ITEM #AAMPO 1

DATE: 10-27-20

AMES AREA METROPOLITAN PLANNING ORGANIZATION (AAMPO)
TRANSPORTATION POLICY COMMITTEE ACTION FORM

SUBJECT: APPROVAL OF 2045 METROPOLITAN TRANSPORTATION PLAN "FORWARD 45"

BACKGROUND:

On July 14, 2020, the Ames Area MPO Policy Committee was given a presentation on the progress of the 2045 Metropolitan Transportation Plan (MTP). At that meeting, the MPO's consultant, HDR, reviewed the public input process for the plan, the "universe of alternatives" list of potential projects, and the performance measures (scoring criteria) for the plan.

On September 8, 2020, the Ames Area MPO Policy Committee was given a presentation from HDR that included the performance measures and resultant project scoring. An overview of the funding summary to show the estimated budget for the next 25 years of federally aided transportation improvements was shown. The Policy Committee had the opportunity to give direction to HDR and staff for any desired changes to the plan.

STATUS UPDATE:

The Draft 2045 MTP was presented to the Policy Committee and was approved on September 22, 2020. A 30-day public comment period then began following the Policy Committee meeting which was closed on October 22, 2020. All comments received from ublic and oversight/partner agencies were minor and were incorporated into the final document. See attachment for a list of all comments.

ALTERNATIVES:

1. Approve the Final 2045 Metropolitan Transportation Plan

2. Approve the Final 2045 Metropolitan Transportation Plan with Modifications

ADMINISTRATOR'S RECOMMENDED ACTION:

It is important to note that the development of the plan has followed Federal performance-based planning requirements. In following the Federally mandated MTP development process, these requirements provide a framework on how projects are included (or not) in the plan and the timing of those projects. Project prioritization must follow this framework and individual projects that rank lower through these performance measures cannot be randomly given a higher priority. Giving a project higher priority that is contrary to the performance-based ranking would violate Federal process causing the plan to be rejected.

The Final Metropolitan Transportation Plan addresses all received feedback since the approval of the draft document. Therefore, the Administrator recommends that the Transportation Policy Committee adopt Alternative No. 1 as described above.

Forward 2045 Metropolitan Transportation Plan

Ames Area Metropolitan Planning Organization

OCTOBER 27, 2020

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Introduction and Goals

Chapter 1 **Introduction and Goals**

Introduction

Ames Area Metropolitan Planning Organization

The Ames Area Metropolitan Planning Organization (AAMPO) is a federally-mandated organization that is responsible for the expenditures for transportation projects and programs that are based on a comprehensive, cooperative, and continuing planning process. AAMPO was designated as the MPO of the Ames urbanized area in 2003, when the population exceeded 50,000. Since its designation, the MPO has expanded it's boundary to include the City of Gilbert. The current MPO planning area, shown in **Figure 1-1**, was approved in 2012.

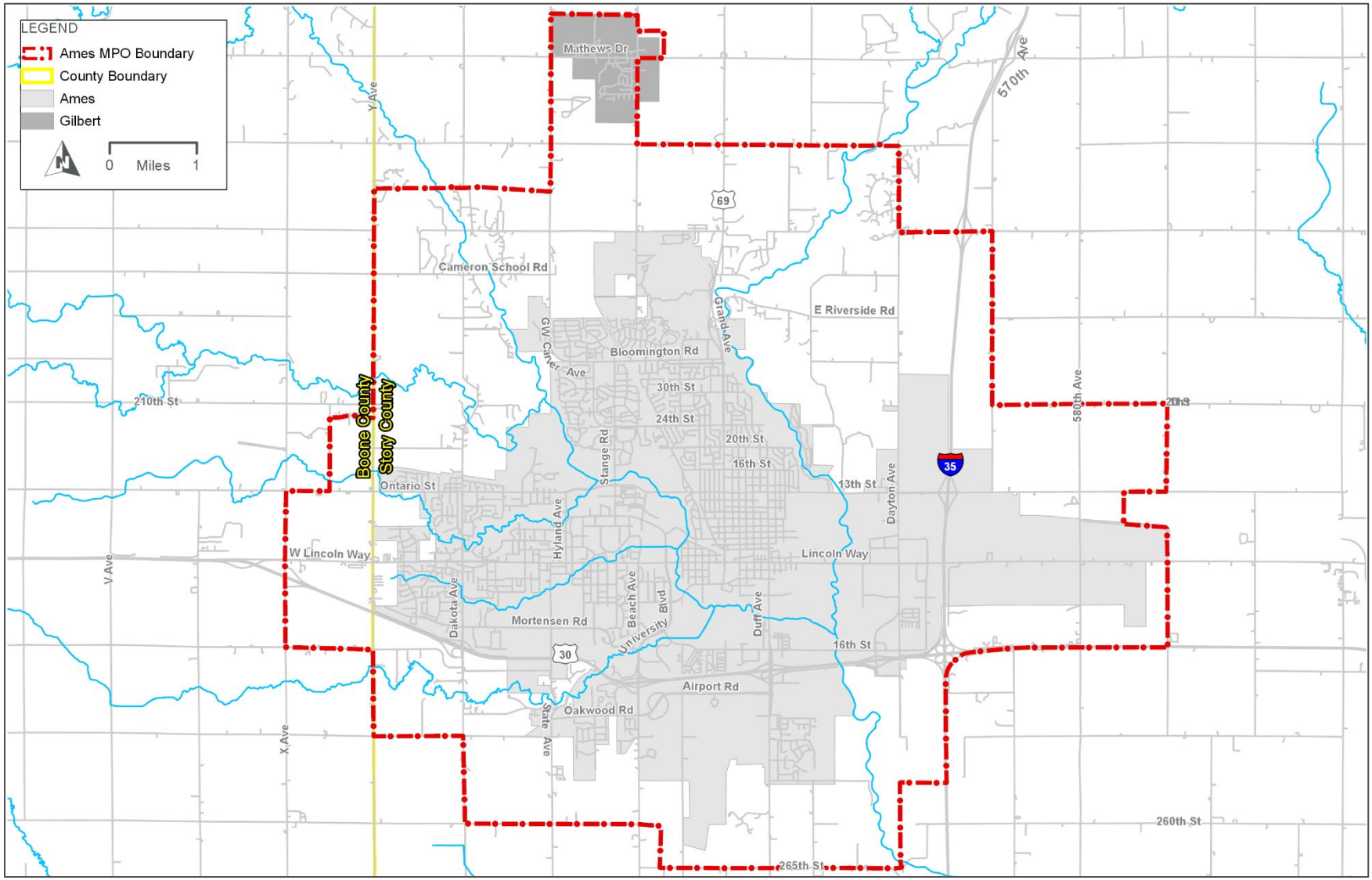
In addition to the Cities of Ames and Gilbert, there are seven other member jurisdictions comprising AAMPO:

- Story County
- Boone County
- CyRide (Ames transit agency)
- Iowa State University
- Iowa Department of Transportation
- Federal Highway Administration
- Federal Transit Administration

Two committees govern AAMPO:

- **Transportation Policy Committee (TPC)**: Provides policy direction for the development of regional long-range transportation planning and selects projects within the metropolitan area for inclusion in a short-range Transportation Improvement Program (TIP). The TPC consists of the City of Ames mayor and city council, Boone and Story County representatives, a CyRide representative, and a City of Gilbert Representative. Non-voting representatives from the Iowa Department of Transportation (DOT), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and Iowa State University are also TPC members.
- **Transportation Technical Committee (TTC)**: Serves as the technical advisory body to the TPC and consists of professionals representing various transportation-related agencies within the MPO area, including the City of Ames, Story and Boone Counties, Iowa DOT, FHWA, FTA, and Iowa State University.

Figure 1-1: AAMPO Planning Area



Metropolitan Transportation Plan

AAMPO is updating its Metropolitan Transportation Plan (MTP), Forward 2045. This Plan acts as the framework for guiding the MPO's transportation investments and policy decisions over the next 25 years by identifying a regional vision for the multi-modal transportation system through stakeholder and community input. Goals and objectives, based on this vision, were developed to articulate the actionable strategies available to the MPO for realizing this vision. Included in Forward 2045 is a prioritized list of multimodal system improvements that fit within the fiscal constraints of AAMPO based on anticipated future funding.

Performance-Based Planning

Forward 2045 is a performance-based document that supports AAMPO's continuing system performance goals and targets through the application of FWHA performance management techniques. These techniques are used to inform transportation investments and policy decisions that support national, state, and local transportation goals. Performance-based planning relies on the ongoing monitoring of the transportation system, which enables AAMPO to monitor the progress made towards its regional vision. Forward 2045 utilizes this performance-based approach and ties the regional vision for the transportation system to Federal planning requirements, the conditions of the existing system, and state and local agencies. Through the continual monitoring of the system, the AAMPO will be able to constantly gauge progress made towards the MTP goals and objectives.

The Forward 2045 Vision

The Vision Statement for Forward 2045 was developed early in the MTP process and was based on input given by the community during the Public Visioning Open House event (for more information on Forward 2045 public engagement, check out **Appendix A**).

Based on the input from community members, the vision statement for Forward 2045 is:

> *"The Ames area future transportation plan delivers **safe**, **efficient** and **reliable** solutions that are **accessible** to all users. The plan focuses on **preserving** the existing network and shaping the public realm through **placemaking**, while providing long-term **sustainability**."*

Related Planning Efforts

Ames Plan 2040 (Comprehensive Plan):

The Ames Plan 2040 serves as an update to the City of Ames' current Comprehensive Plan. Ames Plan 2040 will re-focus the City's vision for its land use planning and decision-making as the community seeks to manage anticipated growth through the year 2040. Under the unifying themes of Sustainability, Health, Choices, and Inclusivity, Ames Plan 2040 reinforces Forward 2045 through supporting the MTP's goals for a financially and environmentally sustainable future transportation system that provides safe and efficient multi-modal transportation operations.

AAMPO 2020-2024 Final Passenger Transportation Plan:

AAMPO's 2020-2024 Final Passenger Transportation Plan (PTP) was coordinated by the MPO with the purpose of enhancing transportation access throughout the MPO region by working to allocate public transportation resources in the most efficient manner possible, while meeting the needs of residents who rely on public transit. A major element of the PTP is the identification of public transit projects and strategies funded with Federal FTA funds, which are received by the MPO for disbursement to the public transit operators in the region.

CyRide Transit Asset Management Plan (TAM):

CyRide's TAM Plan outlines the structure in which asset management policy and goals address public transit equipment and facilities, as well as providing accountability and visibility for furthering the understanding of asset management practices to ensure the safe and reliable provision of public transit services. A major element of the TAM Plan is the identification and reporting of transit operations performance and performance targets for CyRide's bus fleet, equipment, and other public transit facilities per Federal requirement.

Complete Street Ames:

Complete Streets Ames formalizes a context-sensitive planning and design approach to developing a street network that is safer, more comfortable, and more useful for all modes. The plan shifts transportation priorities to be more encompassing of bicycle, pedestrians, and transit, guides design decisions, and increases consistency in transportation design. The Complete Streets Policy articulated in the Plan applies to all existing and future public roads, as well as transportation projects funded by Federal, state, and/or local sources. As such, projects presented in Forward 2045 and located with the boundaries of the City of Ames are subject to the Complete Streets Policy.

State Transportation Asset Management Plan (TAMP):

The Iowa DOT's TAMP seeks to identify the optimal strategies for managing existing transportation infrastructure through the most cost-effective approaches available. The TAMP inventories existing assets and presents a series of investment strategies based on the financial plan developed for the state's transportation assets. The goals of the TAMP include planning for the maintenance and expansion of the transportation system more cost-effectively, improving system performance, delivering to Iowa DOT customers the best value for each dollar spent, and enhancing Iowa DOT's credibility and accountability in stewardship of its transportation assets.

Strategic Highway Safety Plan (SHSP):

The Iowa DOT's SHSP is a statewide-coordinated plan providing a comprehensive framework for improving safety on public roads. The SHSP identifies goals, objectives, and emphasis areas for Federal, state, and local stakeholders to work towards the vision of Zero Fatalities.

Iowa State Freight Plan:

The Iowa DOT's State Freight Plan serves as a supplement to the state's long-range transportation plan, Iowa in Motion 2045. The State Freight Plan provides an in-depth overview of existing and future freight conditions, strategic goals and objectives for freight in Iowa, a freight system investment plan, and an outline of how the state's freight plan supports national economic goals related to freight.

Iowa In Motion 2045:

Iowa in Motion 2045 is the state's long-range transportation plan that addresses Federal requirements while presenting a statewide transportation financial and investment plan. The Plan is updated every 5 years so that trends, forecasts, and factors effecting the transportation system are current and best reflect the conditions of the state's system. Iowa In Motion 2045 sets the statewide perspective for planning efforts, which then shapes how MPOs and Regional Planning Affiliations shape their local planning efforts.

Forward 2045 Goals and Objectives

The transportation goals and objectives presented in the MTP guide the vision for how the future multi-modal system should operate while reflecting the values of the community. These goals and objectives were developed based on input received during the public engagement process, FAST-Act goal areas, and the Metropolitan Planning Factors set forth under 23 U.S.C 450.306(b)(1). **Table 1-1** shows the major goal areas and objectives that were identified for inclusion in this MTP.

Forward 2045 Goals and Federal Metropolitan Planning Factors

As part of the MTP update, AAMPO is federally-required to develop the plan through a performance-driven and outcome-based approach. To guide MPO's through a planning process that is continuous, cooperative, and comprehensive, 10 Metropolitan Planning Factors that must be met during the MTP were identified by Federal government under 23 CFR 450.306.[1] **Table 1-2** shows a matrix that illustrates how the six goal areas shown in Table 1-1 align with the Metropolitan Planning Factors listed below:

1. Support the economic vitality of the metropolitan area
2. Increase the safety of the transportation system for motorized and non-motorized users
3. Increase the security of the transportation system for motorized and non-motorized users
4. Increase the accessibility and mobility of people and freight
5. 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
6. Enhance the integration and connectivity of the transportation system across modes, for people and freight
7. Promote efficient system management and operation
8. Emphasize the preservation of the existing transportation system
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation
10. Enhance travel and tourism

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23 CFR § 450.306 - Scope of the metropolitan transportation planning process.

Table 1-1: Forward 2045 Goal Areas

Goal Area	Description
Accessible	The ease of connecting people to goods and services in the Ames area, as well as providing choices for different modes of transportation (i.e. car, bike, bus, etc.)
Safe	Reducing the risk of harm to users of the Ames transportation system
Sustainable	Reducing or eliminating negative environmental impacts from the Ames transportation system and promoting financially sustainable investments
Efficient & Reliable	Provide for the efficient and reliable movement of people, service, and goods
Placemaking	Integrating the transportation system with land use to create well-designed places and complete communities
Preservation	Maintain the exisiting transportation system in a state of good repair

Table 1-2: Forward 2045 Goals and Objectives Alignment with Federal Metropolitan Planning Factors

Goal	Objectives	Federal Planning Factors									
		1 - Economic Vitality	2 - Safety	3 - Security	4 - Accessitility and Mobility for People and Freight	5 - Environment and Energy Conservation, Quality of Life, Economic Development	6 - System Integration and Connectivity for People and Freight	7 - Efficient Operation and Management	8 - Preserve the Existing Transportation System	9 - System Resiliency and Reliability; Reduce or Mitigate Stormwater Impacts	10 - Enhance Travel and Tourism
Accessible											
	Improve walk, bike, and transit system connections				▲	▲	▲				▲
	Provide appropriate arterial and collector spacing				▲		▲	▲			
	Improve bicycle and pedestrian access to CyRide routes				▲	▲	▲				
	Provide improved access to transit for transit dependent, disabled, and disadvantaged populations				▲	▲	▲				
	Incorporate bicycle, pedestrian, and transit-friendly infrastructure in new developments				▲	▲	▲				
Safe											
	Reduce number and rate of crashes		▲								
	Reduce the number of bicycle and pedestrian crashes		▲								
	Reduce number and rate of serious injury and fatal crashes		▲								
	Identify strategies and projects that improve user safety for all modes		▲								
	Prioritize projects that improve the Ames Area Safe Routes to School Program		▲								
Sustainable											
	Reduce transportation impacts to natural resources					▲				▲	
	Make transportation infrastructure more resilient to natural and manmade events					▲				▲	
	Limit transportation system emissions of greenhouse gases					▲				▲	
	Promote financially sustainable transportation system investments	▲				▲				▲	
	Promote transportation decisions that follow State of Iowa Smart Planning Principles					▲				▲	

Table 1-2: Forward 2045 Goals and Objectives Alignment with Federal Metropolitan Planning Factors con't.

Goal	Objectives	Federal Planning Factors									
		1 - Economic Vitality	2 - Safety	3 - Security	4 - Accessitility and Mobility for People and Freight	5 - Environment and Energy Conservation, Quality of Life, Economic Development	6 - System Integration and Connectivity for People and Freight	7 - Efficient Operation and Management	8 - Preserve the Existing Transportation System	9 - System Resiliency and Reliability; Reduce or Mitigate Stormwater Impacts	10 - Enhance Travel and Tourism
Efficient and Reliable											
	Identify context-sensitive strategies and projects that improve traffic flow in corridors with high levels of peak period congestion.				▲			▲			
	Maintain acceptable travel reliability on Interstate and principal arterial roadways				▲			▲			
	Provide frequent transit service to high trip generation locations				▲	▲		▲			
	Increase the regional share of trips made by walking, biking, and transit							▲			
	Improve freight system reliability	▲			▲			▲			
	Identify technology solutions to enhance system operation			▲	▲		▲	▲			
Placemaking											
	Provide transportation strategies and infrastructure that support current adopted plans				▲	▲	▲				
	Increase the percentage of population and employment within close proximity to transit and/or walking and biking system	▲				▲					
	Provide transportation investments that fit within their context			▲			▲				
	Connect activity centers and adjoining developments with complete streets	▲			▲	▲	▲				▲
Preservation											
	Maintain NHS routes in good condition while minimizing routes in poor condition								▲		
	Maintain NHS bridges in good condition while minimizing bridges in poor condition								▲		

Chapter 2
Regional Trends

Chapter 2 **Regional Trends**

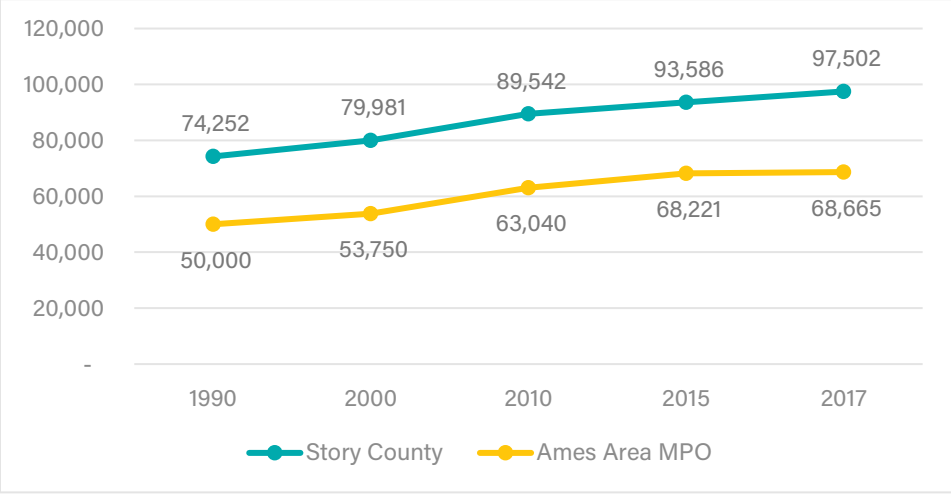
As the Ames area continues to grow, the accompanying demographic changes could have substantial influence on how the regional transportation system operates in the future. Continued shifts in population and employment could exacerbate the need to provide a variety of modal options that match the needs of all residents living and working in the region. This chapter provides an overview of the historical population and employment trends in the region as well as a snapshot of the current demographic profile of the Ames Urbanized Area.

Historical Regional Trends

Historic Population and Employment Growth Trends

Population levels in the Ames Area increased from an estimated 50,000 in 1990 to over 68,000 in 2017. During this same time period, the population of Story County increased by nearly 25,000 people, as shown in **Figure 2-1**.

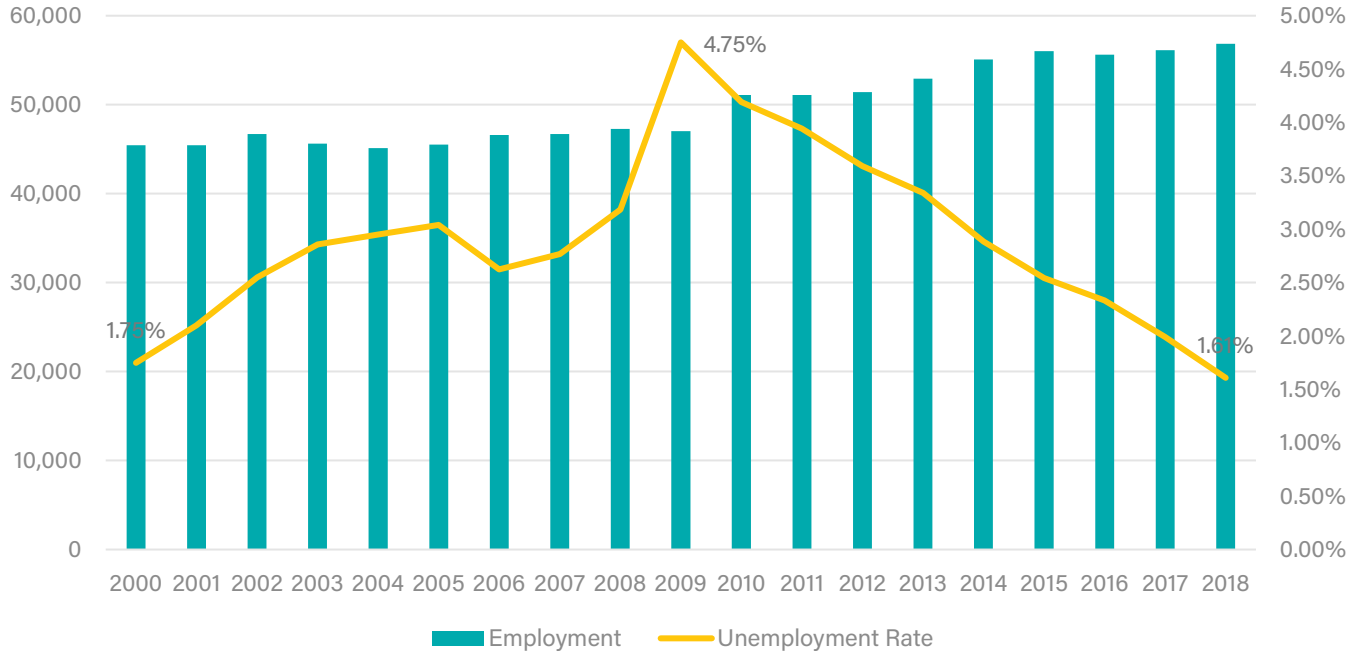
Figure 2-1: Historical Population Growth for the AAMPO Region and Story County*



Source: US Census Bureau, Woods and Poole, HDR
**A small portion of Boone County falls within the MPO planning area*

Employment in the Ames Metropolitan Statistical Area experienced steady growth between 2000 and 2018, while the unemployment rate peaked at 4.75% in 2009 before declining to 1.61% in 2018. **Figure 2-2** displays the employment and unemployment rate trends during this 19-year period.

Figure 2-2: Employment and Unemployment Rates for the Ames Metropolitan Statistical Area, 2000-2018

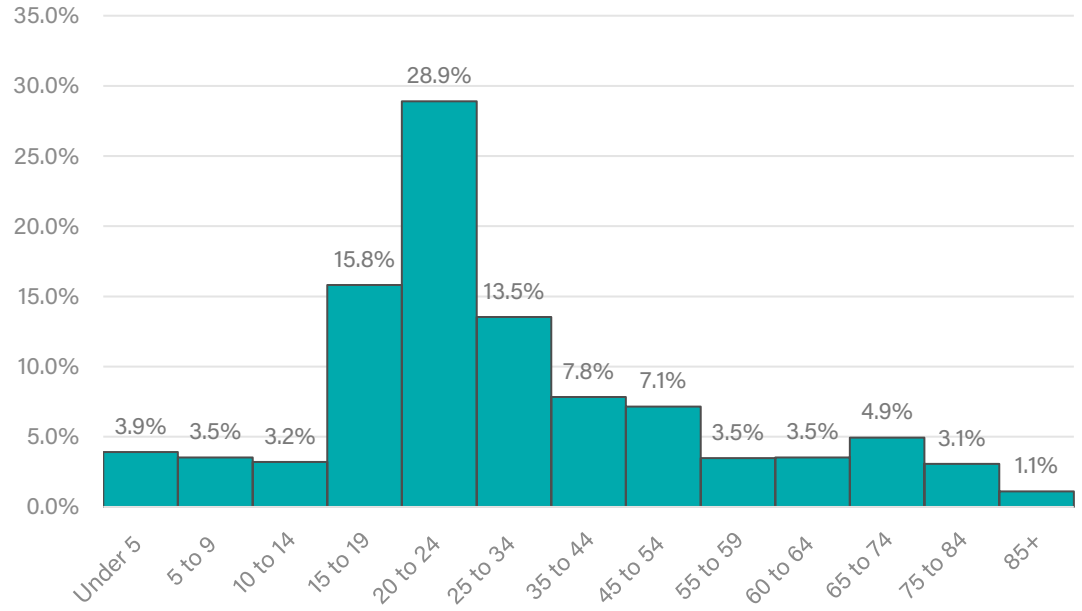


Source: ACS 2013-2017 5-Year Estimates

Current Demographics

The population for the Ames Urbanized Area is estimated to be 66,511, which is an increase of roughly 6,000 people since the year 2010. The median age of Ames Area residents is 23 years old, which reflects the largest share of residents, 28.9%, that comprise the age range of 20 to 24. **Figure 2-3** below presents the proportion of Ames residents by age group. Being home to Iowa State University (ISU), the City of Ames has a significant portion of its population who are students as enrollment at ISU in the year 2017 totaled 35,993. This population distribution results in unique challenges and needs for AAMPO to address in its transportation planning processes.

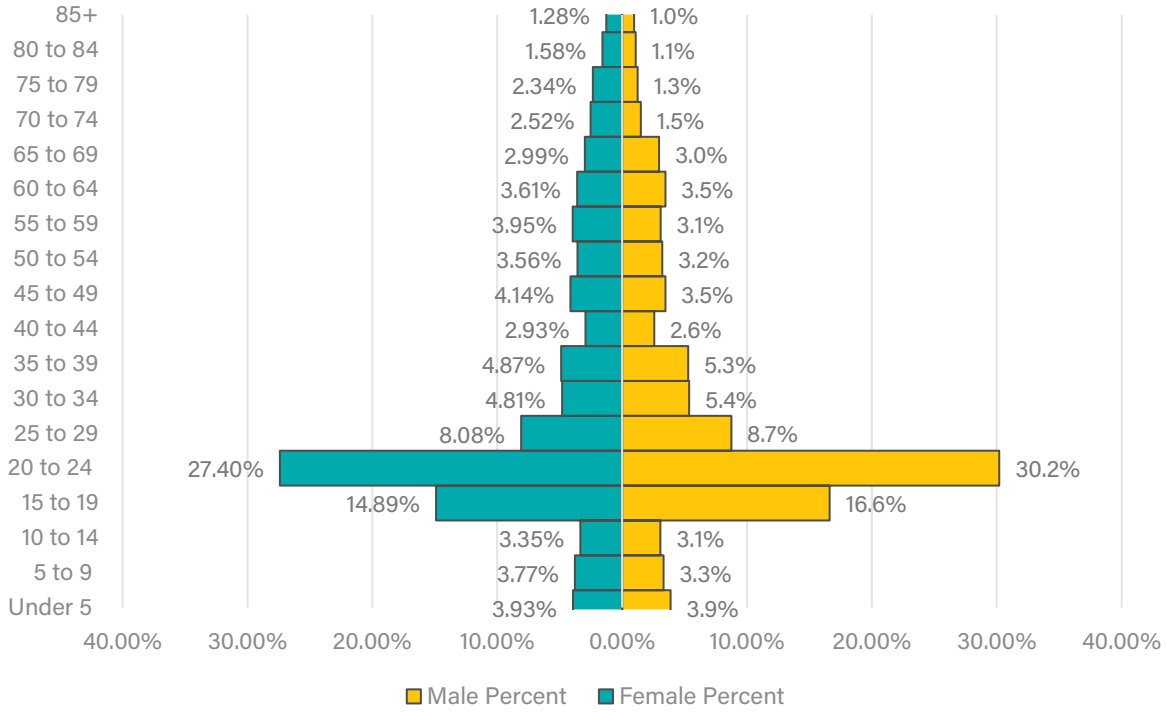
Figure 2-3. Population Cohorts by Age, Ames Urbanized Area



Source: ACS 2013-2017 5-Year Estimates

Males make up 53.4% of the Ames Urbanized Area population while 46.6% are female. As previously mentioned, the largest age group of residents is 20 years to 24 years; 27.4% of the male population falls into this age range while 30.2% of females are between 20 and 24 years. 14.9% of males in the Ames Urbanized Area are aged 15 to 19 years while 16.6% of females are in this age cohort. **Figure 2-4** illustrates the population pyramid for the Ames Urbanized Area.

Figure 2-4. Population Pyramid, Ames Urbanized Area



Source: ACS 2013-2017 5-Year Estimates

As shown in **Table 2-1**, 83% of the Ames Urbanized Area population identifies as White or Caucasian while 10% identifies as Asian. Hispanic or Latino residents comprise 3.4% of the population while 2.6% identifies as Black or African American. **Table 2-2** contains the number households with limited English-speaking proficiency by language spoken at home.

