
6 CNG passenger sedans

1 biofuel passenger sedan

38 electric hybrid passenger sedans

Total: **59** AFVs (2015)

#### Desired Trend:



#### Data Source(s) and Methodology:

This performance measure focuses on AFVs in the City, County, and StarTran fleets.

## Environmental Sustainability



### 5 Miles of minimal impact projects completed (2+1)

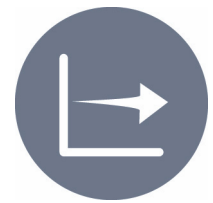
Preserving the value and character of existing neighborhoods is an important consideration and efforts should be made to minimize impacts on established neighborhoods and investments. In the past, many transportation projects in our country displaced citizens, destroyed valuable cultural resources, and displaced or divided neighborhoods.

Transportation planning has since evolved to include a strong link to environmental justice, which is both desirable and required. It is vitally important that the residents, particularly those with larger underrepresented populations, be involved in transportation planning decisions and that these decisions consider and work to protect those resources important to neighborhoods.

#### Baseline Data:

Street Segment	Length (miles)	Year
Adams St from 57th St to 63rd St	0.44	2011
Holdrege St from 70th St to 79th St	0.62	2011
North 70th St from Aylesworth Ave to X St	0.39	2011
Fremont St from 48th St to 70th St	0.23	2011
Pioneers Blvd from Hwy 2 to 56th St	1.65	2012
South 56th St from Randolph St to South St	1.00	2013
North 1st St from Superior St to Cornhusker Hwy	1.5	2013
Van Dorn St from 33rd St to 37th St	0.25	2015

#### Desired Trend:



#### Data Source(s) and Methodology:

City of Lincoln Public Works and Utilities Department.

## Funding and Cost Effectiveness



Public funding, both locally and nationally, for transportation facilities is extremely tight. Public and private groups have expressed the desire to see funds spent in the most efficient way possible. A successful transportation network comes from public, private, and nonprofit entities working together to achieve mutually beneficial goals. The Lincoln MPO seeks to explore creative options to fund high-priority transportation projects.

**Goal:** Collaboration in funding transportation projects that maximizes user benefits.

### Objectives

Make the best use of public financial resources



### System Performance Measures

- 1 Cost per user of completed projects
- 2 Proportion of completed projects subjected to life cycle cost analysis

Decrease the gap between funding needed to achieve LRTP goals and currently available funding



- 3 Annual funding for transportation projects

### Strategies

- Consider creative alternative funding sources, such as public-private partnerships
- Implement roadway improvement projects over time based on need, applying the Rural to Urban Transition for Streets (RUTS) program
- Consider indexing the Wheel Tax
- Improve communication to the public about the need for increased transportation funding

Funding and Cost Effectiveness



1 Cost per user of completed projects

Projects should not be compared strictly on the basis of costs. A large project will have a high cost; however, that project may have a profound positive effect on the overall transportation system. Both costs and benefits must be evaluated when prioritizing projects. A benefit-cost analysis is frequently used to demonstrate economic justification for transportation projects.

Because a benefit-cost analysis requires extensive data and analysis to monetize a project’s benefits (many of which are difficult to readily monetize), this performance measure—cost per user of completed projects—represents a simplified approach to considering the cost effectiveness of public investment in transportation projects.

<b>Baseline Data:</b> No data available; collect beginning in 2017	<b>Desired Trend:</b> To be determined
<b>Data Source(s) and Methodology:</b> The Lincoln MPO will track the cost per user of completed projects using the total capital cost of the project and the number of users, as defined by the number of persons per day expected to use and benefit from the project upon completion. The persons per day may be transit ridership on a particular route, the daily traffic volume times average auto occupancy on a road segment, or the number of bicyclists/pedestrians expected to use a certain facility.	

## Funding and Cost Effectiveness



### 2 Proportion of completed projects subjected to life cycle cost analysis

Life cycle cost analysis evaluates the total economic worth of a transportation project by analyzing the initial capital costs and discounted future costs including maintenance, reconstruction, and operating costs over the life of the project. A life cycle cost analysis can be used in the alternatives analysis phase, providing a comparison of total cost of various

investment options.

#### **Baseline Data:**

No data available; collect beginning in 2017

#### **Desired Trend:**

To be determined

#### **Data Source(s) and Methodology:**

The Lincoln MPO will track the number of completed projects subjected to life cycle cost analysis and encourage the City of Lincoln, Lancaster County, and NDOR to integrate this process into the alternatives analysis process.

Funding and Cost Effectiveness



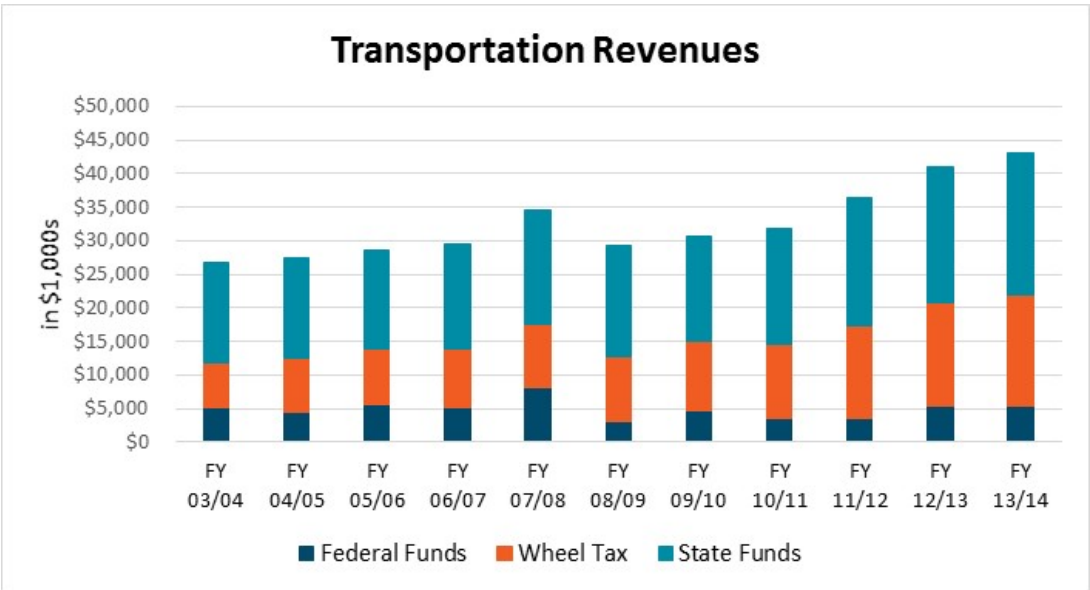
3 Annual funding for transportation projects

In the past, the primary source of funds for the nation’s streets was the federal gas tax. But, the federal gas tax has been stagnant for more than 20 years. In fact, Lincoln’s federal gas tax allocation has increased only \$46,000 over the last decade, while construction inflation has increased an average of 5 percent per year. Local and state initiatives have been a tremendous help in closing the gap in transportation funding.

Baseline Data:

Annual funding for transportation projects = \$43.0 million (FY 13/14)

Desired Trend:



Data Source(s) and Methodology:

City of Lincoln Public Works and Utilities Department