Table 2-1: Population of Ames Urbanized Area by Race

Race	People	Percent
White	55,234	83.04%
Black or African American	1,737	2.61%
Asian	6,719	10.10%
Hispanic or Latino	2,281	3.43%
American Indian or Alaska Native	157	0.24%
Native Hawaiian or Pacific Islander	43	0.06%
Other	336	0.51%

Source: ACS 2013-2017 5-Year Estimates

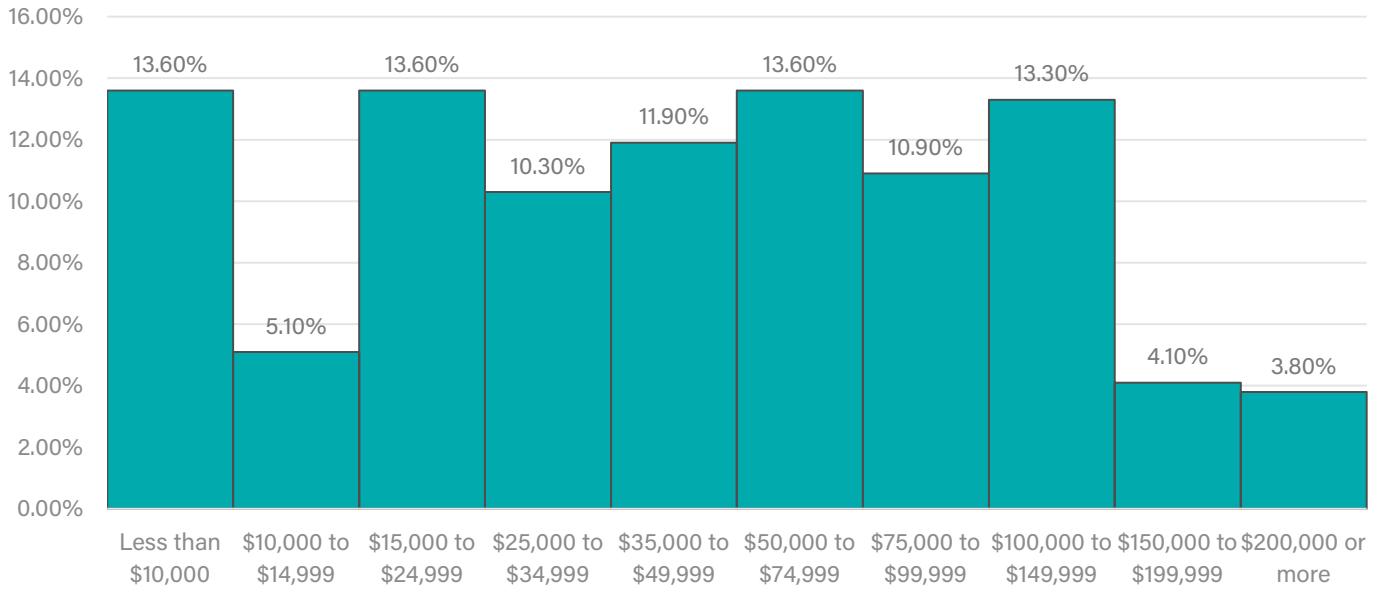
Table 2-2: Households with Limited English-Speaking Proficiency

Language Spoken	Number of Households	Percent
Limited English-speaking households-Spanish	37	0.14%
Limited English-speaking households-Other Indo-European languages	32	0.12%
Limited English-speaking households-Asian and Pacific Island languages	1,025	3.98%
Limited English-speaking households-Other languages	116	0.45%

Source: ACS 2013-2017 5-Year Estimates

The median household income for Ames residents in 2017 dollars is $43,214, while the median family income is $85,833. **Figure 2-5** shows the proportion of Ames households by 2017 income. Percentages of age cohorts living below the poverty level are shown in **Table 2-3.**

Figure 2-5: Household Incomes of Residents in the Ames Urbanized Area



Source: ACS 2013-2017 5-Year Estimates

Table 2-3: Percent of Households Living Below the Poverty Level

Age Cohort	Population for whom poverty status is determined	Percent below poverty level
Under 18 years	8,049	9.1%
18 to 64 years	43,026	36%
65 years and over	5,876	3.2%

Source: ACS 2013-2017 5-Year Estimates

41% of individuals employed in the Ames Urbanized Area are employed in the educational services, health care, and social assistance industry. The second highest share of Ames workers are employed in the arts, entertainment, and recreation, and accommodation and food services industry. The smallest share of Ames workers are employed in the wholesale trade industry. **Table 2-4** summarizes occupation by industry for the Ames Urbanized Area.

Table 2-4: Occupation by Industry for the Ames Urbanized Area

Industry	Percent
Agriculture, forestry, fishing and hunting, and mining	1.79%
Construction	3.81%
Manufacturing	8.29%
Wholesale trade	1.40%
Retail trade	9.69%
Transportation and warehousing, and utilities	1.89%
Information	1.75%
Finance and insurance, and real estate and rental and leasing	3.68%
Professional, scientific, and management, and administrative and waste management services	7.84%
Educational services, and health care and social assistance	41.12%
Arts, entertainment, and recreation, and accommodation and food services	11.85%
Other services, except public administration	3.20%
Public administration	3.69%

Source: ACS 2013-2017 5-Year Estimates

69% of workers aged 16 years or older commute to work alone in a private vehicle. Walking and the use of public transit (excluding taxi cabs) are used for commuting purposes at much higher rates when compared to the proportions of United States residents who use these modes for commuting; the ACS 2017 5-Year data indicate that 9.6% of Ames residents walk to work while 8.1% use public transit. For the national share of walking and public transit commuters, these figures are 2.7% and 5.1%, respectively. **Table 2-5** summarizes the means of transportation to work for both Ames Area residents and national averages.

Table 2-5: Means to Work for Residents of the Ames Urbanized Area

Means to Work	Ames Urbanized Area	United States
Drove Alone	69.1%	76.4%
Carpool	5.3%	9.2%
Public Transportation (excluding taxi)	8.1%	5.1%
Walk	9.6%	2.7%
Bike	3.3%	0.6%
Taxi, Motorcycle, or Other Means	0.6%	1.2%
Work from Home	4.0%	4.7%

Source: ACS 2013-2017 5-Year Estimates

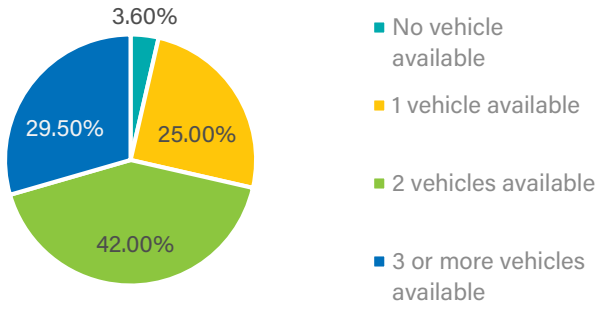
For over half of the workers in the Ames Urbanized Area, it takes less than 15 minutes for their daily commute to work, while approximately three-quarters of Ames residents have a commute that takes less than 20 minutes. **Table 2-6** summarizes travel times to work for Ames commuters. Additional data related to commuting trends in the Ames Urbanized Area show that 42% households have 2 vehicles available while 29.5% have three or more available, as seen in **Figure 2-6.**

Table 2-6: Travel Time to Work for Ames Urbanized Area Residents

Travel Time to Work	Ames Urbanized Area
Less than 10 minutes	24.60%
10 to 14 minutes	28.70%
15 to 19 minutes	20.60%
20 to 24 minutes	9.10%
25 to 29 minutes	2.00%
30 to 34 minutes	3.70%
35 to 44 minutes	3.40%
45 to 59 minutes	5.90%
60 or more minutes	2.00%

Source: ACS 2013-2017 5-Year Estimates

Figure 2-6: Household Car Ownership, Ames Urbanized Area



Socioeconomic Conditions and Transportation Planning in the AAMPO Region

The socioeconomic characteristics of Ames area residents impact current and future transportation needs and demands in the AAMPO region. Transportation costs can be a large portion of typical household expenses, so understanding the socioeconomic conditions of AAMPO area residents informs the required modal balance of transportation needs. From an equity perspective, economically disadvantaged residents are often more reliant on transit, bicycling, and/or walking for their daily work or school trips to meet their mobility needs. Additionally, the high student population is more transit-dependent, due the relative concentration of their trip destinations on the ISU campus and limited parking and student car ownership as illustrated below.

A comparison of regional commuting patterns for fixed-route transit usage between the student and non-student population for work commutes is shown in **Table 2-7**. The comparison was based on the Public Use Microdata (PUMAS) program administered by the U.S. Census Bureau for Story and Boone Counties. According the to the PUMAS data, roughly 14.5% of students use transit to reach their place of employment while only 1.5% of non-student workers commute via transit**.**

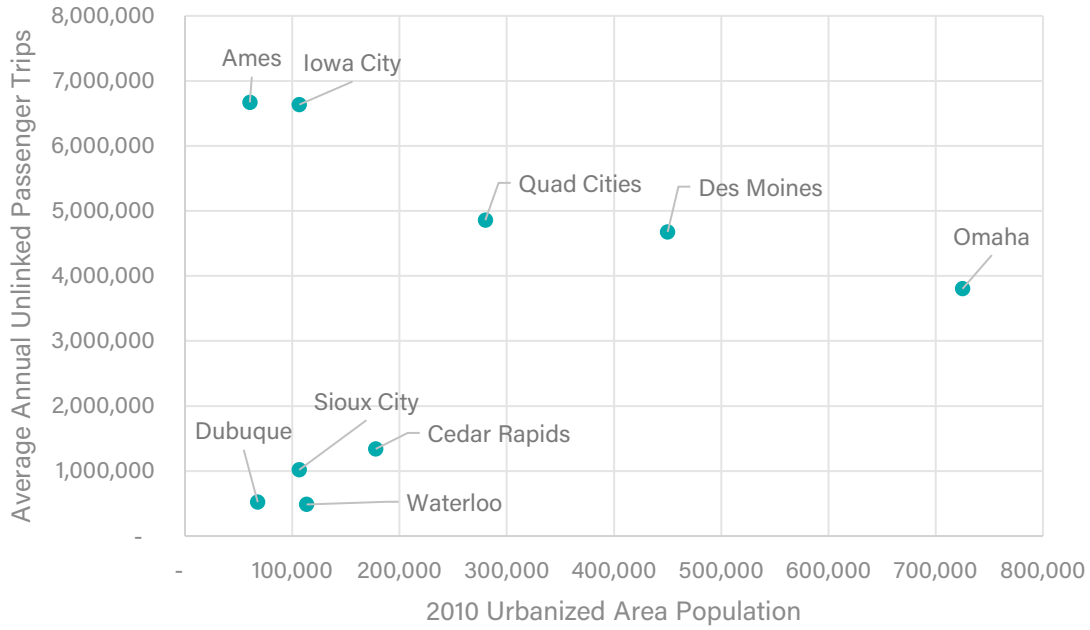
Table 2-7: Student vs. Non-Student Transit Usage for Commuting

Commute Mode	Students	Non-Students
Transit commuters	2,376	656
Non-Transit commuters	13,945	45,683
Total Commuters	16,321	46,339
Percent Transit Commuters	14.6%	1.4%

Source: Public Use Microdata, 2018

Comparing fixed route transit usage between AAMPO's CyRide system with transit systems for Iowa's other major metropolitan areas highlights the importance of this mode for residents, especially the student population, within the region. As **Figure 2-7** shows, CyRide's average annual fixed route passenger trip level was the highest among all other public transit providers in the state during the years 2014-2018. Iowa City's transit provider recorded a similar level of fixed route trips during this time period; similar to Ames, the City of Iowa City is home to a large student population who rely on fixed route transit.

Figure 2-7: Average Fixed Route Trips for Iowa's Public Transit Providers, 2014-2018



Source: National Transit Database

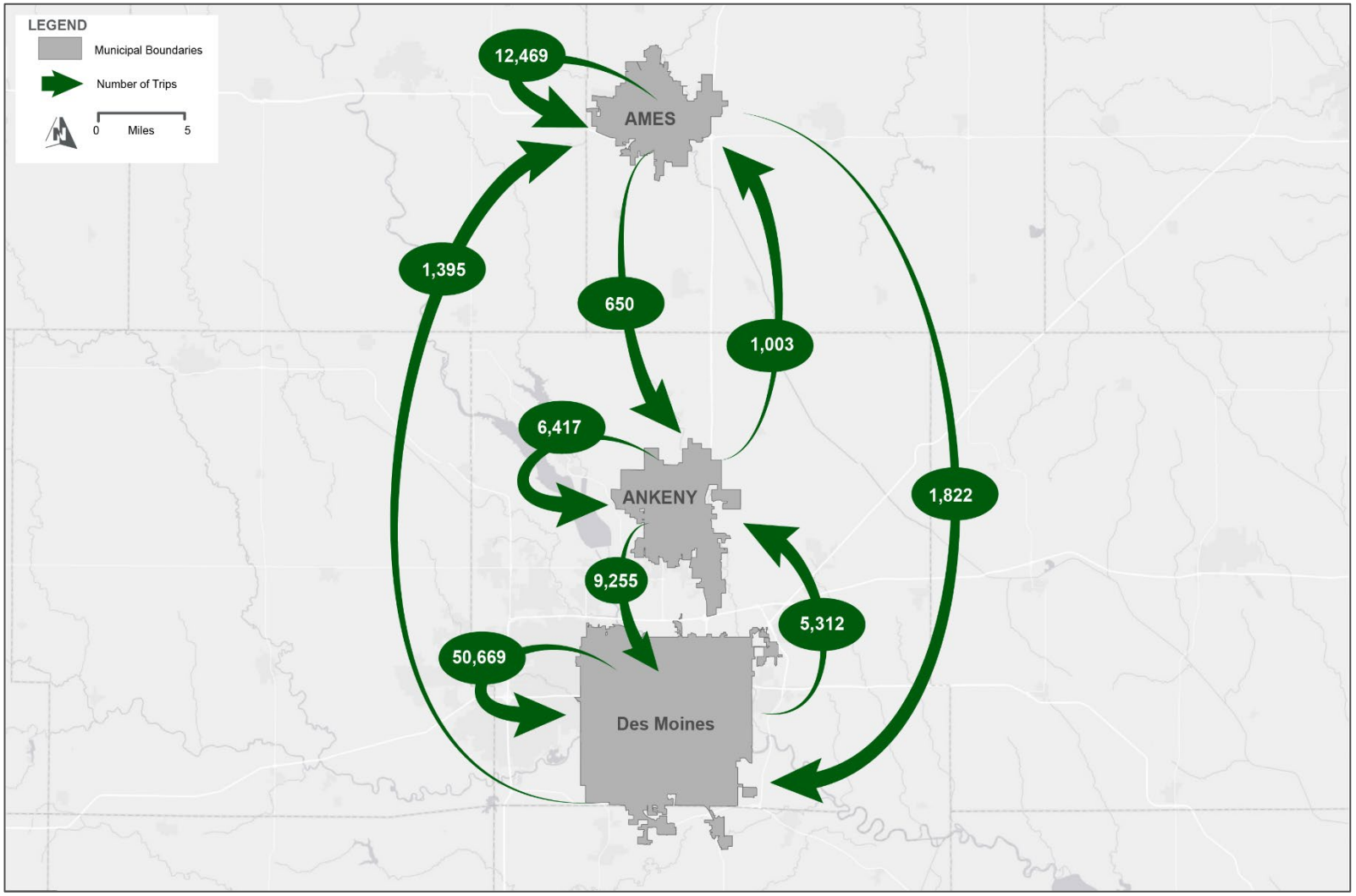
Inter-City Commute Patterns

Inter-city commute patterns were obtained from the United States Census Bureau's Longitudinal Household-Employer Dynamics (LEHD) Program, which compiles Federal, State, and Census Bureau data on employers and employees to allow for more detailed information pertaining to local economies.[2] LEHD data for the Cities of Ames, Ankeny, and Des Moines were reviewed to identify inter-city commuting patterns between these metropolitan areas located along the Interstate 35 Corridor.

As seen in **Figure 2-8**, the LEHD data indicates that the largest number of trips occurs within the boundaries of Des Moines, Ames, and Ankeny. The city with the largest flow of inbound travel is Des Moines, likely due to its higher population and greater concentration of economic and educational opportunities. Significant flow occurs along the Ankeny-Des Moines segment in both directions. The Ankeny-Des Moines segment sees between 1,300-1,800 commuters and the Ankeny-Ames segment sees between 600-1,000.

[2] United States Census Bureau. Longitudinal Household-Employer Dynamics Program. https://lehd.ces.census.gov/

Figure 2-8: Regional Commuting Patterns



Chapter 3
Existing System Performance

Chapter 3 **Existing System Performance**

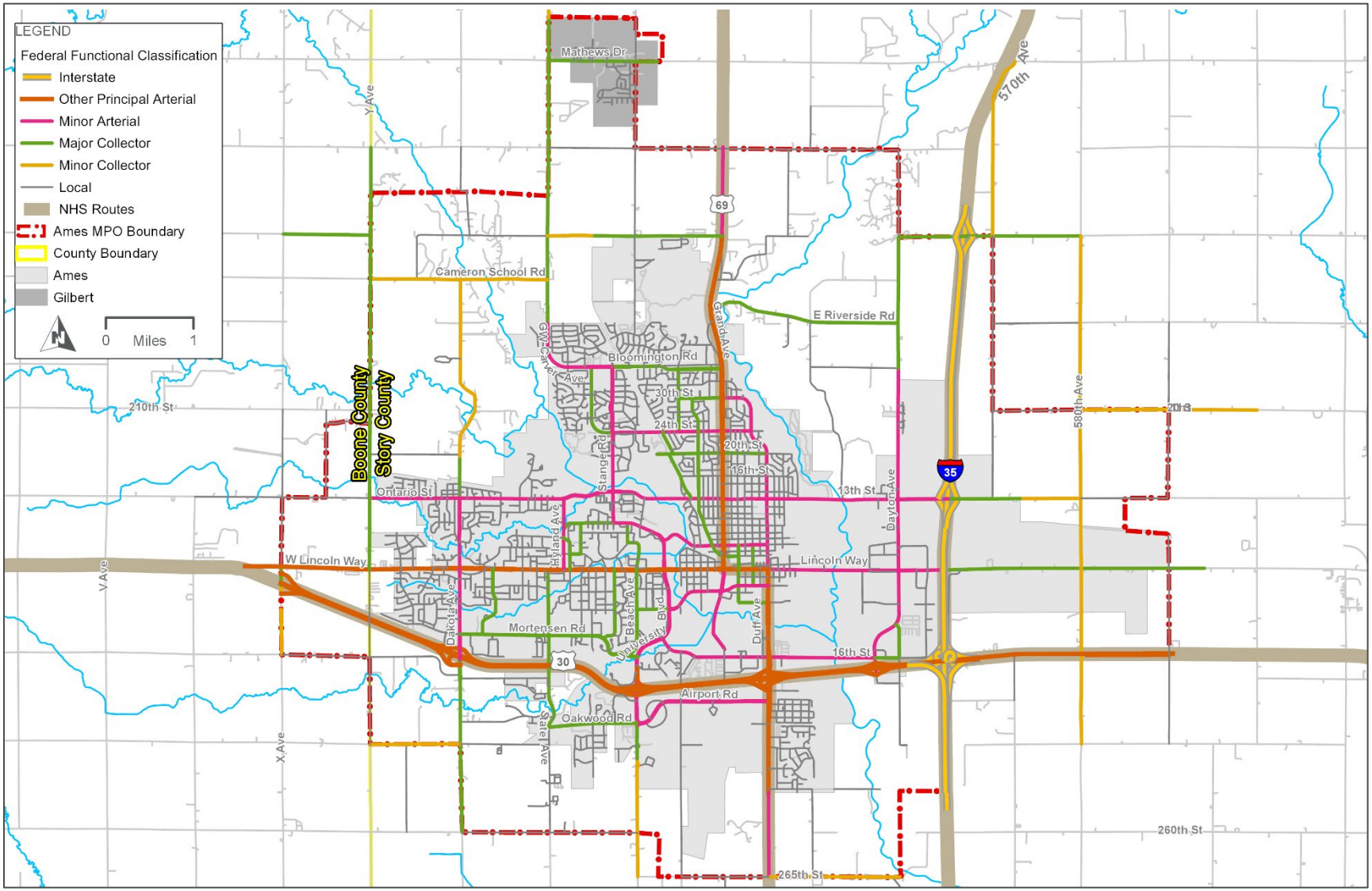
Roadway System Conditions

The evaluation of traffic operations, including peak period congestion, travel reliability, and bridge and pavement conditions was conducted to assess the existing conditions of the AAMPO roadway system.

Roadway Classifications

Roadways within the Ames Area MPO boundary are classified according to a Federal functional classification system developed by the Federal Highway Administration (FHWA). This system is used to determine which roads are eligible for federal transportation funds. The functional classifications for AAMPO roadways are presented in **Figure 3-1**.

Figure 3-1: Functional Classifications for the AAMPO Roadways



Traffic Operations

Existing traffic operations were reviewed from two different perspectives:

- Peak period travel conditions
- Passenger and freight travel reliability

Peak Period Traffic Operations

Peak period travel conditions focused on evaluating congestion levels during typical peak period conditions. These travel conditions are described using a standard vehicular Level of Service (LOS) classification that ranges from A, or free flow traffic, to F, or complete gridlock. **Figure 3-2** provides a definition for each LOS category.

Figure 3-2: Level of Service Definitions

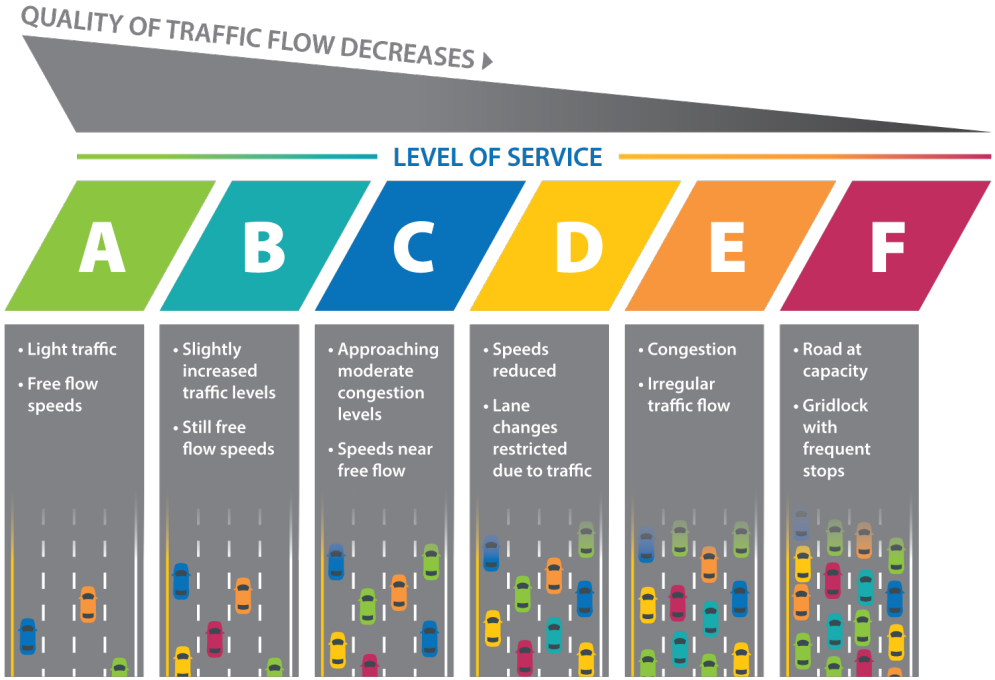
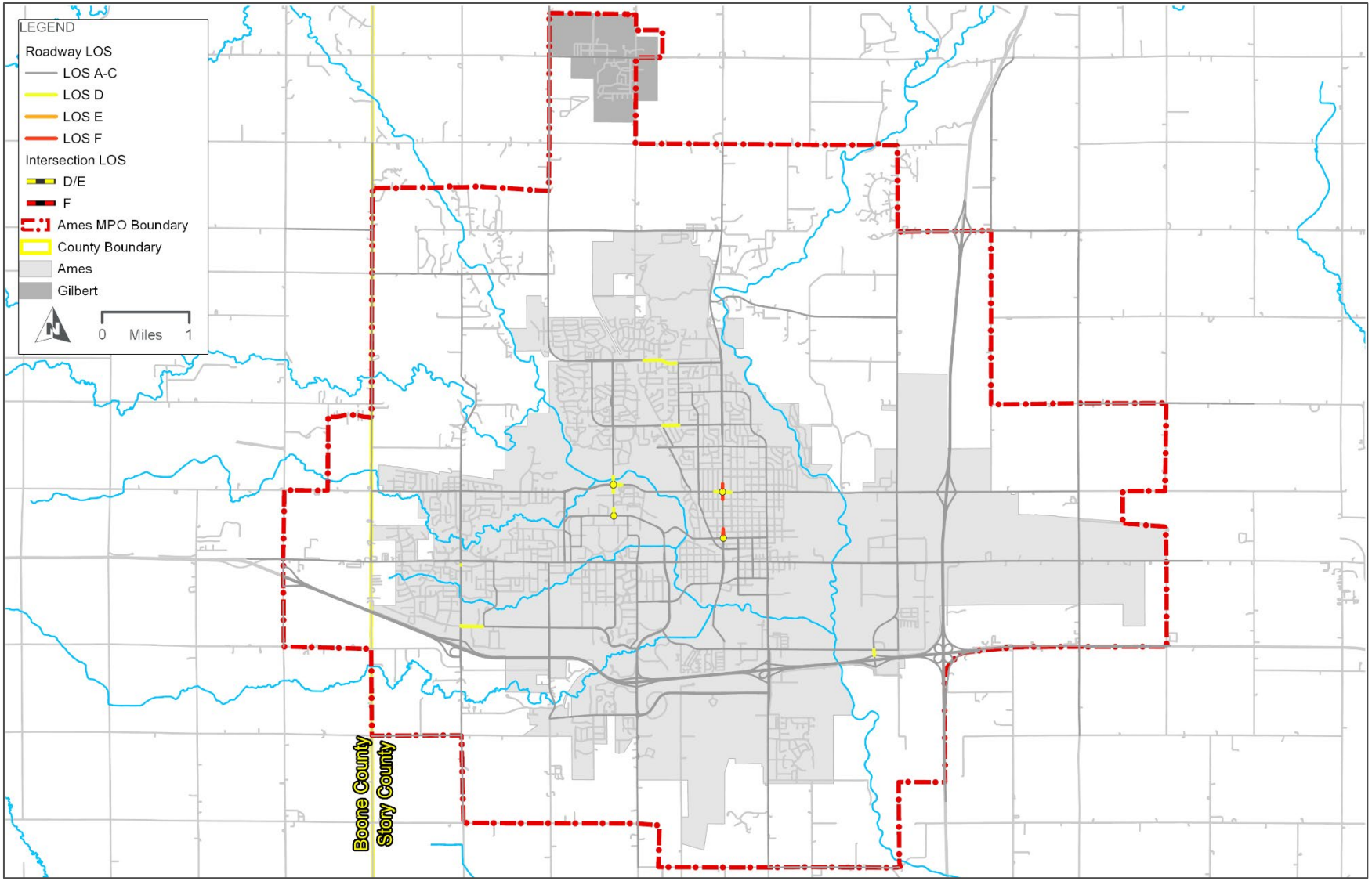


Figure 3-3 shows the existing peak period traffic operations for AAMPO.

Figure 3-3: Existing Peak Period Traffic Operations



For the existing AAMPO roadway system, over 98% of functionally-classified roads are operating at LOS C or better as shown in **Table 3-1**. Just over 1% are operating at LOS D, while less than half of one percent are operating at LOS F. The peak period traffic operations analysis demonstrates that the MPO's existing roadway system operates well during the peak period and congestion throughout the region is limited.

Table 3-1: Summary of Functionally-Classified Roads by Peak Hour Level of Service

Level of Service	Percent of Lane Miles
LOS A/B/C	98.5%
LOS D	1.1%
LOS E	0.0%
LOS F	0.4%

Travel Reliability

Passenger Vehicle Travel Reliability

Travel reliability looks at how predictable travel times are for passenger vehicles and freight trucks in a corridor. The metric used to describe travel reliability for passenger vehicles is Level of Travel Time Reliability (LOTTR) and is used only for corridors located on the NHS.

Within the AAMPO region, the least reliable corridors are:

- **Duff Avenue**: From Lincoln Way to 265th Street
- **Lincoln Way**: From Grand Avenue to S Dayton Avenue
- **Grand Avenue**: From 170th Street to 30th Street / Duff Avenue

In 2017 and 2018, 100% of the Interstate segments were considered reliable. The AAMPO non-Interstate NHS contained unreliable road segments during this same period, but saw improvement between 2017 and 2018. For the non-Interstate NHS, the annual percentage of person-miles traveled that are reliable were 87.8% in 2017 and 96.6% in 2018. **Figure 3-5** shows the LOTTR for all NHS routes in the AAMPO area.

Freight Travel Reliability

A metric similar to LOTTR is used to describe highway freight reliability in a corridor. This metric is referred to as Truck Travel Time Reliability Index (TTTR); only Interstate routes are analyzed for TTTR. The most recent data for highway freight travel reliability indicates that the AAMPO region does not have any unreliable corridors for highway freight travel, as all TTTR levels recorded were below the target of 1.5. In 2017, the average regional TTTR was 1.10 and rose to 1.12 in 2018. TTTR peaked slightly during the winter months of 2017-2018, but was still well below 1.5 as seen in **Figure 3-4**. For reference, the values 0.0 through 1.5 pertain to TTTR levels. Lower values represent higher reliability, and any TTTR over 1.5 would be considered an unreliable corridor.

Figure 3-4: Monthly TTTR for the AAMPO Region, 2017-2018

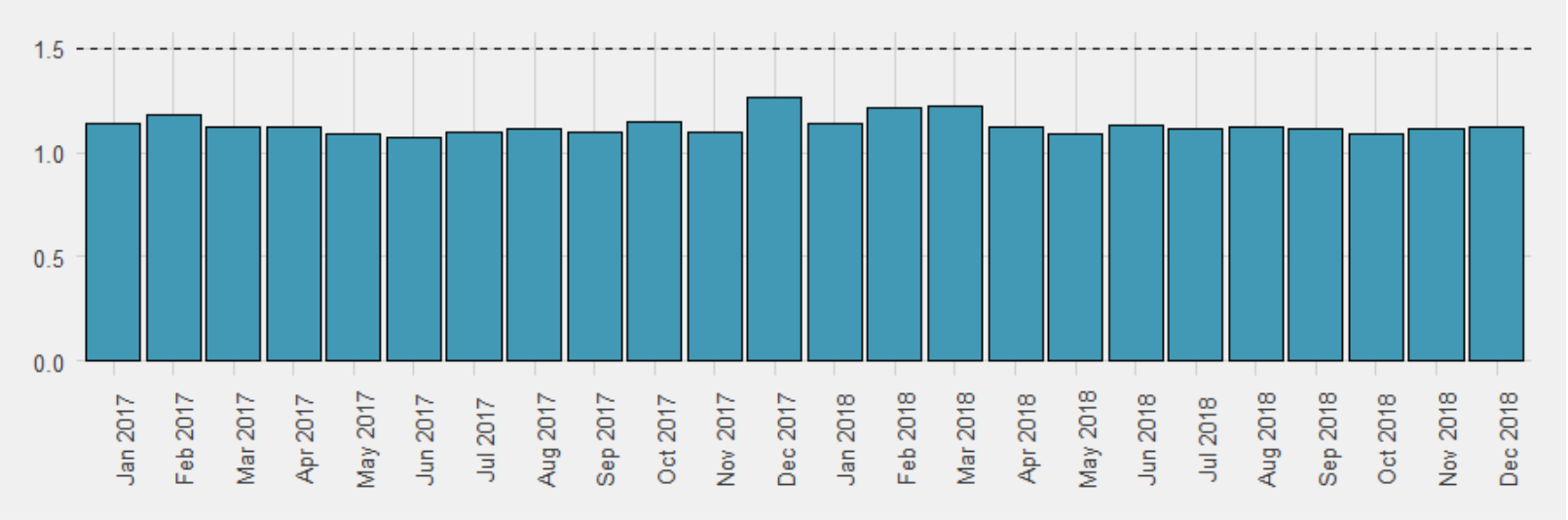
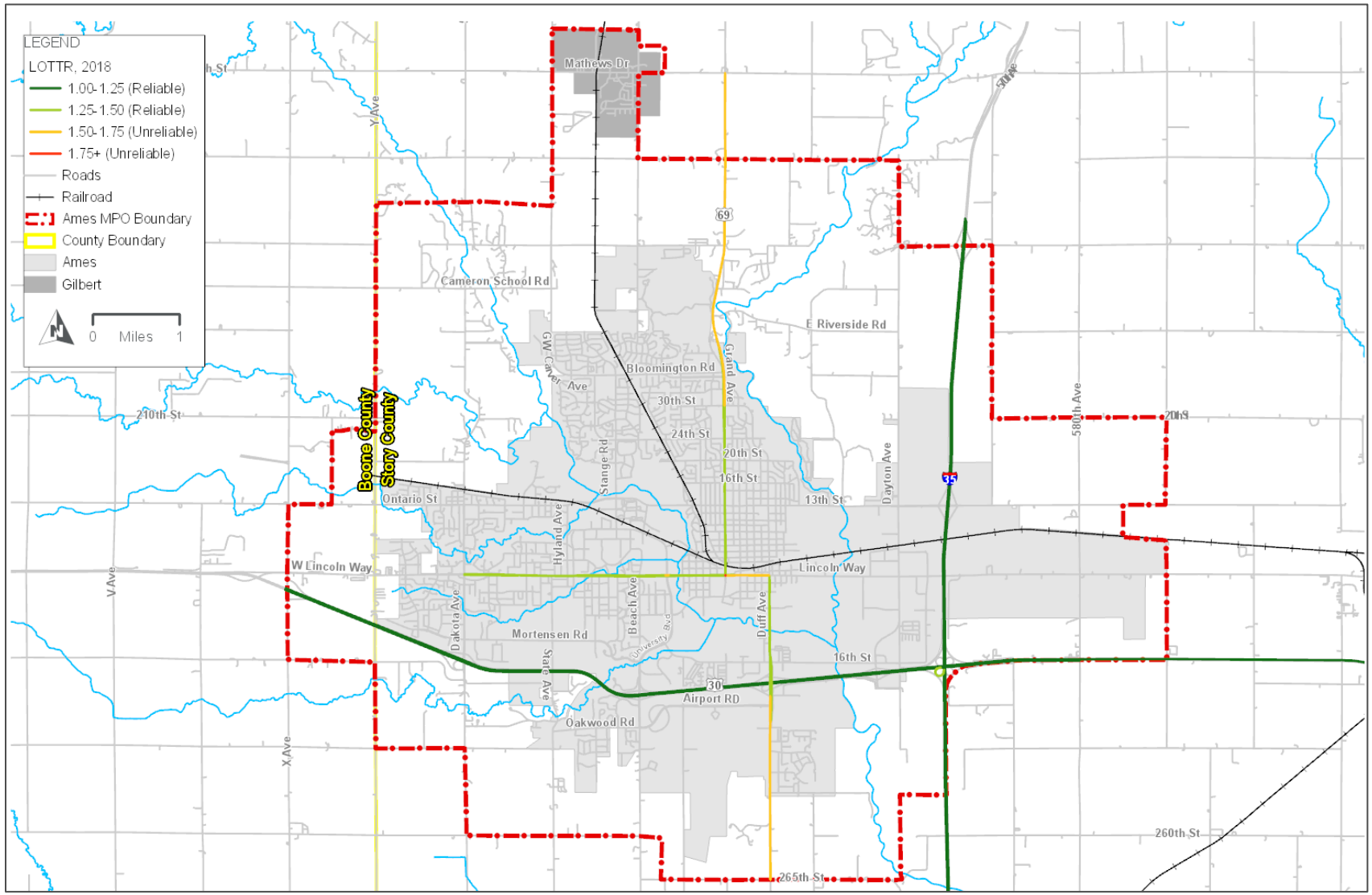


Figure 3-5: Passenger Vehicle Travel Reliability, 2018



System Condition

AAMPO Bridge Conditions

There are 58 bridges in the AAMPO boundary, and 20 of these structures are located on the NHS. **Table 3-2** presents the condition of all bridges in the AAMPO region, as well as the condition of NHS structures.

For AAMPO bridges, most are in Fair condition, 37, while 2 bridges are in Poor condition and the remaining 19 reported as being in Good condition. The locations of the bridges rated as Poor are:

- **W 190th Street**: Northwest of Ames, over Squaw Creek
- **Ken Maril Road**: Southeast Ames, over the Skunk River

Figure 3-6 shows AAMPO bridges and their conditions.

Table 3-2: Condition of AAMPO Bridges

Bridge Ratings	Interstate and non-Interstate NHS Bridges	All AAMPO Bridges
Good	4	19
Fair	16	37
Poor	0	2

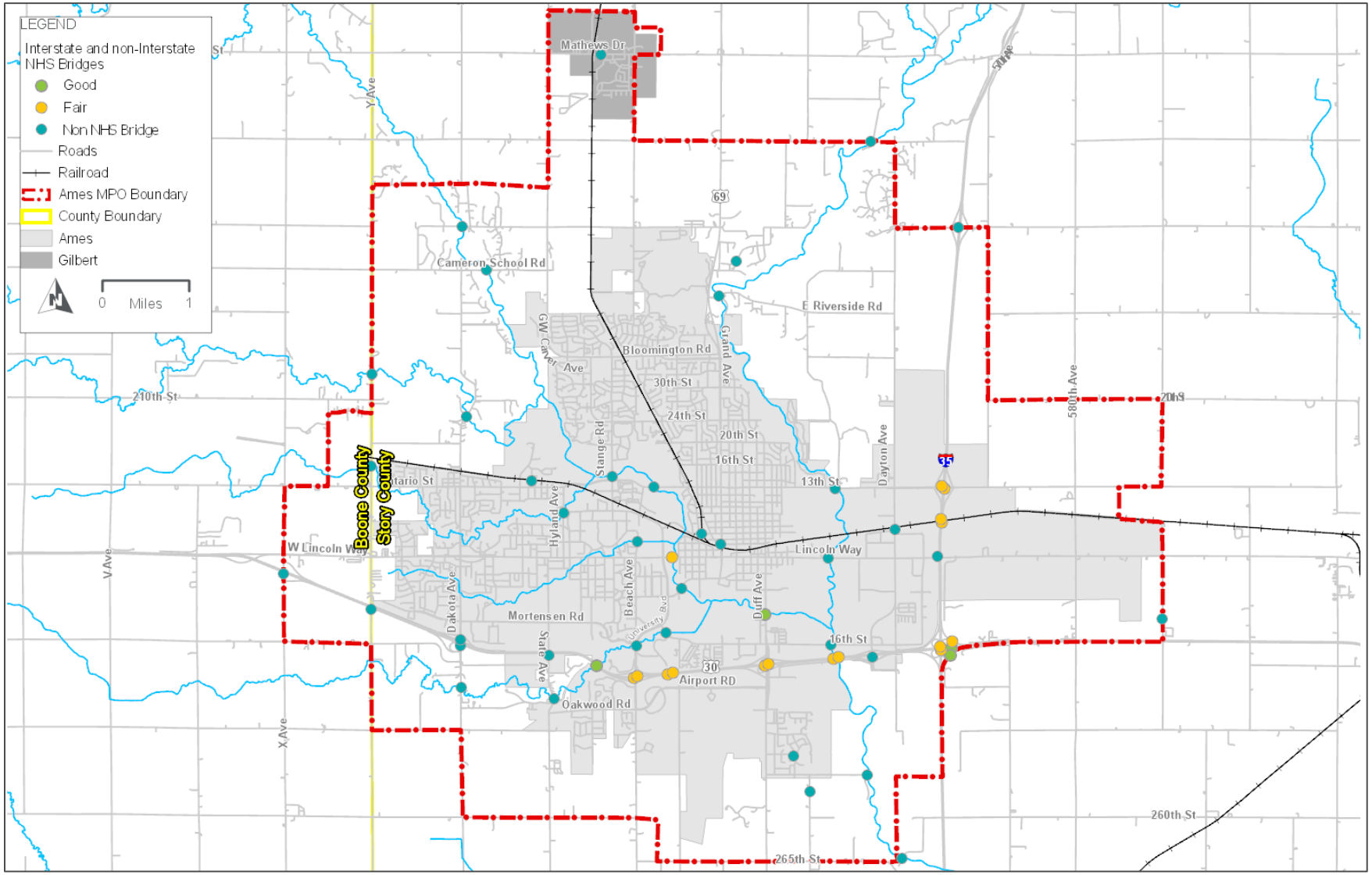
Source: National Bridge Inventory

Table 3-3 displays conditions of Interstate and non-Interstate NHS bridges as well as non-NHS bridge by deck area (in square meters). For those bridges located on the Interstate or non-Interstate NHS, 15% of total deck area is rated as being in Good condition while the remaining 85% of total deck area is classified as being in Fair condition. For all AAMPO bridges, a greater share of the total deck area is rated as being in Good condition while roughly 2/3rds of the total deck area is in Fair condition. The two bridges in Poor condition, as identified above, make up 1% of the total deck area.

Table 3-3: AAMPO Bridge Condition by Total Deck Area

Bridge Rating	Interstate and non-Interstate NHS Bridges	% of Total Deck Area	All AAMPO Bridges	% of Total Deck Area
Good	2,239.93	15%	12,201.61	31%
Fair	13,131.21	85%	26,533.33	68%
Poor	-		463.65	1%
Total	15,371.14		39,198.59	

Figure 3-6: AAMPO Bridge Locations



AAMPO Pavement

The majority of pavement in the AAMPO region is in Fair or Good condition, as shown in **Table 3-4** and **Table 3-5**. For NHS routes, only 4% of pavement is in Poor condition while the remaining pavement is in Fair condition or better.

Table 3-4: Pavement Condition Ratings for Non-Interstate, Non-NHS Roads

Functional Classification	Pavement Condition Rating (CityPCI)		
	Poor	Fair	Good
Collector	13%	46%	41%
Local	22%	49%	28%
Minor Arterial	17%	25%	58%
Principal Arterial	24%	31%	45%
Total	21%	45%	35%

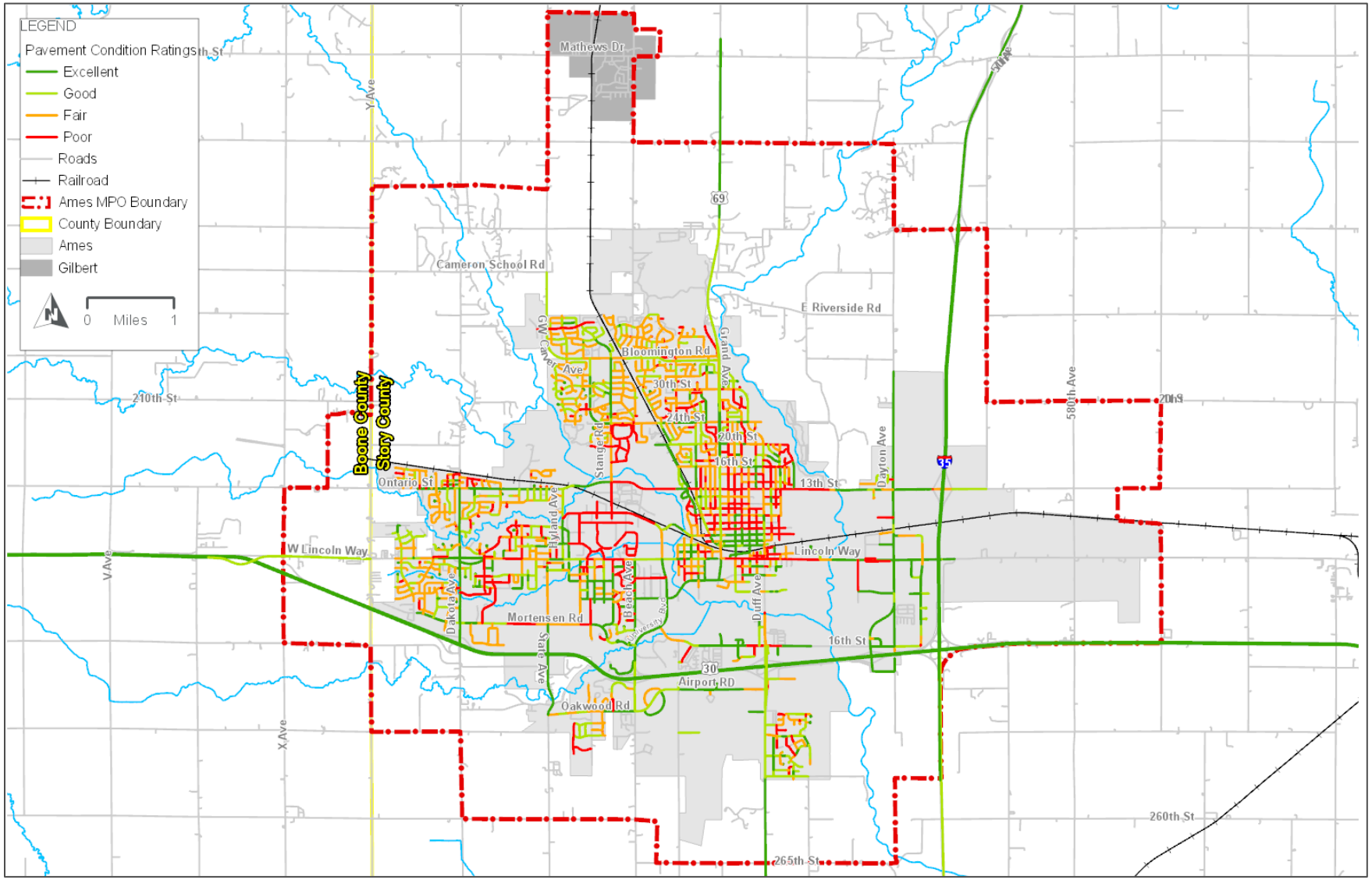
Source: AAMPO

Table 3-5: Pavement Condition Ratings for NHS Routes

Functional Classification	Pavement Condition						Total
	Poor		Fair		Good		
Interstate	0	0%	0	0%	56.71	100%	56.71
Non-Interstate NHS	4.37	4%	10.03	9%	97.46	87%	111.86
Total	4.37	3%	10.03	6%	154.17	91%	168.57

Source: AAMPO

Figure 3-7: Pavement Condition Ratings for AAMPO Roads

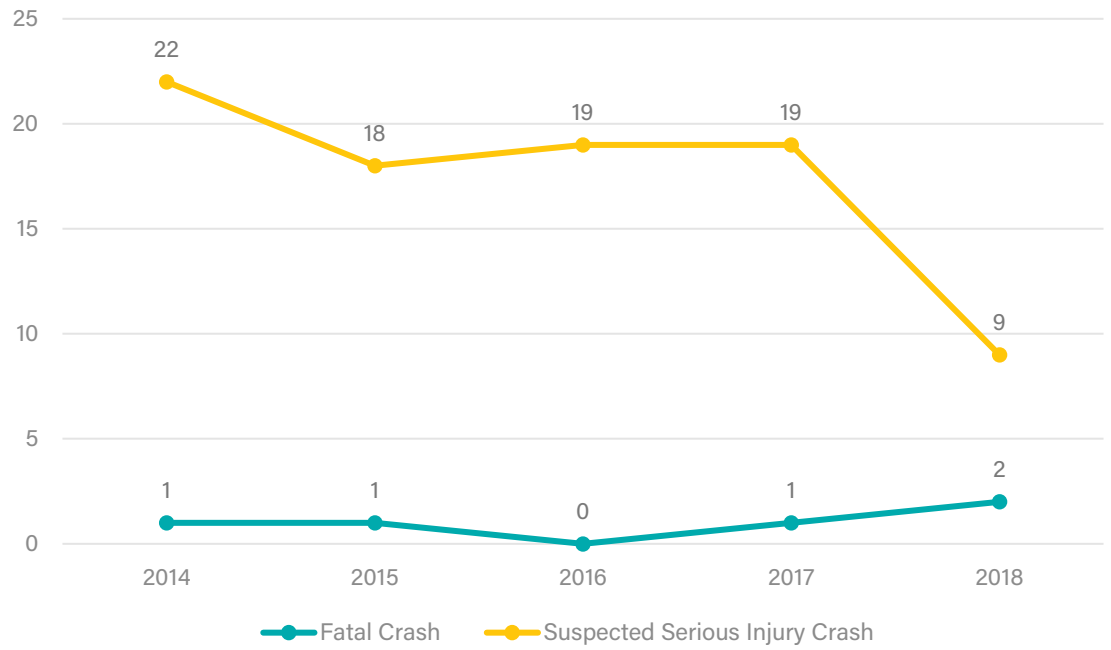


System Safety

Fatal and Serious Injury Crash Frequencies

The number of crashes resulting in fatalities on AAMPO roads has remained consistent, averaging 1 per year, while the number of crashes resulting in serious injuries has been declining since a 2014 level of 22, with an average of 17 per year. **Figure 3-8** shows the 5-year trend for these crash types for the years 2014 through 2018.

Figure 3-8: Fatal and Serious Injury Crashes, 2014-2018

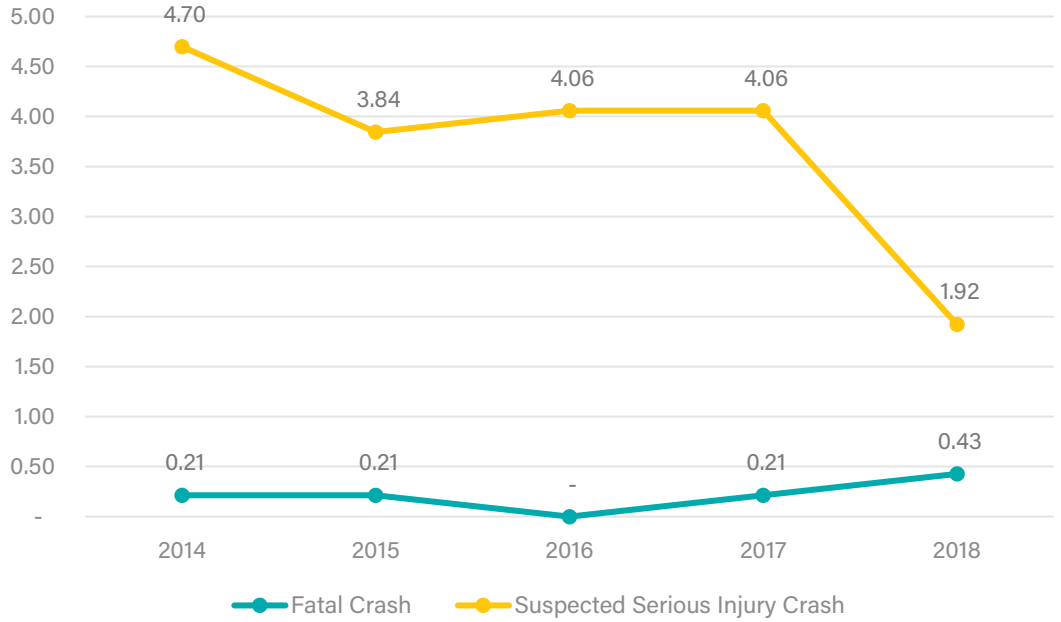


Source: Iowa DOT, Iowa Crash Analysis Tool (ICAT)

Fatal and Serious Injury Crash Rates per 100 Million VMT

Fatal crash rates per 100 million VMT stayed constant during the years 2014 through 2017, then saw a slight increase in the year 2018. The rates of serious injury crashes per 100 million VMT saw a significant decrease between 2014 and 2018, as these crash types became less frequent during the 5-year period. **Figure 3-9** summarizes the annual trend for fatal and serious crash rates per 100 million VMT between 2014 and 2018.

Figure 3-9: Fatal and Serious Crash Rates per 100 Million VMT, 2014-2018

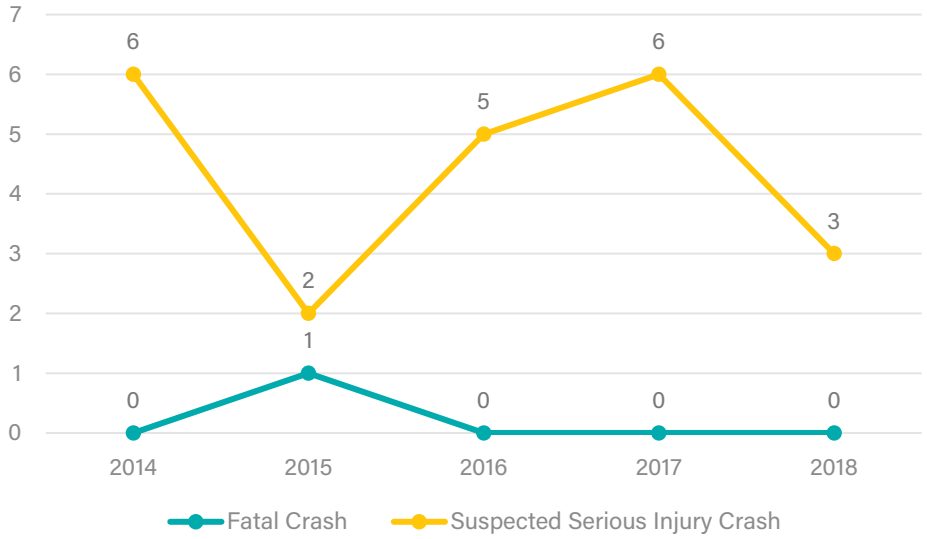


Source: Iowa DOT, Iowa Crash Analysis Tool (ICAT)

Non-motorized Fatal and Serious Injury Crash Frequencies

Fatalities resulting from crashes involving a non-motorized mode have been rare in the MPO area, averaging less than 1 per year between 2014 and 2018. Non-motorized crashes in which a serious injury occurred have fluctuated between a high of 6 in both 2014 and 2017, with a low of 2 in 2015. During 2014 to 2018, the MPO area averaged 4 non-motorized crashes per year that resulted in serious injury. **Figure 3-10** shows annual fatal and serious injuries related to non-motorized crashes between 2014 and 2018.

Figure 3-10: Non-Motorized Fatal and Serious Injury Crashes, 2014-2018



Source: Iowa DOT, Iowa Crash Analysis Tool (ICAT)

Bicycle and Pedestrian System Conditions

Existing Bicycle and Pedestrian System Network

AAMPO's existing bicycle and pedestrian system is comprised of several different types of on- and off-street facilities as shown in **Table 3-6** and on **Figure 3-11.**

Table 3-6: Existing Bicycle and Pedestrian Facilities

Facility Type	Length (miles)
Bike lanes	9
Paved shoulder	13
Signed bike routes / shared lanes	13
Paved sidepaths	60
Unpaved sidepaths	6

Source: AAMPO

EXAMPLES OF EXISTING ON- AND OFF-STREET BICYCLE FACILITIES IN THE REGION

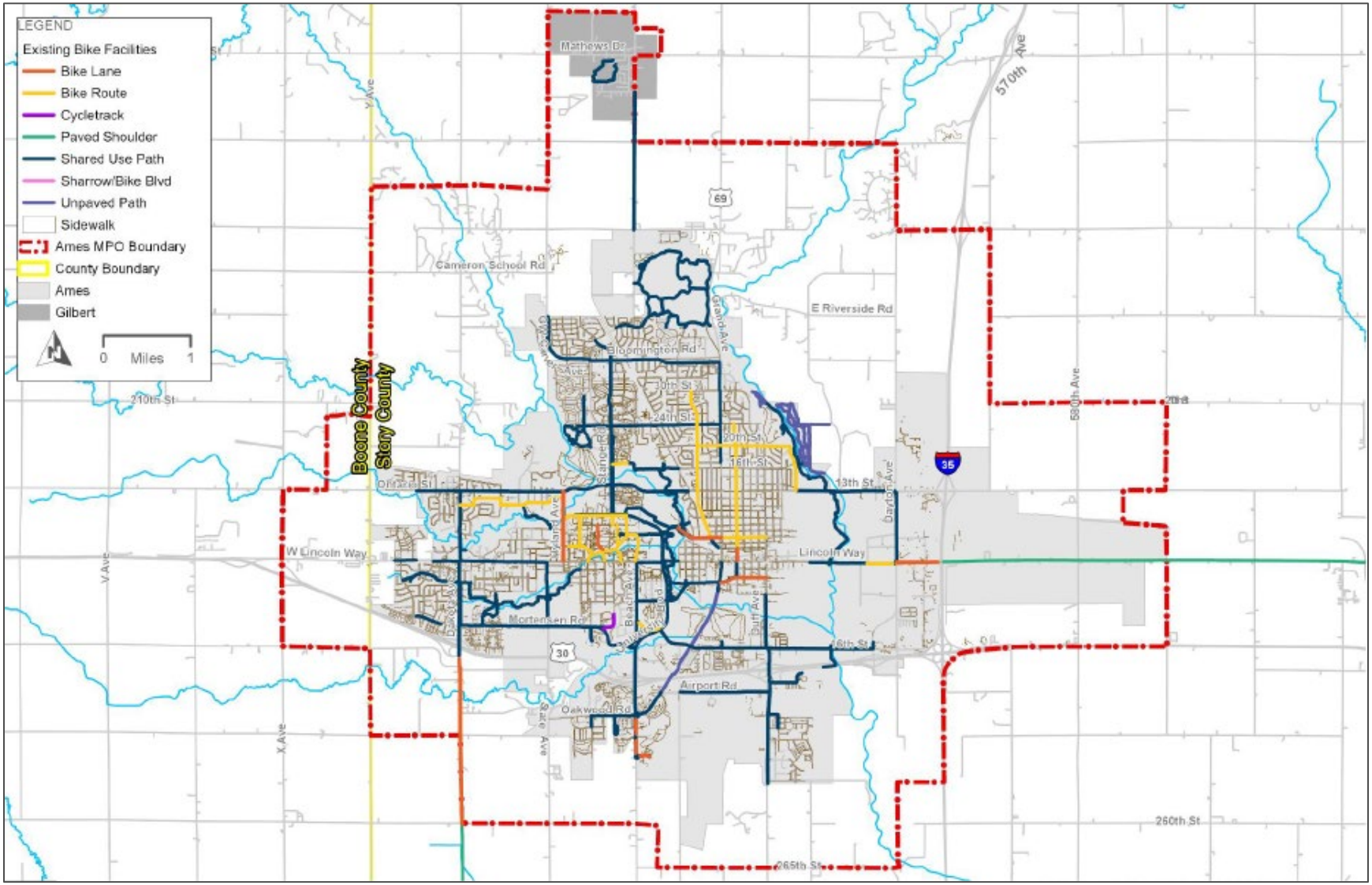
The University Boulevard sidepath includes a landscape buffer.

Example of a sidepath adjacent to the motor vehicle lane.

Examples of on-street facilities include bike lanes. Pictured is an example of bike lanes, which are on S 3rd Street/S 4th Street.

Example of sharrows, which are found on Pammel Drive on the ISU campus, which are restricted to transit, bike and pedestrian use only.

Figure 3-11: Existing Bicycle and Pedestrian Network



Bicycle Level of Traffic Stress

Bicycle Level of Traffic Stress (LTS) for the AAMPO region bicycle and pedestrian network ranked roads and intersections on a scale of 1 to 4, with 4 being the most stressful due to a number of roadway characteristics (for more information, **Appendix B**).

The resulting bicycle LTS shows that the more stressful roads in the region are:

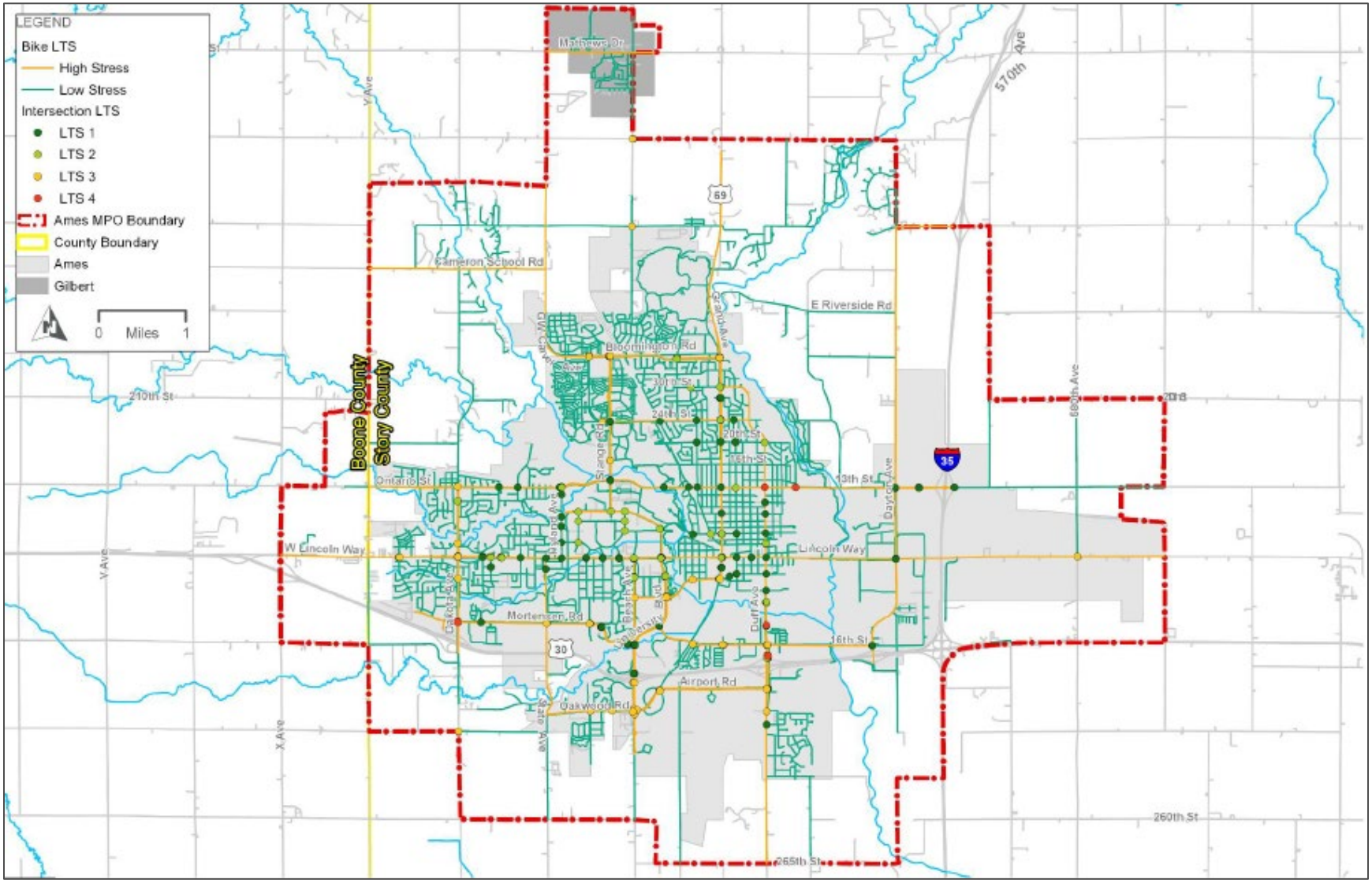
- Lincoln Way
- Grand Avenue
- Duff Avenue
- 13th Street
- Dayton Avenue
- Stand Road
- George Washington Carver Avenue
- University Boulevard
- Beach Avenue
- Cameron School Road
- Ontario Street
- N and S Dakota Avenue
- Mortensen Road
- Oakwood Road
- Airport Road
- 16th Street

The intersections in the AAMPO region that considered to be more stressful for bicyclists are:

- South Dakota Avenue & Mortensen Road
- South Duff Avenue & Chestnut Street
- South Duff Avenue at US 30 westbound ramp terminal
- South Duff Avenue & 13th Street
- 13th Street & Meadowlane Avenue

Figure 3-12 shows the complete bicycle LTS for AAMPO roads and intersections

Figure 3-12: Bicycle Level of Traffic Stress



Transit System Conditions

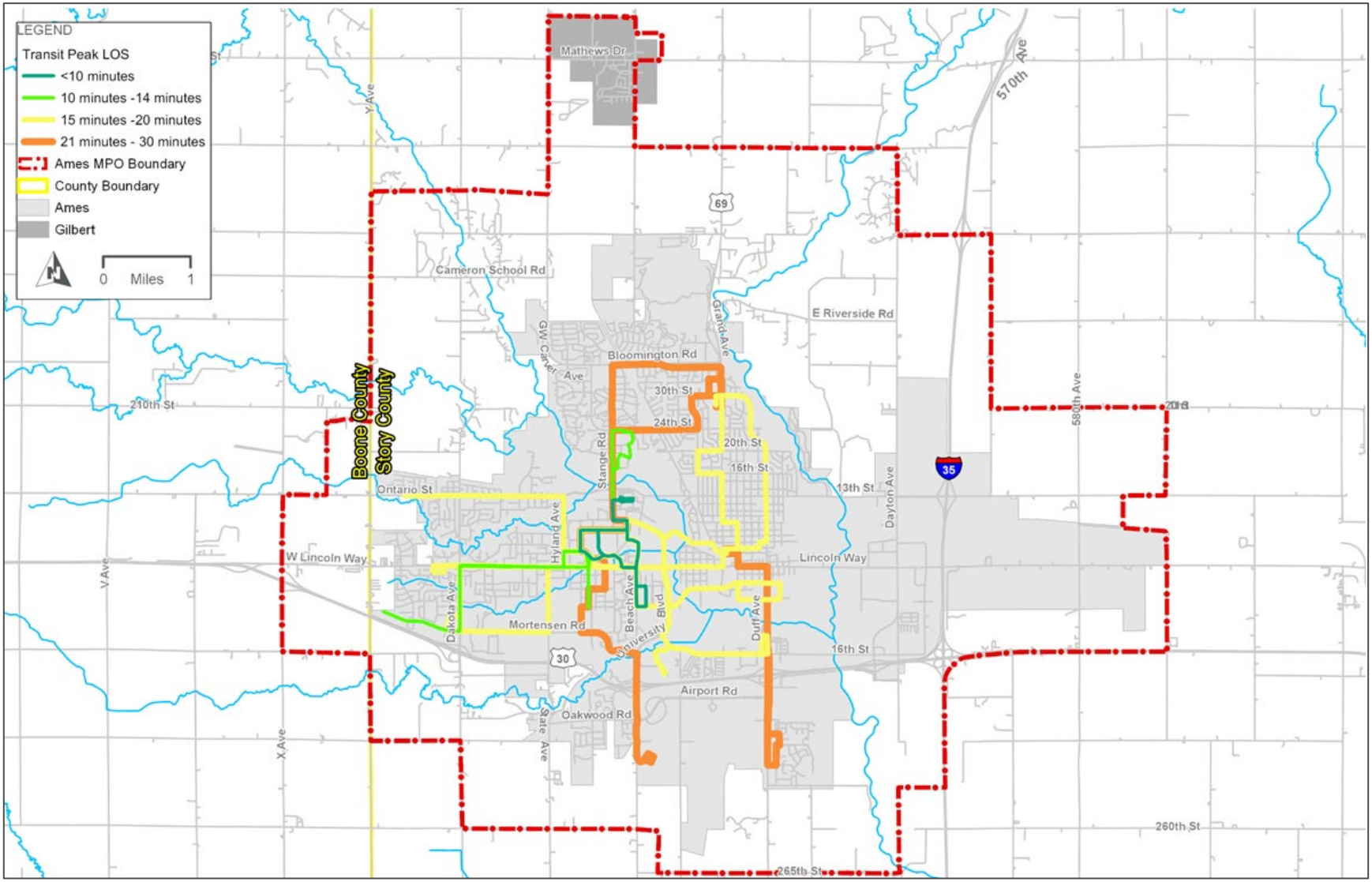
Transit Services

CyRide is the primary transit service provider in the AAMPO region and operates local bus and paratransit services to riders throughout the City of Ames. CyRide is a division of the City of Ames and operates in partnership with Iowa State University (ISU) and Iowa State University's Government of the Student Body (GSB). Additional transit services in the MPO area are presented in **Table 3-7**, while **Figure 3-13** shows a map of CyRide's current fixed routes.

Table 3-7: Transit Services in the AAMPO Region

Service	Description
CyRide	Primary transit provider in the MPO area, operating 13 fixed routes as well as paratransit services.
East Ames Service Extension (EASE)	On-demand, curb-to-curb service serving the eastern part of the City of Ames. Riders are picked up at Ames City Hall and dropped off at any location in the eastern part of the city.
Moonlight Express	Fare-free service with three routes and an additional door-to-door service for Ames residents living outside of other shuttle coverage areas. This service is offered during the University's Fall and Spring semesters
Paratransit	Door-to-door paratransit service operated by CyRide and contracted through Heart of Iowa Transit Agency HIRTA), serving individuals with a disability who reside within the City of Ames.
Regional Public Transit Service	Additional service provided by HIRTA includes a regional door-to-door service throughout central Iowa.

Figure 3-13: CyRide Fall 2019 Route Network



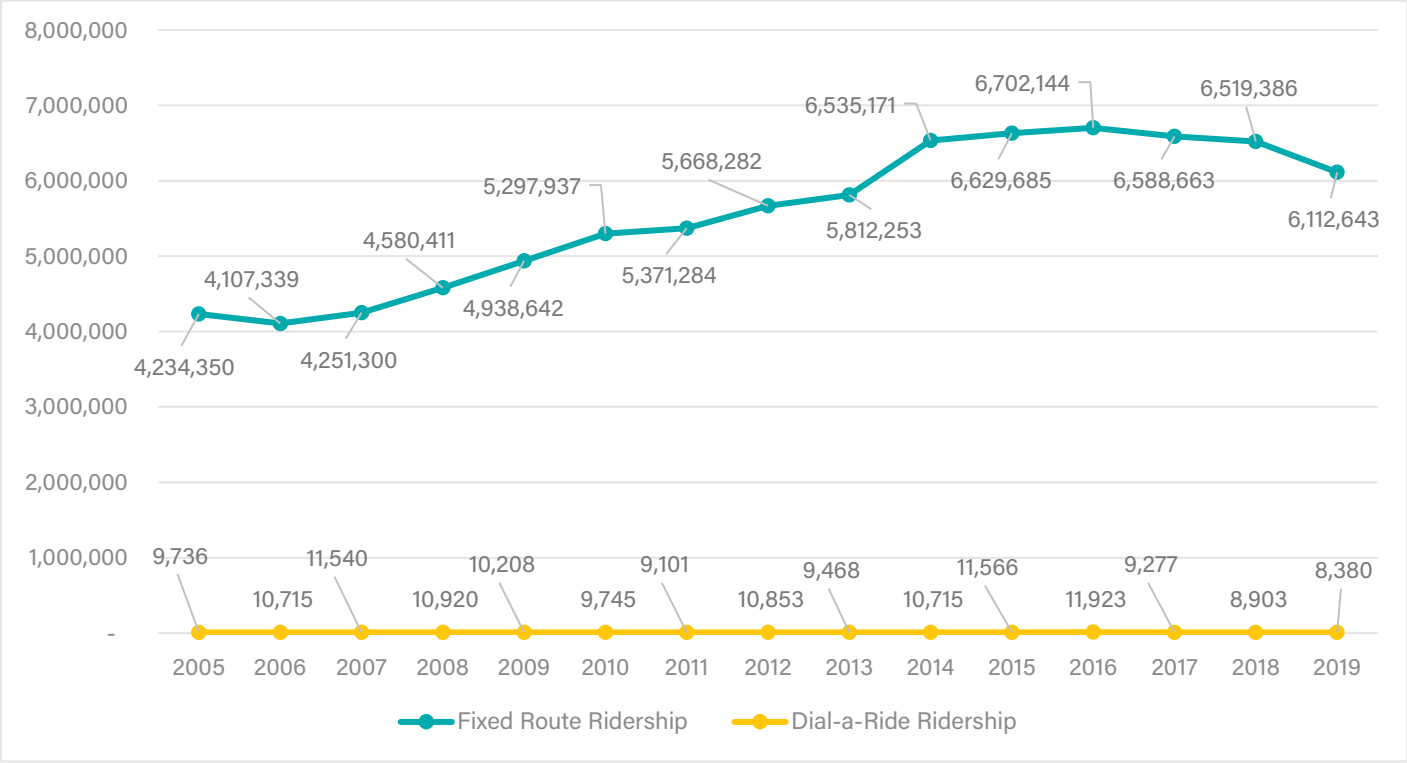
System and Route Performance

System Level Performance

Demand for fixed-route transit service in Ames grew continually from 2006-2016; however, in recent years overall ridership has declined as seen in **Figure 3-14**. Some other transit system-level trends include:

- Fixed-route service saw a 6.9% decrease in ridership in FY2019 compared to FY2018
- Dial-a-Ride service has fluctuated throughout the years but has seen a steady decrease between FY2016 to FY2019

Figure 3-14: Annual Fixed-Route and Paratransit Ridership, 2005-2019

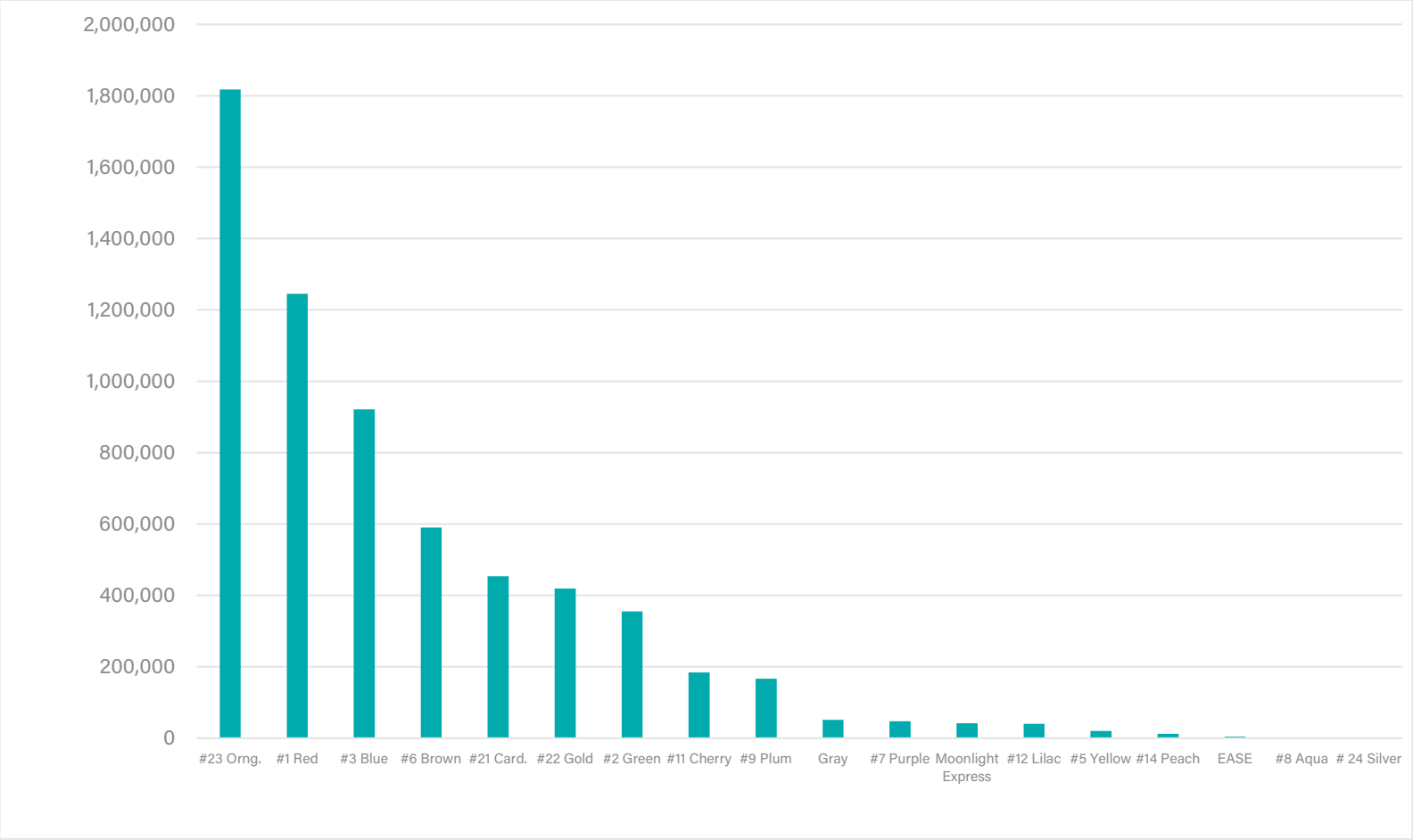


Source: CyRide

Route Level Performance

- Highest ridership routes: #23 Orange, #1 Red, #3 Blue-65% of trips made during FY2018
  Lowest ridership routes: #14 Peach, #5 Yellow, #12 Lilac-Less than 1% of trips made during FY2018

Figure 3-15: FY2018 CyRide Ridership per Route



Source: CyRide

Transit Level of Service

Level of Service Results

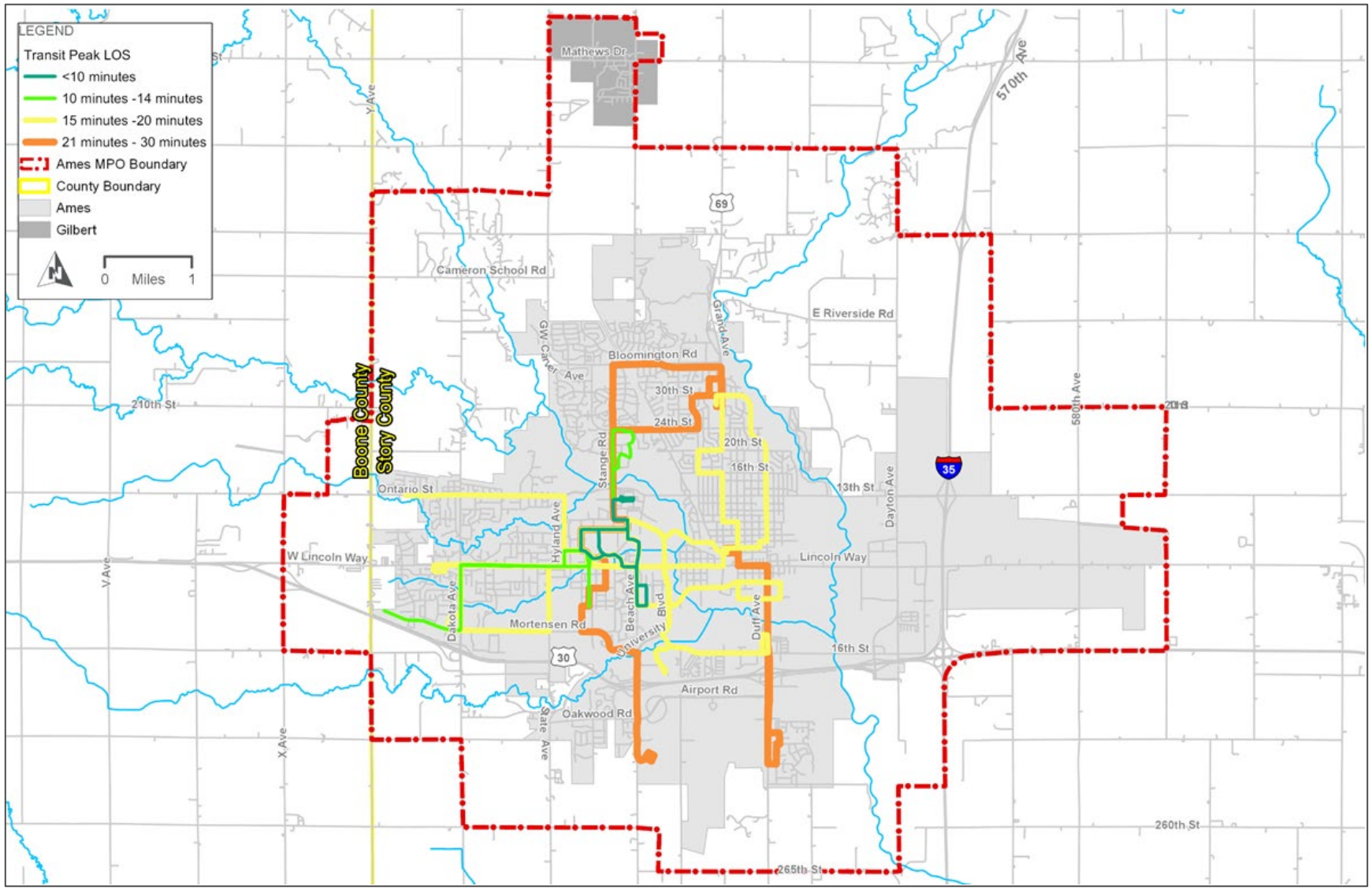
Transit level of service for CyRide's peak period (defined as 6 a.m. to 9 a.m. and 3 p.m. to 6 p.m. on weekdays), shown in **Figure 3-16**, identifies the fixed-routes that operate at the highest and lowest LOS.

- Highest LOS routes:
  - #23 Orange
  - #21 Cardinal
  - #11 Cherry
  - #25 Gold
- Lowest LOS routes:
  - #5 Yellow
  - #6 Brown
  - #14 Peach

Frequency (Minutes)	Description
<10	No bus schedule needed
10 - 14	Passengers may consult schedules
15 - 20	Passengers will consult schedules to minimize wait time
21 - 30	Passengers adapt travel to transit schedule
31 - 40	Provides minimal service to meet basic travel needs

Source: TCRP

Figure 3-16: Transit Peak Level of Service



Freight

Freight activities provide a foundation for the regional economy of the AAMPO area, as several critical state and national freight corridors are within the MPO boundary. In addition to the critical highway facilities located within the MPO area, several freight rail lines are operated in the region. This section of the plan will present an overview of the existing highway, rail, and pipeline freight system conditions.

Highway Freight

The efficient movement of goods is contingent upon a reliable freight network that is capable of maintaining multi-modal connections. Within the AAMPO boundary, there are 7 major freight routes that serve the industrial and manufacturing facilities within the region:

- Interstate 35
- U.S. Highway 30
- U.S. Highway 69
- S. Duff Avenue
- S. 16th Street (east of S. Duff Avenue)
- Lincoln Way (east of S. Duff Avenue)

Rail Freight

Union Pacific Railroad (UPRR) operates several freight lines within the AAMPO boundary. The east-west mainline track consists of two tracks that run through the City of Ames, north of Lincoln Way, while the north-south track is a single track that passes through the City of Gilbert and meets the east-west line just west of Grand Avenue and Lincoln Way.

Pipelines

There are 195.12 total miles of active pipelines in Story County, with 99.23 miles dedicated to gas transmission and the remaining 95.89 miles used for hazardous liquid mileage. In Boone County, there are 282.12 miles of active pipelines—253.32 miles of gas transmission pipeline and 28.81 miles of hazardous liquid pipeline.[3]

[3] National Pipeline Mapping System, Active Pipeline Database

Existing Regional Connections

While private vehicle travel is the predominate mode within the AAMPO area, the reliability of the local transportation system is contingent upon its ability to remain balanced and maintain connections with other transportation modes. This section of the plan discusses the existing regional connections, including rail, aviation, and waterways.

Intercity Bus Service

Several operators provide intercity bus service between the City of Ames and other communities not served by aviation services. These intercity services are based at the Ames Intermodal Facility, located at Hayward Avenue and Chamberlain Street. Users can then connect to destinations in the MPO area that are served by the fixed route transit system. The current intercity bus services serving the AAMPO region are:

- **Jefferson Lines**: Jefferson Lines serves the I-35 corridor through the state of Iowa, offering daily bus service to destinations north and south of the City of Ames. Jefferson Lines also offers the College Connection service, which provides intercity bus service to college campuses across the Midwest.
- **Executive Express**: Executive Express provides one-way and round trip shuttle service to and from the Des Moines International Airport, picking up users at the Ames Intermodal Facility or the Quality Inn and Suites Starlight Village Conference Center located on E 13th Street. Executive Express also offers professional charter services.

Passenger Rail

While Union Pacific operates several freight lines in the AAMPO region, there are currently no passenger rail lines in operation. However, the Boone & Scenic Valley Railroad operates several seasonal passenger lines, such as the Wolf Dinner Train and the Santa Express. These lines operate between the City of Boone and Fraser, IA.

Amtrak offers passenger rail service from their stations located in Creston, IA and Osceola IA; the Creston station is located 106 miles south of the City of Ames while the Osceola station is located 85 miles to the south.

Aviation

Aviation services within the AAMPO boundary are provided by the Ames Municipal Airport, which is located two miles southeast of the City of Ames. While the airport is open to the public, the only service offered is general aviation; the nearest facility offering commercial aviation is the Des Moines International Airport, located approximately 40 miles south of the City of Ames. Executive Express, a shuttle service operated from the Des Moines International Airport, offers regular service to and from the City of Ames.

The Ames Municipal Airport is in the National Plan of Integrated Airport Systems (NPIAS), which is a biennial report developed by the Federal Aviation Administration that plans the five-year development needs for airports within the national system.[4] Due to eligibility in the NPIAS, the Ames Municipal Airport is in consideration for being a recipient of FAA funding for facility improvements.

Airport operational statistics are available from Airnav.com. The main operational statistics for the Ames Municipal Airport include:

- 78 aircraft based on the field
  - 53 single engine airplanes
  - 7 multi-engine airplanes
  - 2 jet airplanes
  - 13 glider airplanes
  - 3 ultralight airplanes
- 92 aircraft operations per day
  - 56% transient general aviation
  - 37% local general aviation
  - 5% air taxi
  - 1% military

[4] Iowa Aviation System Plan, https://iowadot.gov/aviation/studiesreports/technicalreport/4%20-%20Chapter%201.pdf

Waterways

A notable recreational waterway located in the AAMPO region is the Skunk River Water Trail. Beginning in Story City and passing through the City of Ames, this popular water trail provides a scenic route for paddlers of all skill levels. Numerous access points are found within the AAMPO boundary and offers residents an outdoor recreation activity for the spring and summer months.

Alternate Mobility Providers

Travelers within the AAMPO region have a slate of mobility options to choose from in addition to public transit and the bicycle and pedestrian network. Uber and Lyft, two popular ridehailing services, operate in Ames and allow users to connect with drivers via a smart phone application. The carsharing service Zipcar operates on the Iowa State University campus and is aimed towards providing students and university staff with a low-cost mobility option through providing vehicles that can be rented on an hourly basis; these vehicles are rented at an on-campus location and must be returned to the same location. Zipcar is available to the public, but users must be 18 years or older and hold a valid driver's license. Cyclone Cab provides a traditional taxi service within the City of Ames.

The State of the Existing System

Existing conditions on the AAMPO roadway system reflect a network that operates efficiently, with limited recurring peak hour congestion and reliable corridors for passenger and freight vehicles. Regional infrastructure is sound, with the majority of bridge structures and roadway pavement in good condition. In terms of safety, the number of fatal and serious injury crashes for cars and non-motorized modes have been steady or decreasing, while intersections with the highest crash frequencies and crash rates have been identified and safety countermeasures for these locations have been discussed.

A number of roads and intersections in the AAMPO were determined as higher stress for bicyclists, and these locations will be further evaluated when developing alternative projects for inclusion in the MTP. Fixed route and paratransit usage has been decreasing since its peak ridership in 2016, while the fixed routes that have recorded the highest levels of ridership continue to be those serving the ISU campus and central Ames. As the MPO looks to a more multi-modal future, building off the existing non-motorized facilities and developing connections with the existing CyRide routes can help reach this goal.

System Performance and Targets

Performance-based planning and performance management became a focus of State and regional transportation planning with the signing of the 2012 surface transportation bill Moving Ahead for Progress in the 21st Century (MAP-21). The Federal government established seven national goals through MAP-21, and then maintained in subsequent Federal legislation, with the purpose of improving decision-making through performance-based planning and programming. Federal Highway Administration has established required performance measures in 23 CFR 490.

System and Freight Reliability

Goal: Achieve a significant reduction in congestion on the National Highway System.

Performance Targets: Rather than setting its own system and freight reliability targets, the Ames Area MPO has chosen to support the Iowa DOT's system and freight reliability targets as submitted in the most recent baseline period performance report (2018).

Table System and Freight Reliability Performance Measure	2018 Performance*	4 Year Target
Percent of person-miles traveled on the Interstate that are reliable	100%	99.50%
Percent of person-miles traveled on the non-Interstate NHS that reliable	96.60%	95%
Truck Travel Time Reliability (TTTR) Index	1.12	1.14

Source: AAMPO Draft Transportation Improvement Program, 2021-2024
**2018 Performance sourced from the NPMRDS*

Pavement and Bridge

Goal: Maintain the condition of pavement and bridges in a state of good repair.

Performance Targets: Rather than setting its own pavement and bridge targets, the AAMPO has chosen to support the Iowa DOT's pavement and bridge targets as submitted in the most recent baseline period performance report (2018).

TPavement Performance Measure	2018 Performance	4 Year Target
Percent of Interstate pavements in Good condition	100%	49.40%
Percent of Interstate pavements in Poor condition	0%	2.70%
Percent of non-Interstate NHS pavements in Good condition	87%	46.90%
Percent of non-Interstate NHS pavements in Poor condition	4%	14.50%

Source: AAMPO Draft Transportation Improvement Program, 2021-2024; City of Ames

Bridge Performance Measures	2018 Performance	4 Year Target
Percent of NHS bridges classified as in Good condition	15%	44.60%
Percent of NHS bridges classified as in Poor condition	0%	3.20%

Source: AAMPO Draft Transportation Improvement Program, 2021-2024; FHWA National Bridge Inventory

Road Safety

Goal: Significant reduction in traffic fatalities and serious injuries on all public roads.

Performance Targets: Rather than setting its own safety targets, the AAMPO has chosen to support the Iowa DOT's safety targets as published in the most recent Iowa Highway Safety Improvement Program Annual Report.

Safety Performance Measures	2014-2018 AAMPO Performance*	2017-2021 Statewide Target
Number of Fatalities	1.0	336.8
Fatality rate per 100 million VMT	0.210	0.983
Number of Serious Injuries	17.4	1,370.8
Serious Injury rate per 100 million VMT	3.680	4.002
Non-Motorized Fatalities and Serious Injuries	4.6	131.0

Source: AAMPO Draft Transportation Improvement Program, 2021-2024: Iowa DOT ICAT Database

**2014-2018 Performance is for the Ames Area MPO only*

Transit Asset Management

Goal: Maintain the condition of public transit assets in a state of good repair.

Performance Targets: CyRide, the transit agency within the Ames Area MPO, has established their own TAM plan and targets which they review and amend, if needed, each fall by October 1st. In March 2020, the Ames Area MPO adopted these transit asset management targets that also match CyRide transit asset management targets.

TAM Performance Measure Class	2019 Target	2019 Year-End Results	2020 Performance Target	2021	2022	2023	2024
Rolling Stock: 40'-60' Buses	35%	38%	33% of fleet exceeds CyRide's ULB of 15 yrs.	33%	33%	31%	33%
Rolling Stock: Cutaways	67%	67%	67% of fleet exceeds FTA ULB of 8 yrs.	89%	89%	0%	0%
Rolling Stock: Minivans	0%	0%	0% of fleet exceeds CyRide's ULB of 10 yrs.	0%	0%	0%	0%
Equipment: Shop Trucks	0%	50%	0% of fleet exceeds CyRide's ULB of 10 yrs.	0%	0%	0%	0%
Facilities: Admin./Maint. Facility	0%	0%	0% of facilities rated under 3.0 on TERM scale	0%	0%	0%	0%
Facilities Ames: Intermodal Facility	0%	0%	0% of facilities rated under 3.0 on TERM scale	0%	0%	0%	0%

Source: AAMPO Transportation Improvement Program, 2021-2024

Transit Safety

Transit safety performance measures and targets will be required for MPO TIPs and MTPs beginning July 20, 2021. CyRide is required to approve a Public Transportation Agency Safety Plan (PTASP) by December 31, 2020; after the approval of the PTASP, AAMPO has 180 day to adopt MPO transit safety targets. Should the MTP be amended any time after this date, the inclusion of the Transit Safety performance measures and targets will be required as part of the amendment.

Chapter 4
Future Trends and Needs

Chapter 4 **Future Trends & Needs**

Future System Performance

A performance analysis of the future AAMPO transportation system was conducted to better understand how projected household and employment growth will likely impact future year 2045 regional travel demand. This analysis was based on the Travel Demand Model (TDM) update that uses a base year of 2015 and was developed to support the Forward 2045 plan transportation decisions and investments.

Future Growth in the AAMPO Region

The steady growth in population and employment for the AAMPO region that was presented in Chapter 2 is consistent with the projected future regional household and job growth through the year 2045. While the estimated job and household growth levels are not indicative of how future land uses will be planned, zoned, and phased, they inform the travel parameters used in the future system performance analysis presented in this chapter.

Table 4-1 shows the region-wide changes in the number of households and jobs in the region between 2015 and 2045. These projected levels serve as the primary inputs in the AAMPO TDM, and their development is outlined in the **Appendix C**.

Table 4-1: Projected Regional Growth Trends, 2015-2045

	Households	Population	Employment
2015	26,179	68,221	43,297
2045	33,698	88,546	56,744
Growth	29%	30%	31%

Source: Ames Area MPO, City of Ames, Woods and Poole

As shown in the table, the population and number of households in the AAMPO region are projected to increase by 30% and 29%, respectively, between 2015 and 2045 while the number of jobs is anticipated to increase from a 2015 level of 43,297 to a 2045 level of 56,744. This marks an employment growth change of 31%.

Rather than use counts for the numbers of jobs per TAZ, the AAMPO TDM uses square footage of non-residential land uses as the input representing employment. Employment projections were converted to non-residential building square footages for various

development types to support the TDM. Growth in household and employment levels were allocated to the AAMPO's Traffic Analysis Zones (TAZs), which make up the geographical units employed in the TDM. Projected household growth by TAZ is shown in **Figure 4-1** while projected growth in non-residential land uses by TAZ is shown in **Figure 4-2**.

Figure 4-1: Projected Household Growth by TAZ, 2015-2045

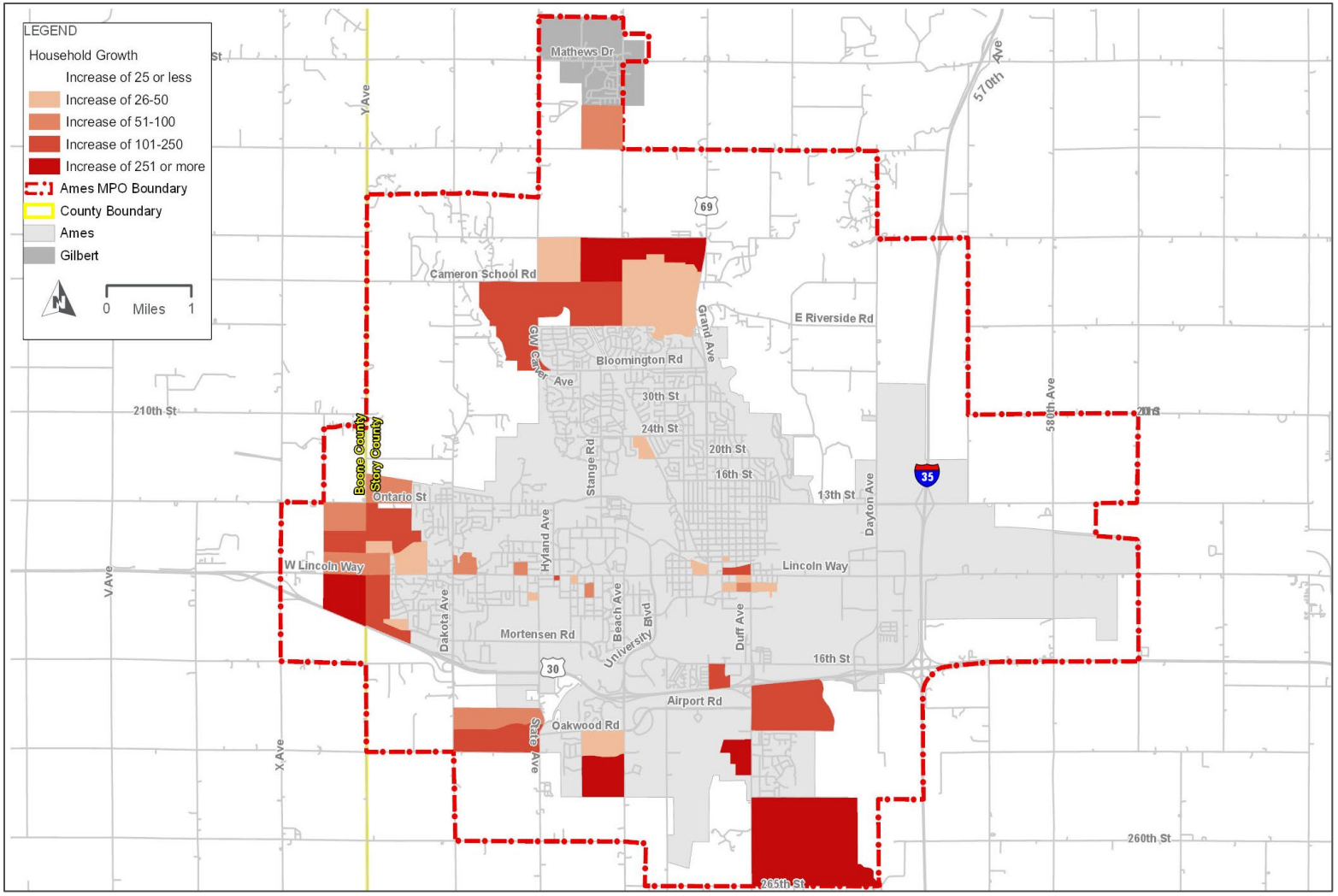
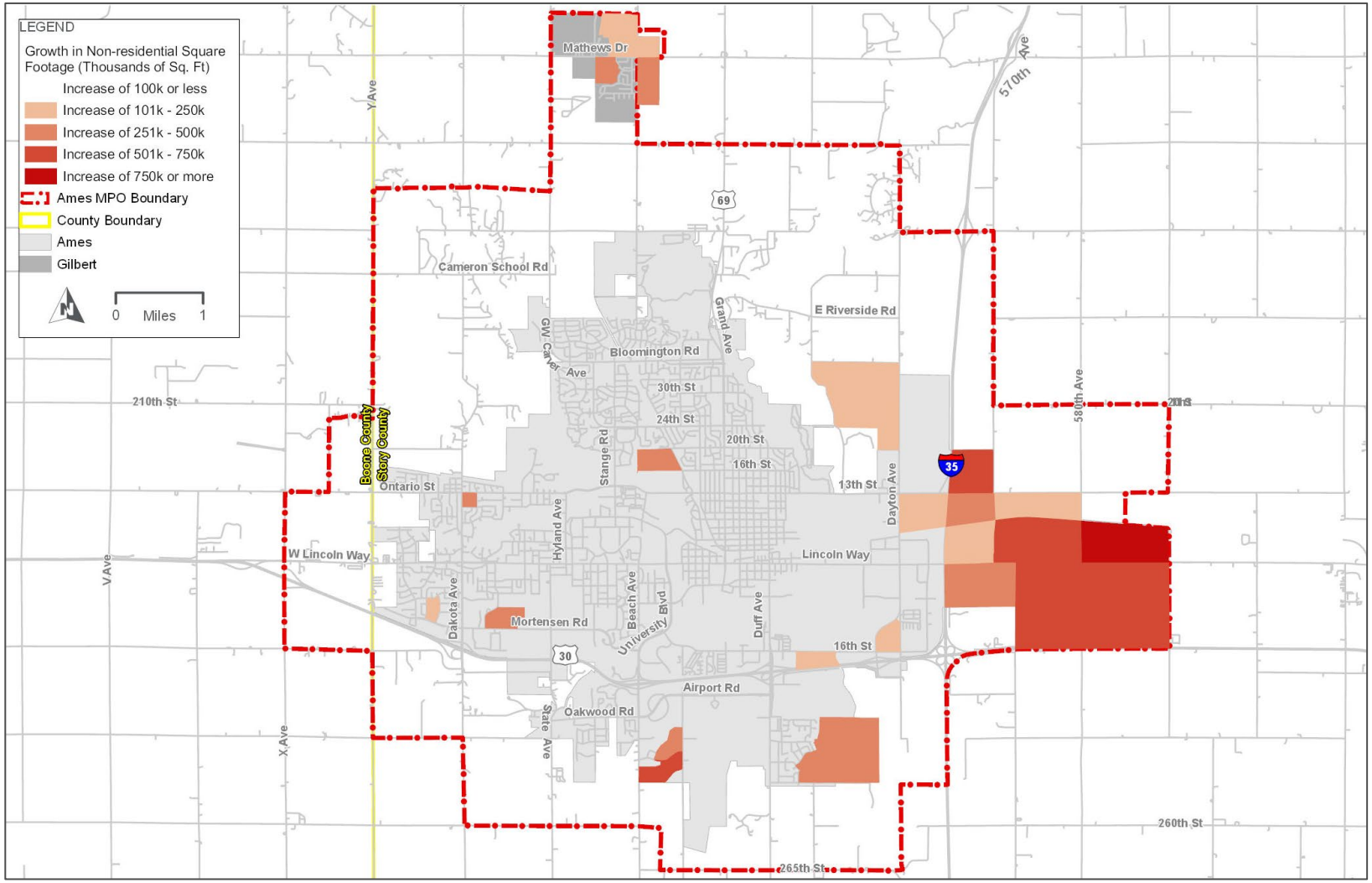


Figure 4-2: Growth of Non-Residential Land Use, 2015-2045



Travel Demand Model

The TDM is a set of mathematical procedures and parameters that simulate daily travel based on residential and employment data. This tool is the primary method for assessing the conditions and performance of the future transportation system, which is done by predicting the number, purpose, origin and destination, and route of trips made on the system. The underlying idea of the TDM is that land use patterns influence the type and number of trips individuals take, with "trip" being defined as travel between two points for a specified purpose, i.e. home to work, home to school, or work to shopping.

AAMPO's model network is comprised of the existing roadways and their characteristics, such as number of lanes, number of turn lanes limits, and speed limits. The geographic bounds of the AAMPO region are divided into Transportation Analysis Zones (TAZs), in which population, employment, and land use data are entered. These TAZs are then connected to one another via the model network and travel patterns are estimated.

In addition to being used to assess future traffic scenarios, TDM output is used in the alternatives development and evaluation process to aid in the identification of projects for inclusion in the fiscally constrained Plan. Several of the scoring metrics discussed in **Chapter 6** involve the TDM output.

2045 Existing plus Committed Baseline

System conditions for the year 2045 used an "existing plus committed" (E+C) network scenario. The E+C scenario is considered a "business-as-usual" scenario in that it assumes no improvements are made to the system beyond the current Transportation Improvement Program (TIP). For this E+C scenario, the existing roadway system plus the following major roadway projects are included:

- Grand Avenue extension, from S 5th Street to S 16th Street
- Cherry Avenue extension, from Lincoln Way to SE 5th Street
- Hoover Avenue and 30th Street to Duff Avenue and 16th Street road diet

Future Traffic Operations

Traffic volumes for the year 2045 were forecasted through comparing the volume output for the base year 2015 model with the output of the 2045 E+C scenario. The household and population data used to update the TDM was sourced from AAMPO, Iowa DOT and Woods and Poole Economics. The allocation of the 2045 household and employment data was based on future growth areas identified through the scenario planning activities of the City of Ames' 2040 Comprehensive Plan.

To account for deviations between 2015 base year modeled and observed traffic levels for 2015, a post-processing procedure was applied to the 2045 E+C traffic volumes. This post-processing procedure recognizes that the difference between the base year 2015 modeled traffic levels and observed 2015 traffic levels should be applied to the 2045 E+C modeled traffic volumes to forecast future traffic volumes. The traffic forecasts for the E+C 2045 network are compared to those for the base year 2015 network in **Figure 4-3**.

System-wide statistics based on the 2045 E+C model run are shown in **Table 4-2**. As shown in the table:

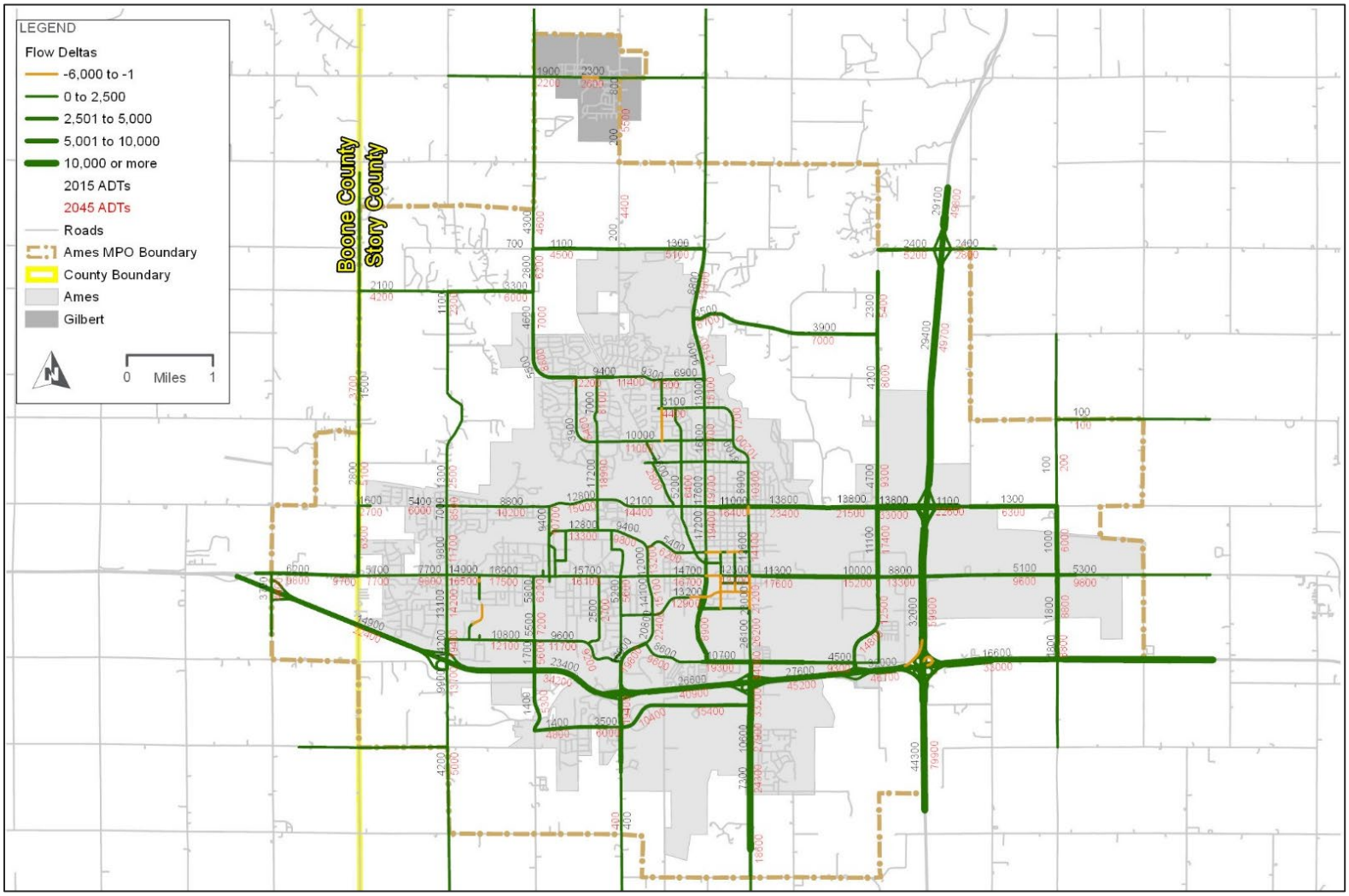
- Vehicle Miles Traveled (VMT) is predicted to increase by 53% during the 30-year period, which indicates that the average trip will be longer, in terms of distance, than trips taken today.
- Vehicle Hours Traveled (VHT) is predicted to increase by nearly 74% under the E+C scenario, which indicates that the average trip will be longer, in terms of time spent traveling, than trips taken today.
- The number of trips are predicted to increase by 31% during the 30-year period.
- Average trip lengths are expected to see a 16% increase, which is consistent with the anticipated growth of the urban area especially at the fringe areas identified as future high growth locations.
- Average travel speeds are expected to see a 12.5% decrease, as consistent with the observation that VHT is expected to outpace VMT. Decreasing average trip speeds indicate future roadway congestion.

Table 4-2: System Wide Statistics for the E+C 2045 Scenario

Performance Measure (Annual)	2015	2045	Change
Vehicle Miles Traveled (VMT)	468,226,535	714,556,026	52.6%
Vehicle Hours Traveled (VHT)	11,836,478	20,602,681	74.1%
Trips	154,187,813	202,555,211	31.4%
Average Trip Length (miles)	3.04	3.53	16.2%
Average Travel Speed (mph)	39.6	34.7	-12.5%

Source: Ames Area MPO Travel Demand Model

Figure 4-3: 2015 ADTs and Forecasted E+C 2045 ADTs



E+C 2045 Traffic Operations

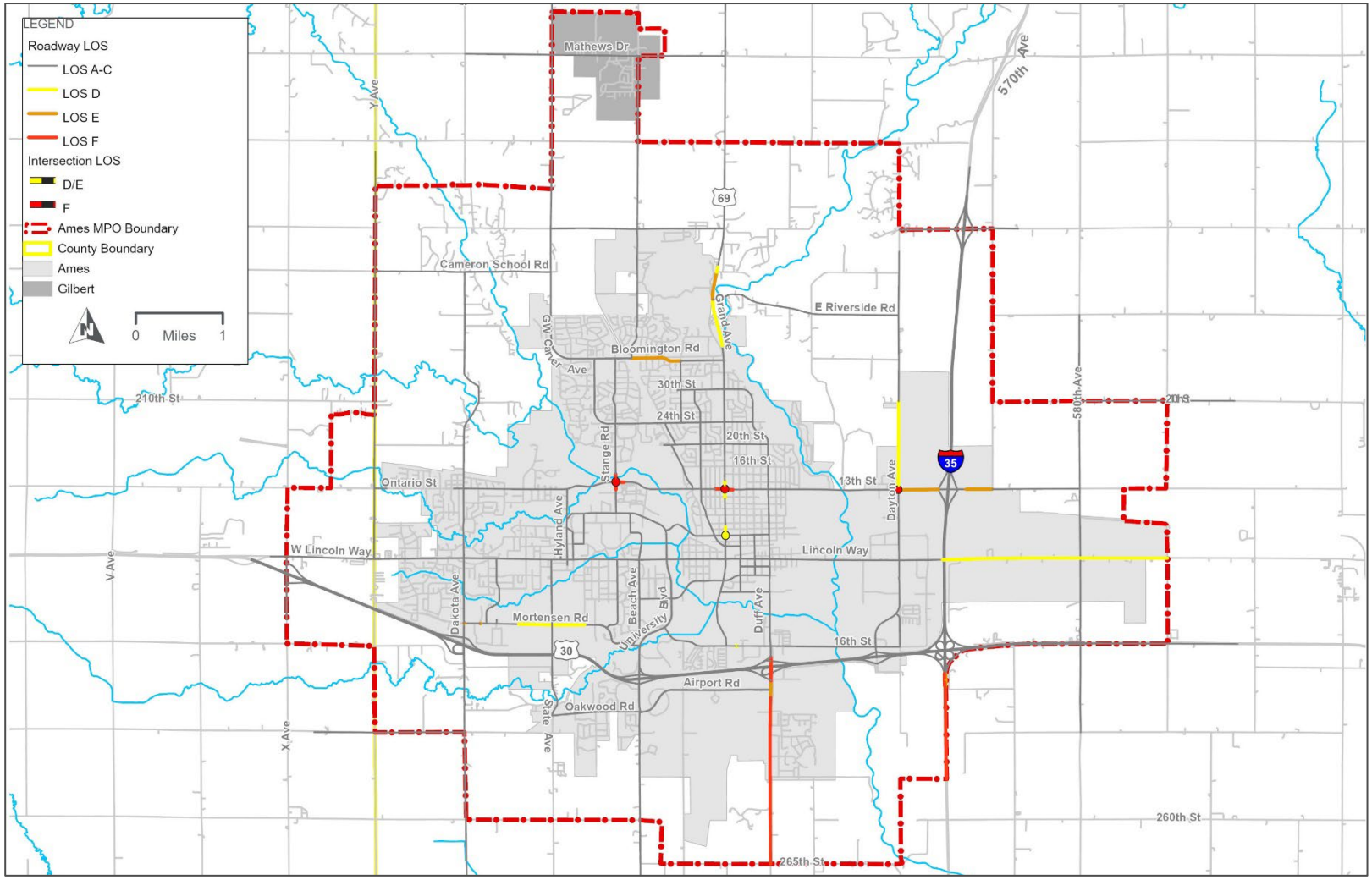
A planning-level assessment of peak hour traffic operations based on the E+C 2045 forecasts was conducted using the volume-to-capacity approach described in Chapter 4: Existing Conditions. The resulting assessment is shown in **Figure 4-4**. The corridors that are projected to exhibit LOS issues (level of service D or worse) under the E+C 2045 scenario are:

- S Duff Avenue, from Highway 30 to 265th Street
- I-35, south of Highway 30
- Mortensen Road, from Seagrave Boulevard to Welch Avenue
- Lincoln Way, from I-35 to 590th Avenue
- Bloomington Road, from Hyde Avenue to Hoover Avenue
- Grand Avenue, from north of Bloomington Avenue to Arrasmith Trail
- E 13th Street, from Dayton Avenue to 570th Avenue
- Dayton Avenue, from E 13th Street to USDA

The HCM approach used in the future traffic operations analysis identified intersections, in addition to roadway segments, that are projected to exhibit LOS issues under the E+C 2045 scenario. These intersections are:

- Stange Road and 13th Street
- Grand Avenue and 6th Street
- Grand Avenue and 13th Street
- Dayton Avenue and E 13th Street

Figure 4-4: Peak Hour Traffic Operations for the E+C 2045 Scenario



Future Multi-Modal System Opportunities

Population growth, employment growth, and future developments highlight where long-term expansions to the transit, bicycle, and pedestrian networks will be needed. New development in the City of Ames is anticipated in four key zones: North Ames, East Ames, South Ames, and West Ames. Infill development and growth in central Ames is concentrated in the Campustown/Lincoln Way corridor and Downtown Ames.

Active Transportation

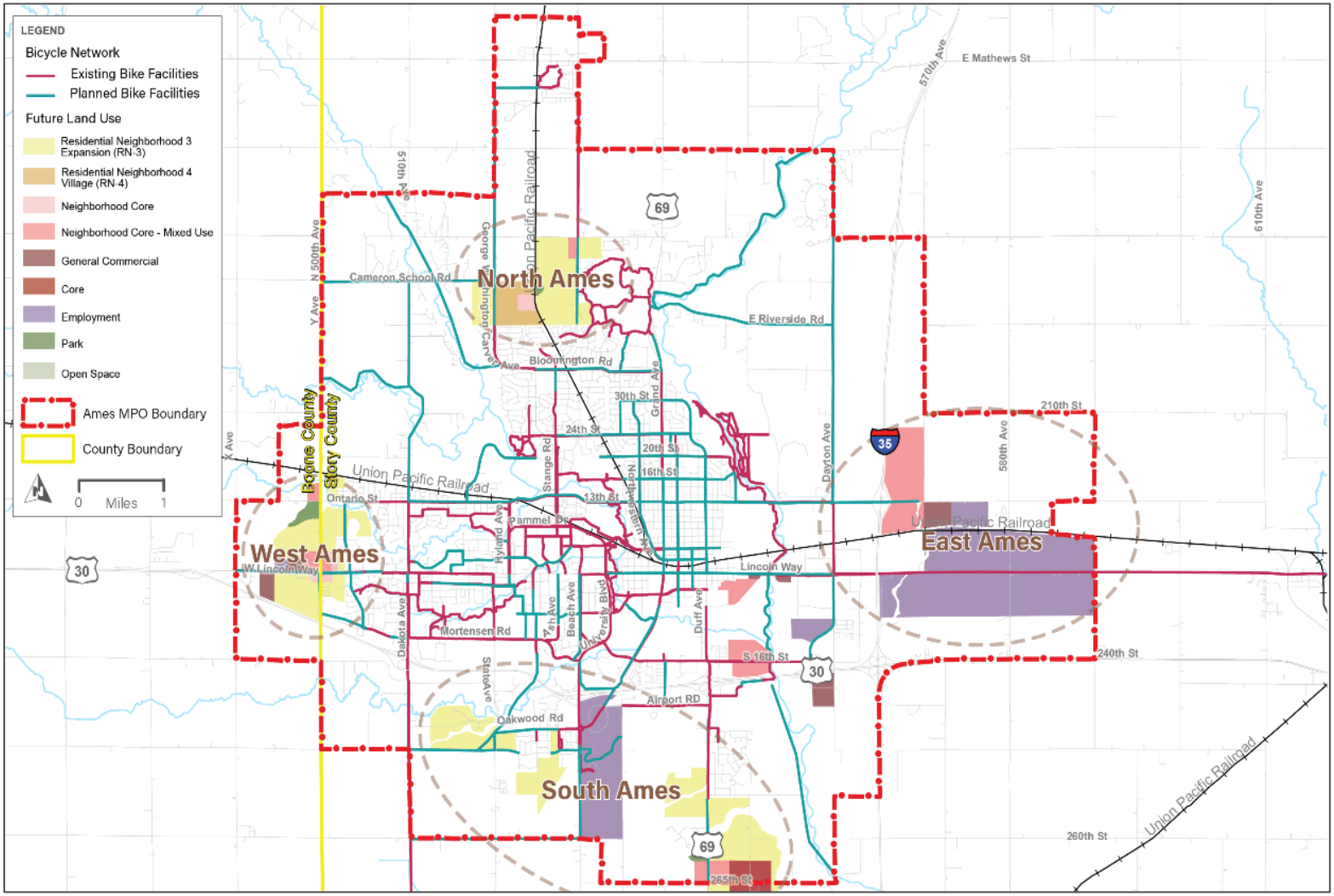
Development of new residential neighborhoods and employment areas at the edge of the city provides opportunities to expand the active transportation network. High-priority gaps for long-term low-stress walking and biking facilities are:

- **North Ames**: Existing and planned biking and walking facilities on Stange Road and Hyde Avenue should continue between Bloomington Road and W 190th Street, connecting future residential and mixed-use areas.
- **East Ames**: Future employment and commercial centers can be served by facilities on: S 3rd Street east of Duff Avenue; 570th Avenue north of E Lincoln Way; 220th Street east of 570th Avenue; 580th Avenue.
- **South Ames**: Neighborhoods and Iowa State University (ISU) Research Park can be better linked to central Ames by facilities on: State Avenue south of Mortensen Road; Cedar Lane south of Oakwood Road; Ken Maril Road; 265th Street east of US 69; 550th Avenue between Ken Maril Road and 265th Street.
- **West Ames**: Existing and planned facilities should be extended into new neighborhoods on Mortensen Road and Ontario Street west of Idaho Avenue. 500th Avenue between US 30 and Ontario Street is a good candidate for a new bike and pedestrian connection.

As local roads are developed in the future growth areas, a complete streets approach should be applied to planning and design.

Figure 4-5 shows changes in land use that increase demand for walking and bicycling.

Figure 4-5: Ames Existing and Planned Bicycle Network and Future Land Use



Transit

CyRide's existing network provides good coverage in the City of Ames. Student housing complexes and destinations on ISU's main campus will continue to generate high demand for transit. **Figure 4-6** shows future household density, and **Figure 4-7** shows land use of future developments. Note that on-campus housing is not classified as households (they are classified as "group quarters"), which explains the main campus' low residential density shown in **Figure 4-6**. There are opportunities for transit investment to support future population and employment growth in these locations and others, including the following:

- **North Ames**: Some development will occur outside the service area and in areas with low levels of existing service, including North Ames. Some of this development will be low density and may be difficult to serve effectively with traditional fixed-route transit service.
- **East Ames**: Jobs located in the eastern portion of Ames are a potential market with a limited level of existing service. However, these locations are also less dense in terms of land use than other areas in the city and may not support traditional fixed-route transit service.
- **South Ames**: New commercial development will likely occur along the South Duff corridor in the form of big box retail. There may be opportunities for improved connections from housing geared toward the general workforce to support employment growth at ISU Research Park.

Lincoln Way will remain an important transit corridor. Given existing activity levels oriented toward ISU, new transit demand will inevitably follow future higher-density multi-unit development anticipated for the western portion of Lincoln Way. Future demand in this area could lead to crowding on buses and will likely require higher levels of capital investment.

Figure 4-6: CyRide System and Household Density in 2045

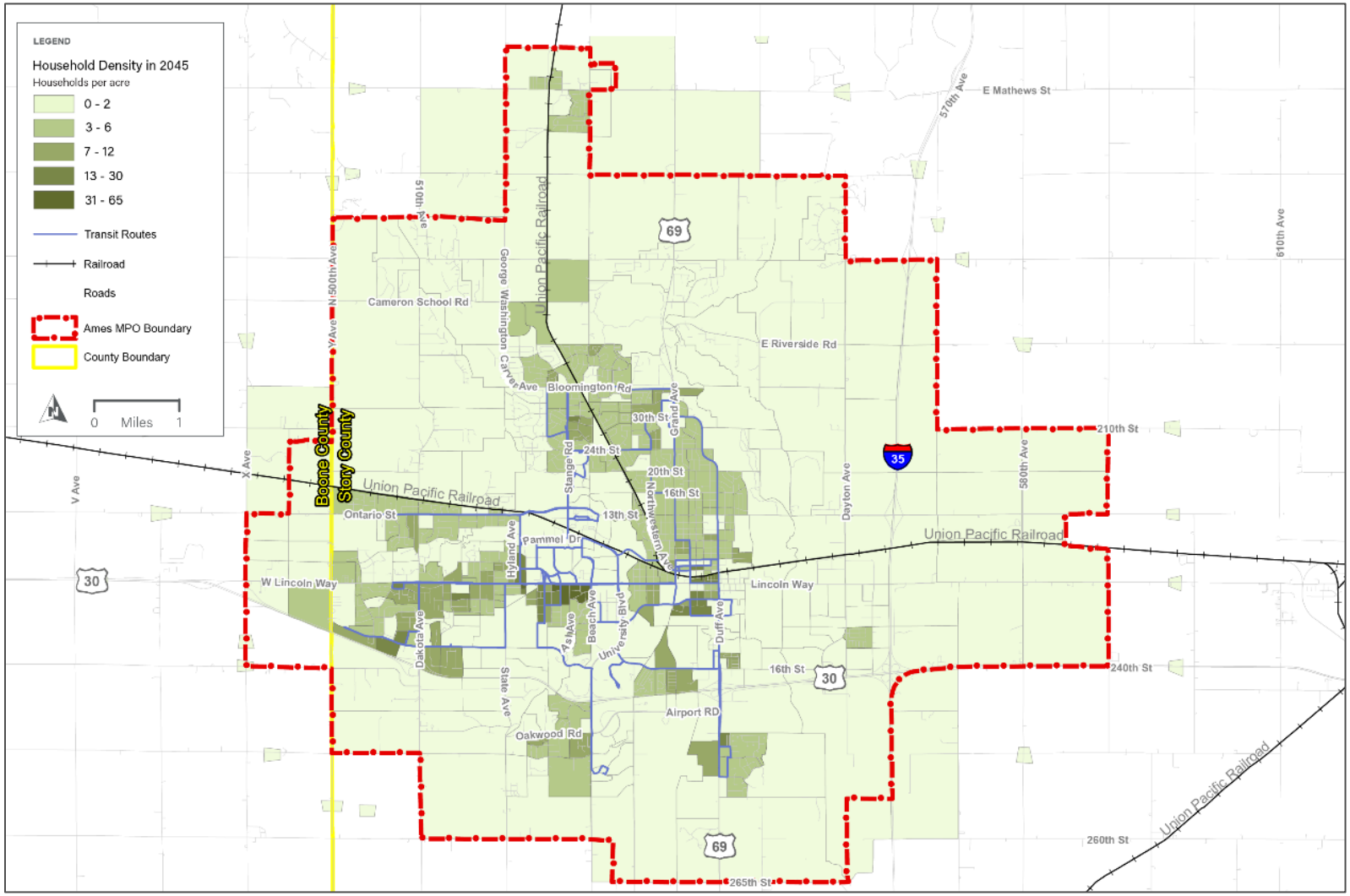
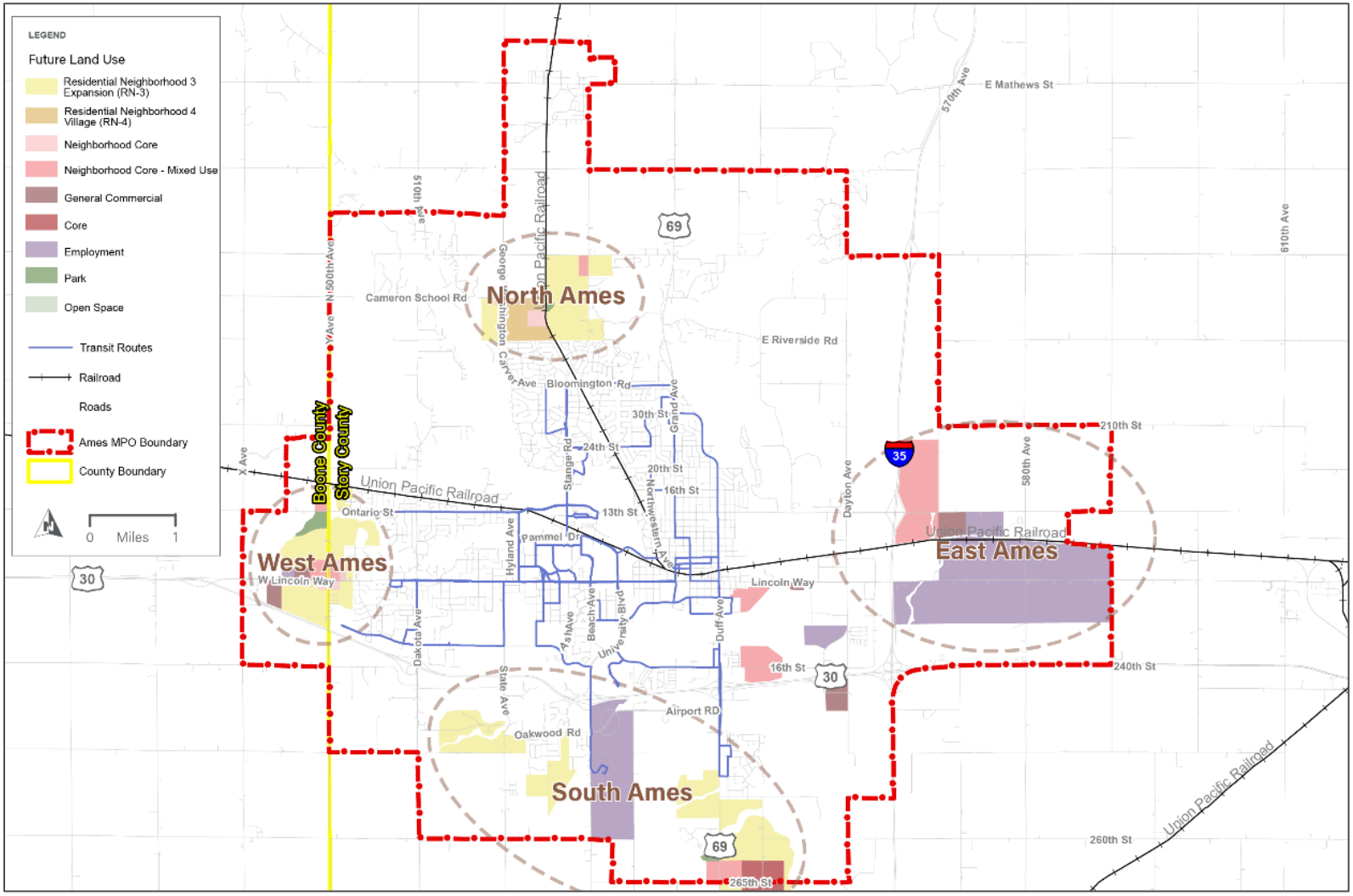


Figure 4-7: CyRide System and Future Land Use



Emerging Transportation Trends and Technology

Transportation is entering an era of unprecedented change. Emerging technologies are coming together at a rapid pace in ways that will shift the underlying assumptions about and operation of our transportation network. The key factors driving this change include connected and autonomous vehicles, electrification, and the emergence of alternate mobility devices for both people and goods.

These emerging technologies are coming closer to wide spread implementation. More autonomous features are being added to new vehicles, with highly advanced versions now testing across the country. Mobility disrupters such as e-bikes and scooters appeared in many cities practically overnight within the past 2 years. Every year brings broader electrification of all types of vehicles in our multimodal fleet. These may seem to be isolated examples of technology deployment, but are actually part of a greater set of trends driving this inevitable change.

Trends

The Accelerating Growth of Technology

The rapid pace of technological change has created planning challenges. While planning horizons typically extend 20 years and longer beyond plan adoption, the exponential growth of technological capabilities has created unanticipated disruption that would have been difficult to foresee and is likely to accelerate even more quickly.

Understanding the rate at which technology adoption grows is a central component to planning for transportation technology, and was first coined in 1936 by aeronautical engineer Theodore Wright[5]. Examining the growth of technologies throughout the last century, this concept has been the most accurate predictor of technology growth across industries.[6]

Wright's law describes exponential growth, the periodic doubling of technological progress within a given time increment. This type of growth is deceptive, as it may start small and appear to be making little progress but eventually the doubling effects produce tremendous growth in a relatively short amount of time. It is through the lens of exponential growth that we should be viewing the future of transportation-related technology and how soon these technologies will need to be addressed. Today's trends that may seem

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[5] Wright TP, (1936). "Factors affecting the costs of airplanes." Journal of Aeronautical Sciences 10: 302-328.

[6] Nagy B, Farmer JD, Bui QM, Trancik JE (2013) Statistical Basis for Predicting Technological Progress. PLoS ONE 8(2): e52669. https://doi.org/10.1371/journal.pone.0052669

linear may in fact be exponential which may lead to technologies and capabilities that seemed unimaginable emerging within a short period of time.

New Mobility

Recent advances in technologies and business models have shaped a new category of transportation, often referred to as "new mobility." These new modes, services, and infrastructure hold both opportunities and risks for our transportation system and our communities, offering greater access and more mobility options, but also creating challenges integrating these options into our transportation system. Many of these technologies are either here already or coming soon, but there is not always a firm understanding of how to implement them and what the full consequences will be.

The Forward 2045 plan has organized these broader new mobility technologies into four sets of trends, which are then tied to a series of potential strategies. These "new mobility" categories and related policy areas will be based upon the following definition:

> *New Mobility - A service, mode, transportation infrastructure, or a combination of these, that leverages new digital communication platforms and data to connect travelers to mobility options to move, share and use the transportation infrastructure.*

The four key new mobility technology trends that will inform the technology and strategy analysis for the Ames Area are:

Autonomous: Vehicle automation for the purpose of transporting people and goods that can navigate and operate without assistance from a human driver or operator.

Connected: The ability to communicate real-time information between mobility modes, infrastructure, users, and any other component critical to the movement of people and goods.

Electric: Transportation that uses stored or transmitted electricity to power a vehicle instead of traditional internal combustion engines (ICE), usually by means of batteries, ultra-capacitors, or hydrogen fuel cells.

Shared: Transportation services and resources that are shared among users, either concurrently or one after another.

These technology areas are intended to address transportation and technology trends that may present future challenges and opportunities for the Ames Area. These technology trend policy areas are often overlapping, collaborative technologies and describe how we might capture the best aspects in the evolving transportation practices in the region.

Chapter 6 contains a discussion of the potential strategies available to AAMPO based on the four key new mobility technologies described above.

Autonomous

What is it?

Vehicle automation for the purpose of transporting people and goods. This technology can navigate and operate without assistance from a human driver or operator.

What are the trends?

Most major automobile manufacturers and tech companies are actively pursuing programs to develop autonomous vehicles as of 2020. These efforts are maturing rapidly. For example, it took Google's autonomous vehicle company Waymo approximately six years to drive a million miles, starting in 2009. Their autonomous vehicles now drive over a million miles per month, and over half of their 20 million total miles driven to date have been in the past year.[7]

Automation, a suite of technologies that enables a vehicle to operate independently of human intervention, does not lend itself to one form of vehicle, mode, or service model over another. This means autonomous vehicles could be privately-owned and operated similar to a single occupancy vehicle, or they could be part of a robo-taxi fleet that provides mobility by trip or subscription. Further, these technologies could be applied to transit vehicles such as buses and shuttles to enable lower operating costs and better service for

Source: HDR

[7] https://venturebeat.com/2020/01/06/waymos-autonomous-cars-have-driven-20-million-miles-on-public-roads/

passengers. The future transportation opportunities and challenges from automation will depend on the forms it takes and how consumer preference and government policies shape the technology.

Full automation will enable different service models, including a Mobility as a Service (MaaS) model, where a traveler would pay for a service (transportation) instead of owning an actual vehicle. This trend could be to be one of the most significant advances in transportation since the mass adoption of the automobile, with consequences extending into land use, traffic, safety, employment, and cost of transportation. The full consequences of automation adoption will likely transform cities and regions. How these technologies will be deployed depends largely on what government policies are in place to direct these changes to the best possible outcomes for communities and individuals.

Several companies have begun development of technology that allows autonomous vehicles, such as scooters, to reposition themselves without human intervention, and the ability to meet travelers at their front door[8]. This technology could negatively impact right-of-way space and visibility and conflict with pedestrians and other vehicles, posing similar challenges to robotic delivery and MaaS curb management issues.

Autonomous vehicles will also move goods, which could present challenges for cities and regions. Delivery robots are navigating city streets on a limited basis today, and their use will likely expand considerably. Companies such as Amazon, FedEx, and UPS have all been developing and testing ground-based robotic delivery systems. The grocery delivery service Nuro recently received National Highway Traffic Safety Administration (NHTSA) approval for fully autonomous delivery on public roads.[9]

[8] https://www.sightline.org/2019/12/27/zombie-scooters-are-coming/
[9] https://www.nhtsa.gov/press-releases/nuro-exemption-low-speed-driverless-vehicle

Connected

What is it?

The ability to communicate real-time information between mobility modes, infrastructure, users, and any other component critical to the movement of people and goods.

What are the trends?

5G and the Internet of Things are next-generation communication technologies that promise ubiquitous connectivity between all facets of transportation. Communications standards based on new technologies, such as Vehicle to Infrastructure (V2I), Vehicle to Vehicle (V2V), and Vehicle to Everything (V2X) are forming the basis of the digital connectivity needed to support future transportation modes and models. These technologies are being applied to a variety of applications, including transit, freight, and safety-critical features such as forward collision warning and forward intersection assist.

Data and information play an increasingly important role in mobility, working to enable MaaS systems, ensure safety-critical functions, and enable the system-wide management and optimization of our transportation network. Connectivity enables services and travelers to make informed decisions based on real-time information and forms the backbone of emerging transportation technologies such as Transportation Network Companies (TNC) and shared micromobility. Connectivity is an enabling set of technologies that can be used to leverage better transportation outcomes and should be coordinated to enable greater functionality for alternative modes such as micromobility or active mobility.

All of the major US cellular carriers have now launched some form of 5G cellular network. 5G is predicted to improve internet speeds 20-fold compared to the fastest network widely available now, 4G LTE.[10]

Source: United States Department of Transportation

[10] https://www.networkworld.com/article/3330603/5g-versus-4g-how-speed-latency-and-application-support-differ.html

Electric

What is it?

Transportation vehicle or infrastructure that uses stored or transmitted electricity to power a vehicle instead of traditional internal combustion engines (ICE), usually by means of batteries, ultra-capacitors, or hydrogen fuel cells.

What are the trends?

Several key metrics will drive the adoption of battery-powered electric vehicles, which is the most popular commercialized type at this time. Since 2010, the battery cost per kWh has fallen approximately 87%. This trend is forecast to continue, making electric vehicles cost-competitive with ICE vehicles around 2024.[11] This drop in price will likely create a strong economic incentive to adopt electric vehicles, creating demand for charging facilities and infrastructure. The performance of batteries also continues to increase, which gives vehicles more range, shorter charging times, and longer battery life. Research group Bloomberg New Energy Finance (BNEF) estimates that by 2040, that 57% of all vehicle sales worldwide will be electric vehicles.[12]

Source: Electrify America

ICE require fossil fuels to run while electric vehicles can utilize any number of domestic power sources to operate, including renewables like wind and solar, carbon-free sources like nuclear, and fossil fuels like natural gas and coal. Moving to electrified vehicle fleets means there is flexibility to add new and cleaner power sources as they become available, with the added benefit of eliminating tailpipe emissions and reducing roadway noise. However, increased demand for electric vehicles will spur increased demand for electricity, inducing further stress on electrical grids and related infrastructure necessary for transmission. A second, planning-related, challenge is the provision of charging stations. As EV fleets grow, so too will the

[11] https://about.bnef.com/blog/battery-pack-prices-fall-as-market-ramps-up-with-market-average-at-156-kwh-in-2019/
[12] https://about.bnef.com/electric-vehicle-outlook/#toc-viewreport

need for publicly accessible charging stations. Many communities throughout the United States have begun considering the need for charging stations in their planning activities and are working towards ensuring these facilities are evenly distributed for all community members.

Shared

What is it?

Transportation services and resources that are shared among users, either concurrently or one after another.[13]

What are the trends?

Enabled by technologies such as wireless communications and smartphones, the trend toward shared mobility has continued to gain traction, especially in urbanized areas.[14] The shared mobility trend encompasses both the sharing of vehicles and the sharing of trips and includes transit, microtransit, TNCs, docked and dockless scooters and bicycles, and carshare. Rapid adoption of shared personal mobility (such as bicycles or scooters) has been further accelerated by the introduction of dockless electric scooters, accounting for nearly 45% of shared personal mobility trips in 2018[15]. The trend toward a frictionless trip planning, ticketing, routing, and payment process is a typical feature of today's shared mobility services and modes. The trends toward shared mobility, however, are not occurring evenly across regions and modes. Shared modes and services work most efficiently in dense urban areas, which have seen the largest adoption rates, while suburban and rural areas may require innovative approaches and policies to develop shared mobility options.

Source: Arlington, VA

While these modes may not be uniformly adopted, they do provide expanded access opportunities for many places. The movement toward shared mobility, along with other technologies such as automation, has led to the emerging concept of MaaS. In general, this describes the movement away from private-vehicle towards purchasing or contracting trips. Although the MaaS market is difficult

[13] https://sharedusemobilitycenter.org/what-is-shared-mobility/
[14] https://www.grandviewresearch.com/press-release/global-shared-mobility-market
[15] https://nacto.org/shared-micromobility-2018/

to pinpoint due to inconsistent definitions and methodologies, several data points indicate a high magnitude of growth over time: the MaaS market is projected to grow from $39 billion (2017) to $358 billion by 2025 (nearly a tenfold increase)[16] and by 2025 it is expected that 18% of Americans will use TNCs like Uber and Lyft daily.[17]

Other Future Modal Considerations

Impacts of emerging transportation technologies are expected to change the manner in which individuals move through urban landscapes. While some of these technologies are starting to see implementation today, other trends have been shifting relationships between transportation systems and land uses. The major trend leading this shift is increasing consumer demand for home delivery of items, aka e-commerce, and the ability of distributors to meet this demand. With companies like Amazon marketing "same-day" delivery, more and more freight vehicles are entering urban areas to deliver e-commerce goods. This is leading to increased congestion, noise, pollution, and safety risks. Another challenge to planning posed by increased home delivery is the conflict between designing roadways that accommodate these freight vehicles and roadways that accommodate a multi-modal system, or Complete Streets. Further impacts stemming from same day delivery could affect aviation as increased demand for this service could incentivize industry to turn to air freight modes in order to expand their same day delivery services. Currently, the Ames Municipal Airport does not support air freight but future planning activities should consider the need for this service.[18]

Freight rail is an additional area for the MPO to consider in future planning activities. The Iowa DOT's 2017 Freight Rail Plan predicts annual increases of 1.1%, 1.4%, and 2.2% for outbound, inbound, and intra movements, respectively, for the dominant industries that utilize rail for freight movements. These industries are agriculture, mining/extraction, and manufacturing, and all three are central to the statewide economy.[19] While they do not play a dominant role within the AAMPO region's economy, increased freight rail movements through the region could pose noise and safety impacts, especially at non-grade separated rail crossings.

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16 https://www.marketwatch.com/press-release/mobility-as-a-service-maas-market-size-will-reach-35835-billion-usd-by-the-end-of-2025-2019-10-17
17 Previous HDR research for Florida DOT
18 Urban Freight Challenges with the Rise of E-Commerce. https://carolinaangles.com/2019/03/21/urban-freight-challenges-with-the-rise-of-e-commerce/
19 Iowa State Rail Plan. https://iowadot.gov/iowainmotion/railplan/2017/IowaSRP2017_Ch2.pdf

Chapter 5
Financial Plan

Chapter 5 **Financial Plan**

Time Frames

For the purpose of forecasted future costs and revenues, three distinct time frames are identified for categorizing future year dollars:

- **Short-Term**: Years 2025-2029
- **Mid-Term**: Years 2030-2037
- **Long-Term**: Years 2038-2045

Federal, State, and Local Funding Programs

Federal Funding Programs

The MPO has frequently received funding from two formula-based Federal funding programs to fund transportation projects within the region:

- **Surface Transportation Block Grant (STBG) Program**: provides funding for roadway projects on Federal-Aid routes, bridges, transit capital improvements, and transportation planning activities.
- **Surface Transportation Block Grant Program funding for Transportation Alternatives (STBG-TAP or TAP)***:* provides funding for projects that provide "transportation alternatives", including bicycle and pedestrian facilities, trails, safe routes to schools, historic preservation, and environmental mitigation.
- **STBG-TAP Flex**: Additional STBG funds that are available to MPO's on a per capita basis. The MPO is responsible for determining how much TAP Flex funding is used in local projects funded using TAP dollars.

Discretionary Federal funding sources that have been included in the previous TIP documents for the AAMPO include:

- **National Highway Performance Program (NHPP)**: Funding support for the condition and performance of the National Highway System (NHS), as well as for constructing new facilities on the system. This funding is directed by the Iowa Department of Transportation (Iowa DOT) for use on the NHS system in the Ames area.
- **Congestion Mitigation Air Quality (CMAQ) Program**: Funding for State and local governments for transportation projects and programs that help meet the requirements of the Clean Air Act. The state of Iowa uses its CMAQ funding for the Iowa Clean Air Attainment Program (ICAAP), which is a competitive grant program described below in state funding programs.

- **Emergency Relief (ER) Program**: Funding dedicated to reconstruction and/or repair of Federal-Aid routes that suffered extensive damage from a natural disaster. The most recent year that the MPO received ER funds was in FY2011.
- **Federal Demonstration Funds**: Funding for "demonstration" projects that used new or innovative construction, funding, or other techniques.[20] These projects leveraged earmarked funds designated by Congress; under Moving Ahead for Progress in the 21st Century (MAP-21), this funding source and other transportation earmarks were eliminated. These funds will not be considered in projecting future funding levels.
- **Metropolitan Planning Funds (PL)**: Federal funds available to all MPOs to carry out Federal requirements, including metropolitan transportation planning process, and transportation improvement programs.

Several state funding sources were identified while reviewing the TIP documents for the previous 11 fiscal years. These state funding sources include:

- **Primary Roads Fund**: The major state funding source for supporting the primary road system within the State of Iowa. A proportion of the overall receipts from the Road Use Tax Fund (RUTF) are deposited into the Primary Roads Fund on an annual basis.
- **State Grants**: Grants administered by the Iowa DOT and other state agencies used to fund transportation projects throughout the state.
- **TIME-21**: Funding created by the State legislature in 2008 to create a dedicated revenue stream for the maintenance and construction of projects on Iowa's primary highway system.
- **Iowa Clean Air Attainment Program (ICAAP)**: Competitive funding source administered by the Iowa DOT for projects that demonstrate potential for reducing transportation-related congestion and air pollution. Roadway, bicycle and pedestrian, transit, and railroad projects are eligible for ICAAP funds. While this is a state of Iowa program, ICAAP funding is sourced Federal CMAQ monies. Historically, the MPO has received ICAAP funds for traffic signal enhancement and transit projects.

Federal Transit Funding Programs

While the majority of Federal funding received by the MPO is reserved for highway and bicycle and pedestrian projects, a substantial amount of funding for transit projects was awarded to the regional transit agency, CyRide, during our financial analysis period of TIPs.

[20] Federal Highway Administration, Guide to Federal-Aid Programs and Projects. https://www.fhwa.dot.gov/federalaid/projects.pdf

Federal transit funds are administered by the Federal Transit Agency (FTA), which oversees a number of funding programs such as:

- **Section 5303-Metropolitan and Statewide Planning and Non-Metropolitan Transportation Planning**: Funds and procedural requirements for multi-modal transportation planning in metropolitan areas and states.
- **Section 5305-Statewide Transportation Planning Program**: Funds and procedural requirements for statewide multi-transportation planning.
- **Section 5307-Urbanized Area Formula Program**: Funds for transit activities (capital, planning access to employment, operating expenses) in urbanized areas exceeding 50,000 in population.
- **Section 5309-Capital Investment Program**: Funds to assist in completing transit capital improvements such as new or expanded bus transit service.
- **Section 5310-Enhanced Mobility of Seniors and Individuals with Disabilities Program**: Funding program designed to meet the needs of certain transit-dependent populations in rural and/or urbanized areas.
- **Section 5339-Bus and Bus Facilities**: Funds for purchasing replacement transit equipment and to construct transit facilities.

Local Funding Programs

A number of local funds are drawn upon to assist in funding Federal-aid transportation projects within the AAMPO region. These local funding sources fall into two categories—Bond Proceed Funds and City Funds—and comprise a significant share of the annual funds that are used for transportation projects. Note that these Local funding figures reflect only amounts programmed for matching Federal-aid projects. Additional local funds have been used on local transportation projects not reflected in past TIPs.

- **Bond Proceed Funds**: General obligation and TIF-abated general obligation bonds make up the local bond proceed funds for the MPO.
- **City Funds**: City funds consists of road use taxes, local option sales tax (LOST) revenues, local transit fund, parking reserve fund, airport construction fund, and utility water, electrical, sewer, stormwater) funds.
- **Miscellaneous Funding Sources**: City assessments and similar sources

Other Funding Programs Available to AAMPO

In addition to the Federal, state, and local programs that AAMPO has historically received funding from, there are other sources that provide funding that is available to the MPO. These sources include:

Federal Sources:

- **Recreational Trails Program (Federal)**: Federal funding to provide and maintain motorized and non-motorized recreational trails and trail-related projects.
- **STBG-Highway Bridge Program (STBG-HBP)**: Federal funding for the replacement or rehabilitation of a structurally-deficient or functionally obsolete bridge on a public roadway. This program is funded through a set-aside of the state's annual STBG funding.
- **Highway Safety Improvement Program (HSIP)**: Federal funding for projects that aim to reduce traffic fatalities and serious injury crashes on all public roads, including non-State owned roads and roads on tribal lands.

State Sources:

- **Revitalize Iowa's Sound Economy (RISE)**: State funding to promote economic development through the construction or improvement of roads and streets. Funding is disbursed to any Iowa city or county through the form of either a grant, loan, or combination of both. Projects funded under RISE program must involve the construction or improvement of a public road.
- **Recreational Trails Program (State)**: State funding to fund public recreational trails.
- **Traffic Safety Improvement Program (TSIP)**: State funding for traffic safety improvement or safety study projects on any public road, including county roads, city streets, state highways, state parks, and institutional roads.
- **Urban-State Traffic Engineering Program (U-STEP**): Funding to assist in solving traffic operation and safety problems on primary roads in Iowa cities. Eligible projects must involve a municipal extension of a primary road. The match is 45% local and 55% state.
- **Statewide TAP**: State-administered funding for regional projects that address regional priorities. This funding source uses a portion of the state's annual STBG-TAP funding and disburses it to local jurisdictions while removing some of the requirements that come with STBG-TAP funding, thus allowing for a more flexible source of funding.

Federal and State Swap Programs

Iowa DOT administers a Federal-aid swap program, in which Federal transportation dollars are swapped with the state's Primary Road Funds, for all MPO road and bridge projects eligible under the program policy[21]. The swap program does not require a local match and these funds can be spent on roads classified as rural minor collectors. The Federal programs for which funds can be swapped are:

- **Surface Transportation Block Grant (STBG)**
- **Congestion Mitigation and Air Quality Improvement (CMAQ) / Iowa Clean Air Attainment Program (ICAAP)**
- **Highway Safety Improvement Program (HSIP)**
- **County Bridge Program**
- **City Bridge Program**

[21] Iowa Department of Transportation, Federal-Aid Swap Policy. https://iowadot.gov/local_systems/Federal-aid-swap-policy.pdf

All MPOs and Regional Planning Affiliations (RPA's) are assumed to be participants of the swap program, unless their policy board declines. AAMPO is a participant in the swap program.

MPO Roadway and Bicycle/Pedestrian Historical Funding Levels

Projects programmed in the 2010 through 2020 TIP documents were reviewed and categorized by funding source in **Table 5-1**. The funding levels shown in the table were normalized to 2020 dollars based on an assumed 4.5% increase in annual construction costs. These funding levels were normalized to account for changes in transportation construction costs over time, and to allow for a better understanding of historical funding levels in the context of current year dollars.

Spending for federal-aid eligible roadway and bicycle/pedestrian projects totaled almost $104 million over the 11-year period while the average total funding level for each year was $4.9 million. The non-STBG/TAP funding sources presented in **Table 5-1** are considered "discretionary" programs and are not guaranteed annually. The forecasted future funding levels discussed in this section are based on historical averages and it is possible that actual future funding from these discretionary sources may not reflect the projections presented below.

Table 5-1: MPO TIP Funding ($ 1000's) by Program Source, 2010-2020 ($ 2020)

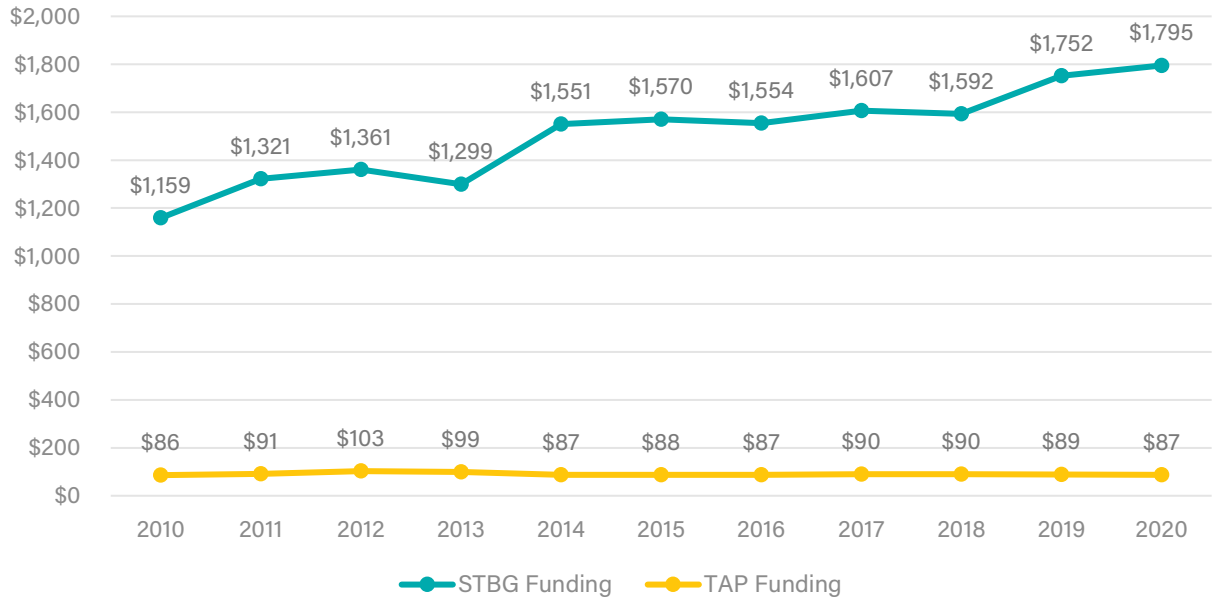
Program	Federal	Local	State	Total
STP/STBG	$16,562	$17,658	$9,137	$43,357
TE/TAP*	$4,432	$8,617	$1,746	$14,795
NHPP/NHS	$30,503	$118	$7,626	$38,247
ER	$205	$52	$0	$257
Primary Roads	$0	$0	$2,396	$2,396
Demonstration/Earmarks	$717	$178	$0	$895
ARRA	$998	$249	$0	$1,247
CMAQ	$304	$76	$0	$380
Illustrative Regional Projects	$0	$0	$2,396	$2,396
Total	$53,720	$26,949	$23,301	$103,970

Source: Ames Area MPO Transportation Improvement Programs, 2010-2020
**TE/TAP includes TAP Flex monies received during the period*

Historical Federal Funding Levels

Based on the review of past AAMPO TIP documents, historic STBG and TAP funding levels were identified for the years 2010-2020. These funding levels are presented in **Figure 5-1**, and are based on the STBG and TAP targets published in the corresponding year's TIP document.[22]

Figure 5-1: Historical STBG and TAP Funding Levels ($ 1000's) for the Ames Area MPO



Source: Ames Area MPO Transportation Improvement Programs, 2010-2020 and Iowa DOT

[22] Historic funding levels shown in YOE assume a 1.5% compounded annual budget increase.

Table 5-2 contains the total amounts of funding received from Federal programs between 2010 and 2020. The table includes the average annual funding level in year of expenditure (YOE) dollars as well as the annual average normalized to 2020 dollars. **Table 5-3** shows the historic levels of Federal funding sourced from FTA programs.

Table 5-2: Historical Funding Levels ($ 1000's) from Federal Sources, 2010-2020

	Formula-Based			Discretionary	
Year	STBG	TAP	TAP-Flex**	NHPP	CMAQ*
2010	$1,159	$86	$0	$0	$0
2011	$1,321	$91	$0	$0	$0
2012	$1,361	$103	$0	$0	$0
2013	$1,299	$99	$0	$0	$0
2014	$1,551	$87	$32	$0	$0
2015	$1,570	$88	$32	$0	$1,039
2016	$1,554	$87	$33	$0	$1,131
2017	$1,607	$90	$35	$0	$1,877
2018	$1,592	$90	$34	$3,431	$689
2019	$1,752	$89	$34	$0	$0
2020	$1,795	$87	$33	$0	$0
Average YOE	$1,506	$91	$33	$312	$431
Average 2020 $	$1,615	$98	$35	$321	$454

Source: Ames Area MPO Transportation Improvement Programs, 2010-2020
**CMAQ funding includes ICAAP funds received by AAMPO during this time period*
***TAP-Flex funding was not available until 2014*

Table 5-3: Historical FTA Funding ($ 1000's), 2010-2020

Year	Section 5303	Section 5307	Section 5309	Section 5310	Section 5339
2010	$28	$1,500	$34,823	$179	$160
2011	$30	$1,528	$28,638	$182	$0
2012	$20	$1,700	$5,545	$183	$0
2013	$31	$1,700	$5,785	$184	$0
2014	$0	$2,000	$2,550	$223	$2,958
2015	$0	$2,100	$430	$231	$5,984
2016	$0	$2,100	$0	$245	$3,094
2017	$0	$2,100	$600	$381	$3,557
2018*	$0	$2,184	$4,300	$390	$4,730
2019	$0	$2,406	$0	$268	$3,354
2020	$0	$3,455	$0	$268	$5,962
Average YOE$	$**	$2,070	$7,515	$249	$2,709
Average 2020 $	$**	$2,210	$8,558	$265	$2,828

Source: Ames Area MPO Transportation Improvement Programs, 2010-2020
**Data for 2018 based on FY 2017-2020 TIP.*
***Note that funding for Section 5303 ended after 2013.*

Historic Local Funding Levels

Table 5-4 presents historical funding levels for non-Federal road funds received by the Cities of Ames and Gilbert. These funds include the Local receipts from the RUTF, Other Road Monies, and Bond Proceed Funds. Note that the local funds shown in **Table 5-4** do not reflect all local funds for transportation investments, just those funds shown in past TIPs for Federal-aid projects.

Table 5-4: Historic Local Revenue Levels ($ 1000's), 2010-2020

Year	City of Ames			City of Gilbert		
	RUTF	City Funds	Bond Proceed Funds	RUTF	City Funds	Bond Proceed Funds
2010	$4,422	$5,400	$4,893	No Data Available		
2011	$5,013	$5,488	$5,990			
2012	$5,547	$4,780	$6,500	$103	$3	$0
2013	$5,717	$4,032	$5,988	$104	$17	$0
2014	$5,860	$4,598	$6,200	$108	$15	$0
2015	$6,283	$4,291	$9,240	$113	$13	$0
2016	$7,229	$8,531	$9,939	$134	$30	$0
2017	$7,535	$6,555	$5,195	$134	$34	$0
2018	$7,322	$8,476	$7,521	$138	$15	$0
2019	$7,664	$5,548	$6,850	$140	$23	$0
2020*	$7,430**	$5,770*	$8,320	$146*	$24*	$0
Average YOE $	$6,366	$5,770	$6,967	$124	$19	$0
Average 2020 $	$6,813	$6,190	$7,476	$132	$20	$0

Source: Ames Area MPO Transportation Improvement Programs (2010-2021), City of Ames Program Budgets (2010-2021), City of Ames Capital Improvements Plans (2010-2020)

**2020 Revenue levels were projected based on 2019 levels at an assumed growth of 4%*

***Based on 2019-2020 Adjusted Budget from 2020-21 Program Budget Document*

Operations and Maintenance

Operations and Maintenance (O&M) is an annual expenditure for the Cities of Ames and Gilbert that is funded with STBG monies in addition to the RUTF, LOST, and GO funds. **Table 5-5** shows the historical O&M expenditures for the Cities of Ames and Gilbert for both the Federal-Aid and Non-Federal-Aid systems.

Table 5-5: City of Ames and City of Gilbert Operations and Maintenance Expenditures ($ 1000's), 2010-2020

Jurisdiction		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020*	Average YOE $	Average 2020 $
City of Ames	Federal-Aid Operations	$486	$403	$296	$448	$498	$467	$324	$600	$662	$847	$881	$537	$572
	Federal-Aid Maintenance	$927	$1,175	$1,110	$889	$1,084	$1,075	$1,142	$1,530	$1,330	$1,565	$1,628	$1,223	$1,309
	Non-Federal-Aid Operations	$1,585	$1,312	$964	$1,360	$1,513	$1,429	$977	$1,787	$1,967	$2,448	$2,546	$1,626	$1,736
	Non-Federal-Aid Maintenance	$3,021	$3,834	$3,621	$2,700	$3,292	$3,293	$3,445	$4,561	$3,952	$4,521	$4,701	$3,722	$3,991
City of Gilbert	Federal-Aid Operations	No Data Available		$1	$1	$2	$2	$1	$8	$9	$5	$5	$4	$4
	Federal-Aid Maintenance			$12	$15	$23	$11	$13	$8	$8	$6	$6	$11	$12
	Non-Federal-Aid Operations			$6	$6	$11	$8	$8	$42	$48	$26	$32	$21	$22
	Non-Federal-Aid Maintenance			$69	$76	$120	$65	$73	$46	$47	$34	$42	$64	$68
Total O&M Spending		$6,070	$6,759	$6,079	$5,495	$6,543	$6,350	$5,983	$8,582	$8,023	$9,452	$9,842	$7,216	$7,723

Source: Ames Area MPO Transportation Improvement Programs, 2010-2020
**2020 O&M levels were projected based on 2019 levels at assumed growth of 4%*

Future Year Forecasts

Federal Funding Programs

The amounts of federal funding—formula-based and discretionary—available to the MPO between 2010 and 2020 were forecasted out to the year 2045 and categorized into the three time periods discussed in the beginning of this report, based on an assumed annual growth of 1.5% beyond the 2020-2023 TIP. **Table 5-6** presents the resulting forecasted funding levels by time period.

As seen in the table, STBG funding is estimated to total $47 million between 2025 and 2045 while TAP funds are anticipated to equal just over $2 million. Based on the annual average of $33,000 in STBG funding that is flexed to TAP, it is estimated the MPO will flex a total of $870,000 between 2025 and 2045. AAMPO is anticipated to receive almost $8.5 million in NHPP funds and $12 million in CMAQ funding during the 20-year planning period.

Table 5-6: Future Year Federal Funding Level Forecasts by Time Period ($ 1000's)

Time Period/Years		STBG	TAP	TAP Flex	NHPP	CMAQ
Current TIP	2021-2024	$6,783	$348	$132	$15,637	$2,647
Short-Term	2025-2029	$9,780	$485	$183	$1,784	$2,519
Mid-Term	2030-2037	$17,245	$855	$323	$3,145	$4,442
Long-Term	2038-2045	$19,426	$964	$364	$3,543	$5,004
Total*		$46,451	$2,304	$870	$8,472	$11,965

Source: Ames Area MPO Transportation Improvement Programs, 2010-2020
**Totals only reflect Short-, Mid-, and Long-Term projections as funds in the current TIP are programmed*

Local Funding Programs

Local non-Federal aid revenues and O&M costs were forecasted through the planning horizon year 2045, based on an assumed annual 1.5% growth factor**.** For non-Federal aid revenue sources, the amount received in FY2020 was used as the basis for the forecast except for the Bond Proceed fund. This revenue source forecast used the historic average for the years 2010-2020 normalized to 2020 dollars, to account for the historic volatility associated with it.

The resulting forecasts in **Table 5-7** show that the estimated amount of non-Federal aid revenue (comprised of the RUTF, City funds, and Bond Proceed funds) for the Cities of Ames and Gilbert is expected to total over $570 million during the 20 year period, while total

O&M costs are anticipated to be around $200 million over this same period. Based on these projections, the local revenue in excess of local O&M costs is anticipated to be roughly $374 million between 2025 and 2045.

Table 5-7: Forecasted Local Revenue and O&M Costs ($ 1000's) for the Cities of Ames and Gilbert by Time Period

	TIP Years (2021-2024)	Short-Term (2025-2029)	Mid-Term (2030-2037)	Long-Term (2038-2045)	Total*
Non-Federal Aid Revenue	$130,992	$120,389	$212,273	$239,123	$571,785
Total Maintenance Costs	$15,210	$29,003	$51,139	$57,607	$137,749
Total Operations Costs	$15,168	$12,649	$22,304	$25,125	$60,078
Revenue in Excess of O&M	$100,613	$78,737	$138,833	$156,391	$373,958

**Totals shown only reflect the Short-, Mid-, and Long-Term forecasted revenues and costs*

System Preservation and Improvement Spending Comparison

To allocate projected future funds to meet the needs of both preserving and improving the transportation system, a review of the historical spending breakdowns of preservation and improvement projects was conducted. The TIP documents for the years 2010 through 2020 were reviewed to establish a basis for the funding requirements for AAMPO's roadway and bicycle and pedestrian systems. Program costs were delineated into two main project categories:

System Preservation: Projects that improve existing infrastructure, such as reconstruction, rehabilitation, resurfacing, and operations and maintenance.

System Improvements: Projects that expand the existing system through the construction of new corridors, bridges, lane widenings, turn lanes, etc.

This historical analysis was supplemented with an understanding of the future pavement and bridge preservation requirements on the system to meet system performance requirements. This will require a greater portion of future roadway funding to go towards system preservation. **Table 5-8** presents the historic breakdown of funding for project categories by mode.

Table 5-8: Historic System Improvement and System Addition Spending Breakdowns

	System Preservation	System Improvement
MPO Roadway Funding	60%	40%
Local Roadway Funding[23]	80%	20%
MPO Bicycle and Pedestrian Funding	20%	80%
Local Bicycle and Pedestrian Funding	30%	70%

Source: Ames Area MPO Transportation Improvement Programs, 2010-2020

The resulting Federal funding levels for preservation and improvement projects are shown in **Table 5-9.** The local funding levels for local preservation and improvement projects (including the improvement spending by Federal-Aid and Local system roads) are shown in **Table 5-10**. The table shows local funding for roadway and bicycle and pedestrian projects based on the breakdowns in **Table 5-9**, and assumes 90% of available local funds are spent on roadway projects while the remaining 10% is spent on bicycle and pedestrian projects.

Table 5-9: Formula-Based Federal Funding Levels for System Preservation and System Improvement Projects

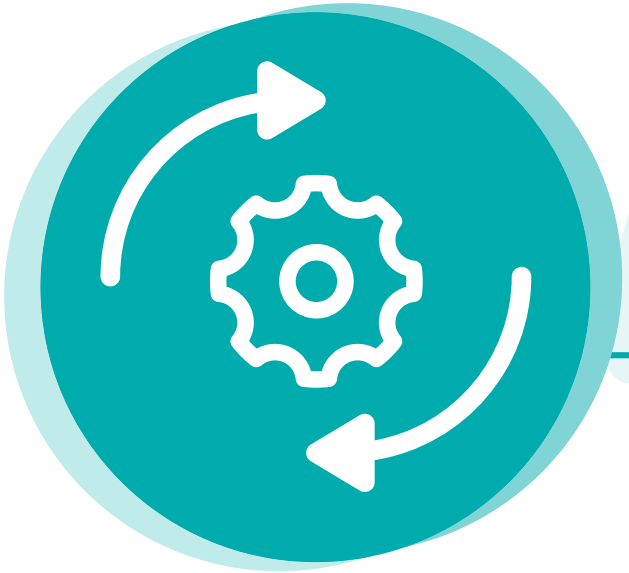
Time Period/Years		STBG		TAP		TAP Flex	
		System Preservation	System Improvement	System Preservation	System Improvement	System Preservation	System Improvement
Short-Term	2025-2029	$5,868	$3,912	$97	$388	$37	$146
Mid-Term	2030-2037	$10,347	$6,898	$171	$684	$65	$258
Long-Term	2038-2045	$11,656	$7,770	$193	$771	$73	$291
Total*		$27,871	$18,580	$461	$1,843	$175	$695

[23] Of the locally-funded roadway projects, 60%of funding went to the Federal-aid roads and 40% of funding went to non-Federal-aid roads.

Table 5-10: Local Funding Levels for System Preservation and System Improvement Projects

Time Period/Years		Non-Federal Aid Revenue*				
		Bike / Pedestrian Funding		Roadway Funding		
					System Improvement	
		System Preservation	System Improvement	System Preservation	Fed Aid System	Local System
TIP Years	2021-2024			$68,417	$19,318	$12,878
Short-Term	2025-2029	$2,362	$5,512	$56,691	$8,503	$5,669
Mid-Term	2030-2037	$4,165	$9,718	$99,960	$14,994	$9,996
Long-Term	2038-2045	$4,692	$10,947	$112,602	$16,890	$11,260
Total*		$11,219	$26,177	$269,253	$40,387	$26,925

**Revenues shown are based on the Revenues in Excess of O&M Spending in Table 5-7*



Chapter 6
Alternatives Development and Evaluation

Chapter 6 **Alternatives Development and Evaluation**

Public input received during the engagement activities for this MTP and projects presented in past plans and studies for the AAMPO region served as the basis for the development of project and policy alternatives for inclusion in Forward 2045. The past plans and studies that were reviewed include:

- Ames Mobility 2040 Long Range Transportation Plan
- 2020-2024 Transit Development Plan
- 2018 Lincoln Corridor Plan
- 2020 Passenger Transportation Plan
- 2018 Complete Streets Plan

Projects screened during the alternatives development process were categorized by mode—roadway, bicycle and pedestrian, and transit—before being reviewed for consistency with the MTP's goals and objectives, and how well they align with the prioritization metrics shown in **Table 6-1**. An additional factor considered in the screening process was context, meaning how well the project would perform in the providing desired transportation service levels, as well as how well the project fits into the surrounding built and natural environment.

Strategy Development and Prioritization Process

The initial phase of the strategy development and prioritization process was to evaluate potential projects against the goals and objectives presented in **Chapter 1**. After this evaluation, the projects were screened against the project-level metrics shown in **Table 6-1**, which were developed under a performance-based approach tied to the MTP's goals and regional performance measures.

In addition to the public input and connection the MTP goals and objectives, the project scoring metrics were developed to reflect the planning efforts of the Iowa DOT in the State Transportation Asset Management Plan (TAMP), the Strategic Highway Safety Plan (SHSP), and the State Freight Plan (SFP).

- The State TAMP is supported in the alternative project scoring process through the promotion of financially sustainable projects as well as prioritizing projects that minimize impacts on the environment and natural resource areas of the region. The MPO has also set aside sufficient funding levels to continue investing in current transportation assets to maintain them within established performance measures. In addition to bridge and pavement investments, CyRide proactively plans for vehicle replacements through the MPO's annual Transportation Improvement Program process. Future updates to the AAMPO MTP will need to incorporate the goals and objectives of the MPO's forthcoming Public Transportation Agency Safety Plan (PTASP), which establishes safety planning for public transit agencies who receive Federal funding. The compliance deadline for the PTASP has been extended from July 20, 2020 to December 31, 2020 due to the COVID-19 public health emergency.
- Consideration of the SHSP performance measures, which included a reduction in fatal and serious injury crashes and crash rates, were integrated into this process by giving higher scores to projects that addressed both vehicular and non-motorized safety at the top crash intersections discussed in **Chapter 3**.
- The alternatives scoring metrics address the SFP through the prioritization of projects that have potential to improve freight reliability on Interstate corridors. The specific measure related to the SFP looks at existing Truck Travel Time Reliability (TTTR) indexes on the Interstate system; any project that has potential to improve future TTTR receives a higher project score.

Table 6-1: Alternative Project Scoring Criteria

Goal	Objective	Scoring Approach			
		+2	**+1**	**0**	**-1**
Accessible					
	Improve walk, bike, and transit system connections	Creates or improves connection between two or more modes	Creates or improves connections for non-motorized or transit modes	No impact on connectivity for non-motorized or transit modes	Non-motorized or transit connection is removed, or barrier to non-motorized or transit modes is created
	Improve bicycle and pedestrian access to CyRide routes				
	Provide appropriate arterial, collector, bicycle, pedestrian, and transit corridor spacing	New Multimodal network connection where a gap of ½ mile or more existing before.	Provides a new connection between two existing facilities, or an extension of an existing facility	-	-
	Provide improved access to transit for transit dependent, disabled, and disadvantaged populations	Improves transit accessibility in identified EJ area	-	Does not impact transit accessibility in identified EJ area	Removes or creates barriers to transit accessibility in identified EJ area
	Incorporate bicycle, pedestrian, and transit-friendly infrastructure in new developments	Extends a bike, pedestrian, or transit corridor closer to an identified future development growth area.	-	Does not extend a bike, pedestrian, or transit corridor closer to an identified future development growth area.	Reduces facility connectivity.
Safe					
	Reduce number and rate of crashes	Has the potential to improve safety at top crash frequency or crash rate intersection	Has the potential to improve safety at any intersection	Does not impact safety at top crash frequency or crash rate intersection	Has the potential to negatively impact safety
	Reduce number and rate of serious injury and fatal crashes				
	Reduce the number of bicycle and pedestrian crashes	Has the potential to improve non-motorized safety at top crash frequency or crash rate intersection	Has the potential to improve non-motorized safety at any intersection	Does not impact non-motorized safety at top crash frequency or crash rate intersection	Has the potential to negatively impact non-motorized safety
	Prioritize projects that improve the Ames Area Safe Routes to School Program	Creates or improves connection to Safe Route to School network for two or more modes	Creates or improves connection to Safe Route to School network	No impact on connectivity to Safe Routes to School network	Removes or creates barrier to Safe Routes to School network

Table 6-1. con't.

Goal	Objectives	Scoring Approach			
		+2	+1	0	-1
Sustainable					
	Reduce transportation impacts to natural resources	Is not located in an identified natural resource area	-	Is located in an identified natural resource area	-
	Limit transportation system emissions of greenhouse gases	Provides a significant reduction system-wide in VMT and VHT	Provides significant reduction system-wide in either VMT or VHT	Does not significantly impact system-wide VMT or VHT	Increases system-wide VMT and VHT
	Make transportation infrastructure more secure, and resilient to natural and manmade events	Project would reduce flooding risk for corridor.	-	Project would have no impact on flooding risk for corridor.	Project would increase flooding risk for corridor.
	Promote financially sustainable transportation system investments	Technology or management strategies on existing infrastructure	Minor system enhancements to existing infrastructure (e.g. turn lanes, protected bike lanes/side path)	Major system enhancements to existing infrastructure or new trails (e.g. roadway widening)	New transportation infrastructure (e.g. new corridor)
Efficient and Reliable					
	Identify context-sensitive strategies and projects that improve traffic flow in corridors with high levels of peak period congestion (LOS D or worse)	Improves LOS in corridor estimated to have LOS D or worse in 2045	Improves LOS	Does not impact LOS	Degrades LOS a letter grade or worse
	Maintain acceptable travel reliability on Interstate and principal arterial roadways	Has potential to improve reliability on an NHS corridor identified as having reliability issues	Has potential to improve reliability on an NHS corridor	Does not impact LOTTR	Worsens LOTTR on a NHS corridor
	Provide frequent transit service to high trip generation locations	Improves transit frequency in identified high trip location	-	Does not impact transit frequency in identified high trip location	Worsens transit frequency in identified high trip location
	Increase the regional share of trips made by walking, biking, and transit	Major Increase to mode share for walking, biking, and/or transit	Slight Increase to mode share for walking, biking, and/or transit	Does not impact mode share for walking, biking, or transit	Reduces mode share for walking, biking, and/or transit
	Improve freight system reliability	Has potential to improve freight reliability on Interstate corridor identified as having freight reliability issues	Has potential to improve freight reliability on Interstate corridor	No expected impact to freight reliability on Interstate corridor	Has potential to worsen freight reliability on Interstate corridor
	Identify technology solutions to enhance system operation	Includes technology element that more effectively manages system operation	-	Does not include technology element	-

Table 6-1 con't.

Goal	Objectives	Scoring Approach			
		+2	**+1**	**0**	**-1**
Placemaking					
	Increase the percentage of population and employment within close proximity to transit and/or walking and biking system.	Creates new, multi-modal connection between highest tier of dense / diverse land use.	Creates new, multi-modal connection between second highest tier of dense / diverse land use.	Does not create new, multi-modal connection to dense / diverse land use.	Removes multi-modal connection to dense / diverse land use.
	Provide transportation strategies and infrastructure that support current adopted plans	Project is proposed by other plan or would support neighborhood or district development goals.	-	Project is not included in other plans and is neutral in relation to neighborhood or district development goals.	Project is not included in other plans and would negatively impact neighborhood or district development goals.

Potential Alternatives

Alternative projects identified through public feedback, input from AAMPO staff, and the technical analyses described in **Chapter 4** and **5** covered a range of strategies for the roadway, bicycle and pedestrian, and transit systems within the region. Examples of these strategies for each mode are described below.

Roadway Projects

Roadway projects were primarily developed to address areas with higher potential for future traffic congestion, improve vehicular and non-motorized safety, reduce environmental impacts, and encourage greater multi-modality. The roadway alternatives were developed to adequately balance system preservation projects with system improvement projects while remaining within the funding levels identified in **Chapter 5**. Examples of roadway projects identified through the alternatives development process include:

New Corridors: These projects would construct new roadways.

Source: FHWA

Widenings: These projects would add additional lanes to existing roadways, i.e. convert a 2-lane road to 4 lanes.

Source: Omaha World Herald

Turn Lanes: These projects would construct turn lanes (either left or right) at intersections to facilitate improved through traffic flow due to the removal of vehicle queuing.

Source: FHWA

Road Diet: Road diets remove a travel lane from a 4-lane, undivided roadway and convert it to 3-lane roadway with 2 through lanes and a center turn lane. This roadway configuration improves safety while sometimes offering opportunities for bicycle and pedestrian and transit facilities.

Source: Virginia DOT

Grade Separation: Grade separations construct an underpass or overpass that separates vehicular traffic from barrier such as an Interstate or railroad. These projects reduce travel delay as conflicts at these barriers are removed.

Source: UPPR

Traffic Signals: These projects would install traffic signals at higher-volume intersections that are currently uncontrolled, or upgrade existing traffic signals to leverage new technologies that facilitate improved traffic management solutions.

Source: FHWA

Roadway System Management Strategies

In addition to the alternative strategies for the roadway system discussed above, several operational and management strategies could be pursued by the AAMPO to maximize operational abilities of the existing roadway system while improving safety and mobility. These strategies, referred to as Transportation System Management and Operations (TSMO), are more cost-effective than traditional projects that add capacity to the system and aim to address congestion issues beyond recurring peak hour congestion. TSMO strategies fall into three categories:

- **System Performance Monitoring**: Use of real-time data and information to guide regional transportation decision making based on data analytics and information management systems. Examples of system performance monitoring include Transportation Management Centers (TMCs), and Dynamic Message Signs (DMS) that provide travelers real time information to help with trip planning.
- **Management of Recurring Issues**: Strategies that addresses recurring, and thus, predictable congestion issues in the region. These include freeway and arterial management strategies, traffic signal operational planning, and demand management for bicycle and pedestrian users.
- **Management of Non-Recurring Issues**: Non-recurring issues are not easy to plan for as they are typically unpredictable. To best prepare for them, the AAMPO can consider strategies such as Traffic Incident Management (TIM), Road Weather Management, Work Zone Management, and Special Event Management.

Bicycle and Pedestrian Projects

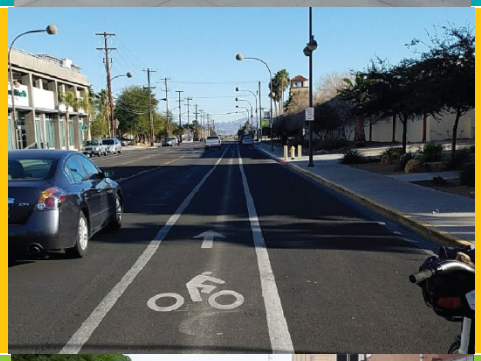
Bicycle and pedestrian projects screened during the alternatives development process sought to provide improved connections between existing bicycle and pedestrian facilities while strengthening the multi-modal nature of the AAMPO region, improving non-motorized safety, reducing environmental impacts, and providing bicycle and pedestrian facilities in areas with denser, and more diverse land uses. Some of the project types screened were:

Crossing Improvements: Examples of crossing improvement projects include improved intersection markings, pedestrian signals, and treatments to improve visibility.

Source: San Francisco Metropolitan Transportation Authority

Bike lanes: These projects would construct dedicated lanes in the roadway for exclusive use by bicyclists.

Source: City of Fort Lauderdale, FL



Protected bike lanes: Protected bike lanes provide an exclusive lane for bicyclists within the roadway while using a physical barrier to separate bicycle traffic from vehicular traffic.

Source: City of Burlington, VT

Bicycle Boulevards: Bicycle boulevard projects would install signage, markings, and traffic calming measures so low volume and low speed roads can give priority use to bicyclists.

Source: City of Berkeley, CA

Shared-Use Path: These projects would construct new off-street trails, or extend existing off-street trails, for use by bicyclists and pedestrians.

Source: Iowa DOT

Shared streets/pedestrian mall: Shared street projects would convert existing roadway cross sections to a more informal setting for vehicles and pedestrians on roads with low volumes and speeds. Shared streets prioritize pedestrian movements and limit/prohibit through vehicle movements.

Source: NACTO

Bicycle and Pedestrian Facility Selection

Bike Facilities

There are many types of bikeways, including bike lanes, routes, and off-street paths. The appropriate type of bikeway for a given street depends on the characteristics of the roadway and the desired level of comfort for people bicycling.

Conventional guidance recognizes three general types of potential riders based on their likelihood to utilize a particular type of bicycle facility. These rider types are:

- Strong and Fearless: Confident and comfortable riding intermixed with other modes in all contexts
- Enthused and Confident: Comfortable riding in many contents, prefers designated bikeways
- Interested, but Concerned; Would like to ride, but primarily concerns about safety and therefore rides less often or not at all.

The *Interested, but Concerned* group includes children, older adults, people new to riding a bicycle, and those who prefer as much separation as possible between themselves and motor vehicles. The national best practice for creating a comfortable and appealing bike network is to design for "All Ages and Abilities"—in other words, to design facilities so that *Interested, but Concerned* riders will feel comfortable using them. Building bicycle infrastructure that meets this criteria is an essential strategy for cities seeking to improve traffic safety, reduce congestion, improve air quality and public health, provide better and more equitable access to jobs and opportunities, and bolster local economies.

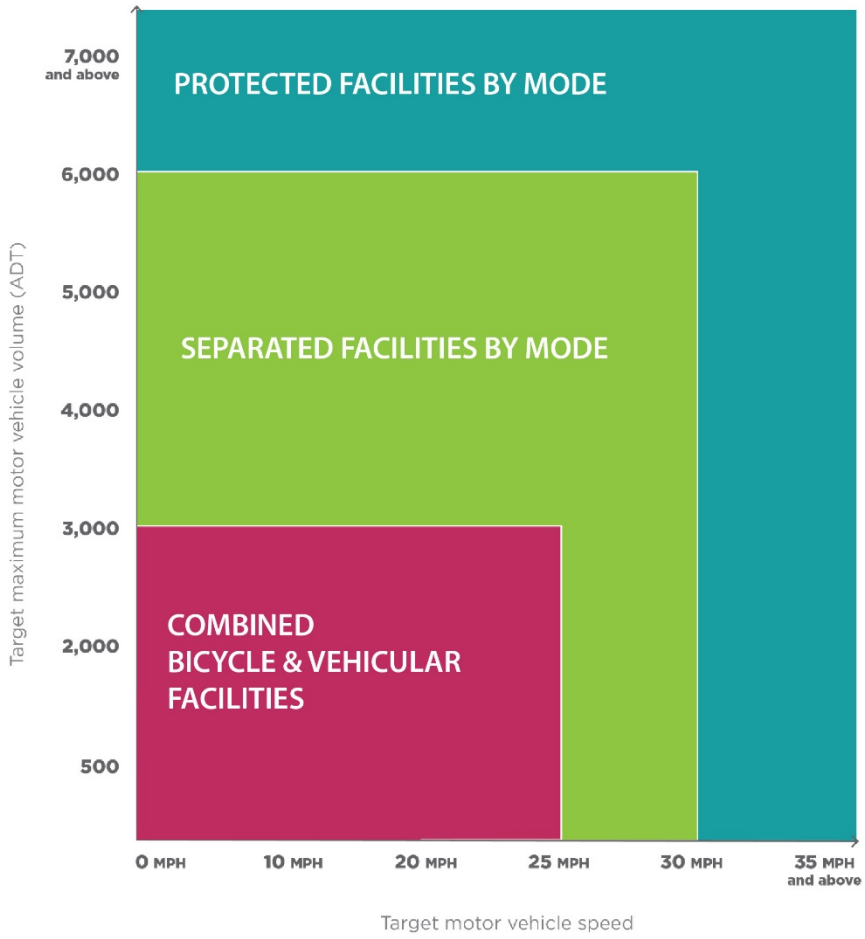
Bikeway Selection Guidance

National guidance on selecting bike facilities to achieve a network suitable for All Ages and Abilities is available from several sources.

- **The Federal Highway Administration (FHWA) *Bikeway Selection Guide***
- **The American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities***
- **The National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide*** includes All Ages and Abilities facility selection and design guidance

Recommended bike facilities in Forward 2045 are based on FHWA guidance, which uses the daily volume of motor vehicle traffic and posted speed limit of the street to determine the appropriate bike facility, as illustrated in **Figure 6-1**.

Figure 6-1: FHWA Bikeway Selection Guidance



Pedestrian Crossings

Improvements to intersection design and the addition of mid-block crossings can go a long way to making walking a more comfortable and viable transportation option. A variety of proven countermeasures may be applied to increase safety for pedestrians crossing the street, including:

- High-visibility crosswalk markings
- Raised crosswalks
- Signs
- Curb extensions
- Pedestrian refuge islands
- Rectangular Rapid-Flashing Beacons (RRFBs)
- Road diets
- Pedestrian Hybrid Beacons

Countermeasure Selection Guidance

The FHWA PEDSAFE Pedestrian Safety Guide and Countermeasure Selection System provides a broad suite of information and tools to improve pedestrian safety and mobility. Forward 2045 uses the Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations as the basis for selecting potential design treatments for uncontrolled crossings in Ames. **Figure 6-2** shows the countermeasure options recommended by FHWA based on the posted speed limit, number of lanes, and average annual daily traffic of the street. These countermeasures are proven to reduce the number and severity of collisions involving people walking. The guide does not necessarily recommend applying all of the potential countermeasures listed in the corresponding cell of the table for any given location, but rather selecting those countermeasures that best fit the specific location.

Figure 6-2: Application of Pedestrian Countermeasures by Roadway Feature

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	❶ 2 4 5 6	❶ 5 6 7 9	① 5 6 ❼ ❾	❶ 4 5 6	❶ 5 6 7 9	① 5 6 ❼ ❾	❶ 4 5 6 7 9	① 5 6 7 9	① 5 6 ❾
3 lanes with raised median (1 lane in each direction)	❶ 2 3 4 5 7 9	❶ ❸ 5 7 9	① ❸ 5 ❼ ❾	① 3 4 5 7 9	① ❸ 5 ❼ ❾	① ❸ 5 ❼ ❾	① ❸ 4 5 7 9	① ❸ 5 ❼ ❾	① ❸ 5 ❾
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	❶ 2 3 4 5 6 7 9	❶ ❸ 5 6 7 9	① ❸ 5 6 ❾	① 3 4 5 6 7 9	① ❸ 5 6 ❼ ❾	① ❸ 5 6 ❾	① ❸ 4 5 6 7 9	① ❸ 5 6 ❾	① ❸ 5 6 ❾
4+ lanes with raised median (2 or more lanes in each direction)	❶ ❸ 5 7 8 9	❶ ❸ 5 7 8 9	① ❸ 5 8 ❾	① ❸ 5 7 8 9	① ❸ 5 ❼ 8 ❾	① ❸ 5 8 ❾	① ❸ 5 ❼ 8 ❾	① ❸ 5 8 ❾	① ❸ 5 8 ❾
4+ lanes w/o raised median (2 or more lanes in each direction)	❶ ❸ 5 6 7 8 9	① ❸ 5 ❻ 7 8 9	① ❸ 5 6 8 ❾	① ❸ 5 ❻ 7 8 9	① ❸ 5 ❻ ❼ 8 ❾	① ❸ 5 6 8 ❾	① ❸ 5 ❻ ❼ 8 ❾	① ❸ 5 ❻ 8 ❾	① ❸ 5 6 8 ❾

Given the set of conditions in a cell,

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- ● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- ○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
2 Raised crosswalk
3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
4 In-Street Pedestrian Crossing sign
5 Curb extension
6 Pedestrian refuge island
7 Rectangular Rapid-Flashing Beacon (RRFB)**
8 Road Diet
9 Pedestrian Hybrid Beacon (PHB)**

Transit Projects

Forward 2045 was developed through a multimodal approach, where interactions among the various modes of transportation in the MPO region were assessed and deficiencies identified. While the MTP presents specific candidate projects for the roadway and bicycle and pedestrian modes, the transit projects are aimed at describing capital and operational improvements that can further build upon the region's multi-modal connections while improving accessibility and mobility for residents.

Transit projects evaluated in the alternatives development process were based on the unique needs and funding programs of CyRide's fixed-route and paratransit systems. In addition to these needs and funding requirements, transit projects were assessed on their potential to improve transit access, especially for disadvantaged populations, and connectivity with other modes. Due to the nature of transit planning in the AAMPO region, fiscally constrained projects for the fixed-route and paratransit systems will not be identified but potential transit improvements will be. These improvements are described below:

Transit Signal Priority: Improve signal timings for transit vehicles to allow increased transit reliability and travel time.

Source: New York City Department of Transportation

Facility Improvements: Improvements for the Ames Intermodal Facility.

Source: Iowa State University Facilities Planning and Management

Transit-Oriented Development: Implementation of Transit-Oriented Development (TOD) in future redevelopments. TOD is a diverse mix of commercial, residential, office, and entertainment land uses located within close proximity to transit services.[24]

Source: Metro Transit (MN)

Technology-Based: Vehicle location tracking, passenger counting, and other technological solutions for improving transit planning and decision-making capabilities.

Source: Cincinnati Metro Transit

Alternatives Scoring Results

The alternative roadway and bicycle and pedestrian projects were scored based on how well they met the criteria shown in **Table 6-1** and ranked into three tiers—High, Medium, and Low. Projects receiving "High" scores are considered to best meet the current needs of the AAMPO transportation system, however, projects receiving "Low" scores are not considered to be poor projects. While "Low" scoring projects still address needs of the regional transportation system, they fail to meet a wide range of the goals and objectives of Forward 2045 relative to the higher scoring projects. **Figure 6-3** shows the resulting scores for the alternative roadway projects while **Figure 6-4** and **Figure 6-5** show the scores for the alternative bicycle and pedestrian projects. Refer to the **Appendix D** for the complete list of roadway and bicycle and pedestrian alternative projects.

For alternative roadway projects, the higher scoring projects were those that have the most potential to improve traffic operations and safety in areas that are projected to have congestion issues under the 2045 E+C scenario or are experiencing current safety issues, while minimizing impacts on the environment and remaining financially sustainable. The highest scoring bicycle and pedestrian projects were those that extended and/or connected the existing bicycle and pedestrian system with areas of denser, more diverse land uses while also minimizing environmental impacts and being financially sustainable. For bicycle and pedestrian projects, project numbers starting with "ON" refer to on-street facilities, while project numbers starting with "OFF" refer to off-street facilities. Crossing projects begin with "CR."

[24] Federal Transit Administration, https://www.transit.dot.gov/TOD

Figure 6-3: Alternative Roadway Projects by Scoring Tier

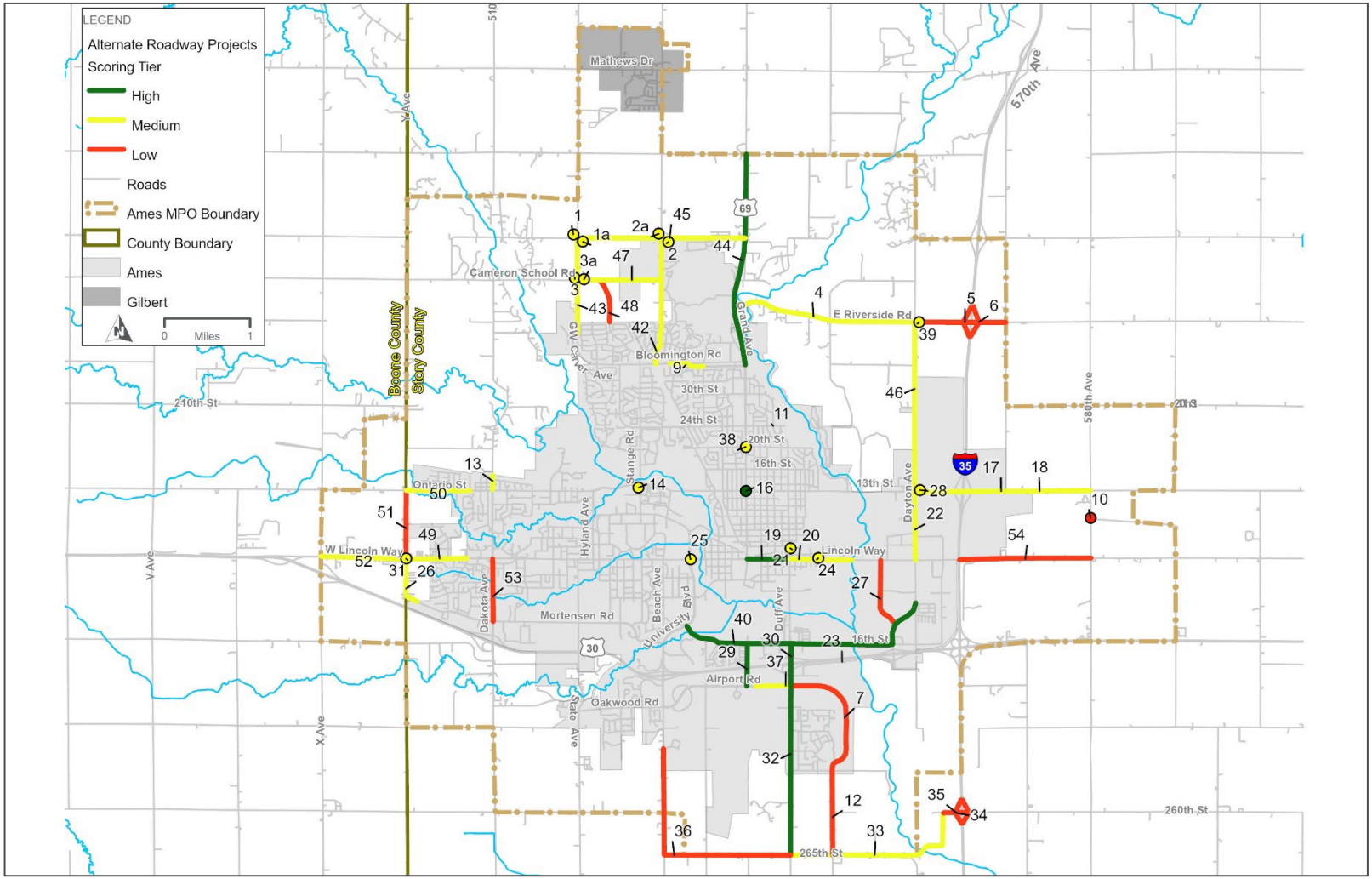


Figure 6-4: Alternative Bike and Pedestrian Projects by Scoring Tier

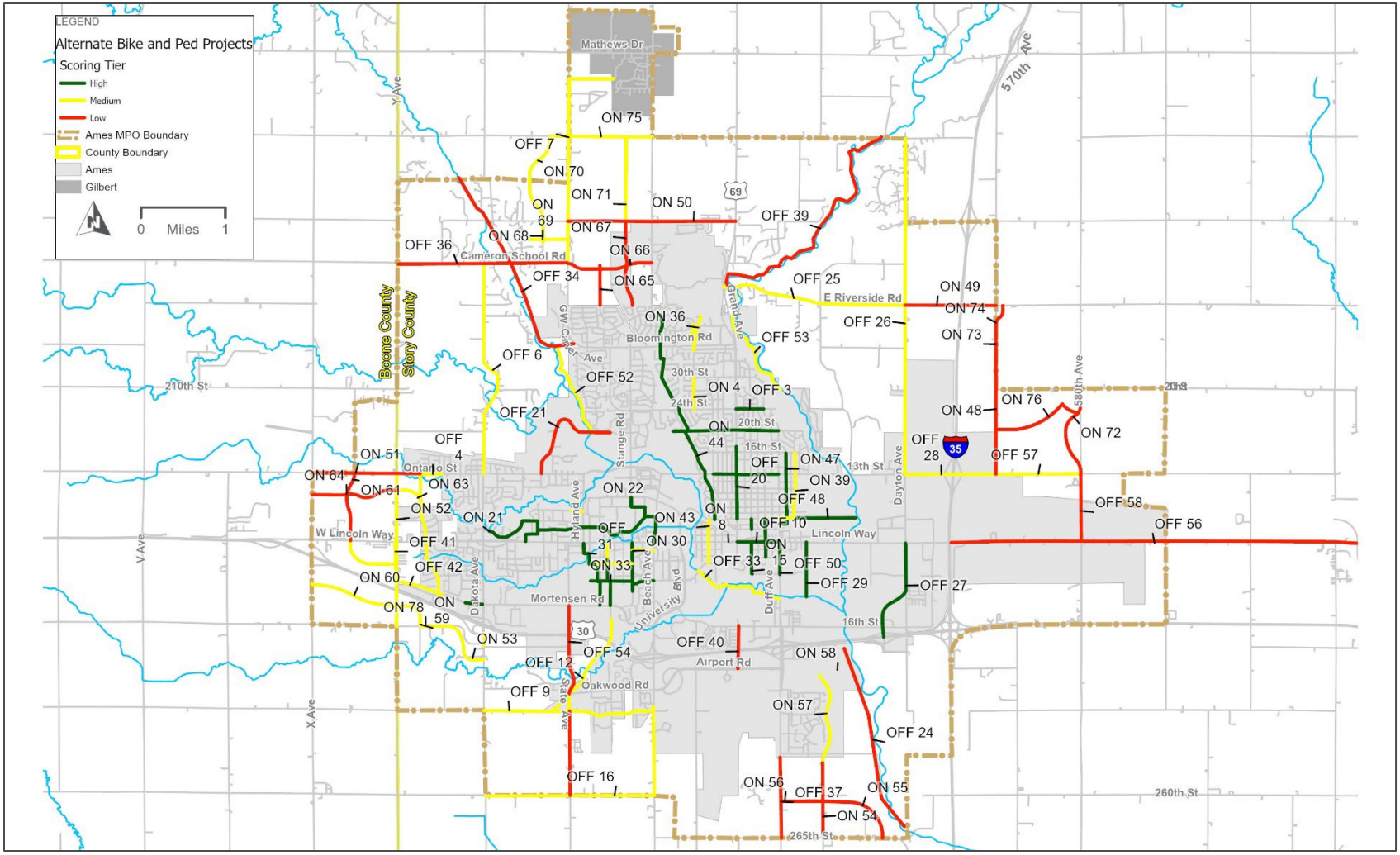
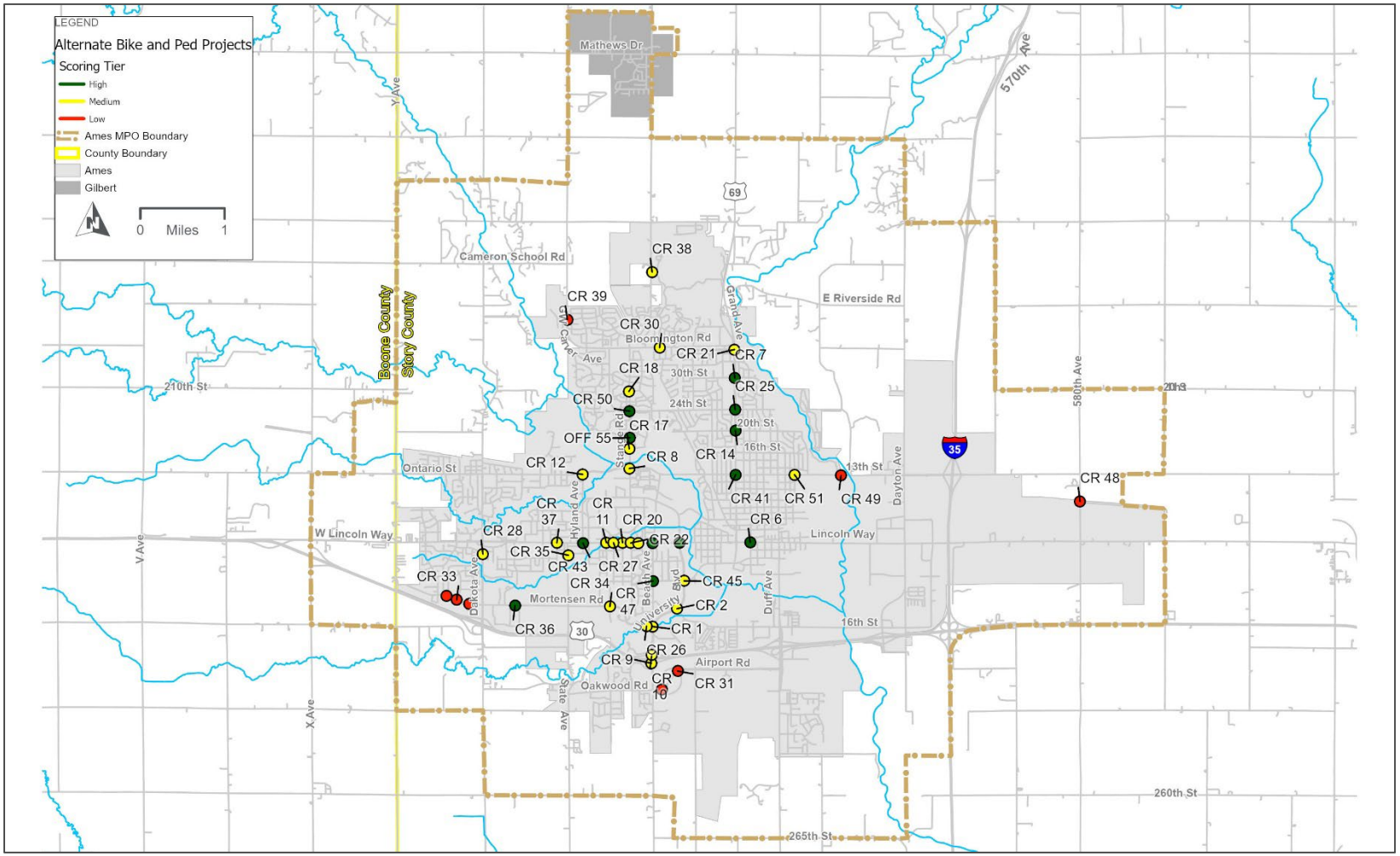


Figure 6-5: Alternative Bike and Pedestrian Crossing Projects by Scoring Tier



Emerging Trends and Technologies

Strategies and Treatments

The following is a list of potential influencing strategies and treatments that are likely to have the greatest impact in the coming years throughout the reach of the AAMPO:

- **Mobility as a Service (MaaS):** Facilitate an integrated mobility platform, capturing trip planning and payment across multiple modes to increase transportation access and decrease per-mile cost.
- **MaaS Parking Strategy:** Establish a "futureproofing" strategy for parking, considering autonomous vehicle impacts of decreased future parking demand and gained efficiencies based on self-parking vehicles.
- **Connected and Autonomous Vehicles (CAVs):** Prepare for the coming shift to autonomy by considering strategies encouraging shared mobility, reduction of vehicle miles travelled due to induced demand, and finding more efficiencies in the existing roadway network.
- **Autonomous Shuttles:** Establish autonomous shuttle pilot projects to test coordination with real-world roadway conditions and to familiarize the public with AV operations.
- **Smart Traffic Signal Controls and System Management:** Move traffic, pedestrians, bicyclists, and transit vehicles more efficiently on existing streets by coordinating traffic signals through vehicle-to-infrastructure and vehicle-to-vehicle communication.
- **Electrification / Charging Stations:** Accelerate the shift to low-emissions vehicles by providing access to a region wide system of charging stations.
- **5G / Communications:** Establish the communication backbone needed for the function of connected and autonomous vehicles and the links to smart infrastructure.
- **Micromobility:** Provide additional transportation options to complement the changing mobility network, particularly improving first-last mile access as well as opportunities for underserved populations.
- **Curb Management:** Anticipate the growing competition for limited curb space resulting from increases in shared mobility and urban freight delivery due to e-commerce and automation.
- **Robotic Delivery:** Respond to the rapidly growing e-commerce sector and prepare our roadway and sidewalk networks to accommodate ground-based robotic drone delivery vehicles.

Table 6-2 presents greater detail on these ten strategies, including their pros and cons, timeframe, and impact on Ames.

Table 6-2: Pros, Cons, Timeframe, and Impact of Strategies Related to Ames

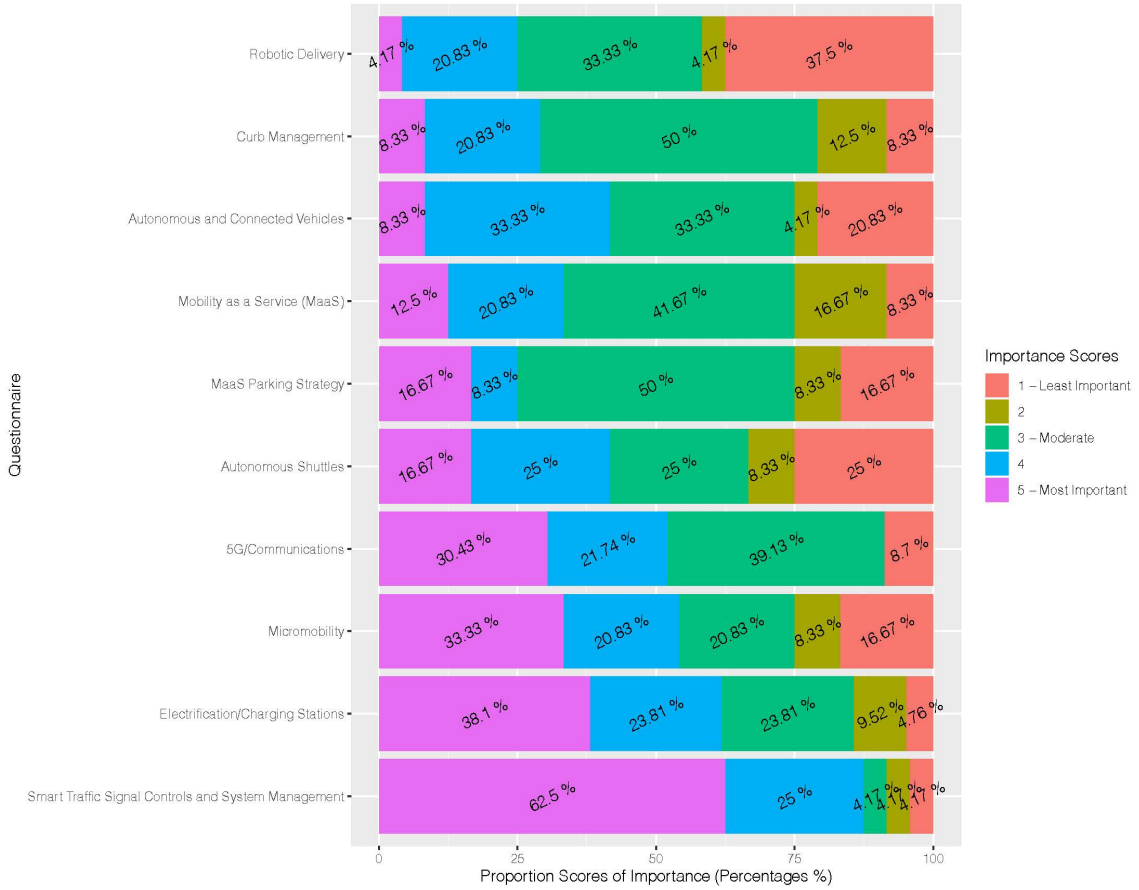
Strategy	Pros	Cons	Timeframe	Impacts
Mobility as a Service	• Decreased cost of mobility when paired with autonomous technology • Innovative approaches to personal mobility • Benefits to land use/housing/density • Better access to transit with a larger catchment area through mobility hubs and short-range mobility options	• Uncoordinated implementation • Unintended impacts to existing system (curbs, traffic flow, pedestrian access) • Induced demand if costs to consumers drop	Near to mid-term	High
MaaS Parking Strategy	• Reuse of well-located existing structures paired with autonomous vehicle technology • More efficiency (added spaces) in existing structures • Allows temporary use of surface parking to accommodate off-site storage	• Many current structures will become obsolete • Transition to MaaS will not be uniform, so triggers must be determined	Near to mid-term	High
Connected and Autonomous Vehicles	• Decreased cost of mobility • Enabling of MaaS at substantial scale • Greater development density/less parking	• Unintended vehicle uses • Induced demand/negative impacts on system • Inability to regulate/coordinate effectively	Mid to long-term	High
Autonomous Shuttles	• Lower cost/increase effectiveness of transit with better first mile/last mile connectivity • More efficient - fewer trips to serve same number of people when compared to privately owned vehicles • Introduce AV technology to broader public	• Integration with other modes on roadways • Initial tests limited to fixed routes	Near to mid-term	Moderate

Strategy	Pros	Cons	Timeframe	Impacts
Smart Traffic Signal Controls and System Management	• Increased situational awareness (vehicles and pedestrians) • Improved corridor throughput • Reduced emissions • Long-term potential to reduce or eliminate signal infrastructure if CAV adoption becomes universal	• Medium-term will likely require both traditional detection methods and emerging technologies • Uncertainty about adoption time horizons and communication protocols • Increased efficiency could be at the expense of new mobility options	Near-term	Significant
Electrification / Charging Stations	• No tailpipe emissions and lower carbon emissions than internal combustion engine • Price for consumers is rapidly declining • Overall cost of ownership for travelers is typically less than a comparable internal combustion engine vehicle	• Insufficient supporting infrastructure for power distribution and charging • Transportation system reliant upon power grid	Near-term	Moderate to high
5G / Communications	• Data-based decision-making and insights • Creation of backbone infrastructure that enables advanced safety and traffic management capabilities • Real-time system conditions and ability to react	• Data security and privacy • No access to proprietary data • No transparency in public access/ownership of data • Too much data/inability to draw conclusions	Immediate to near-term	High
Micromobility	• Expansion of mobility options • Better access to transit with a larger catchment area through mobility hubs and short-range mobility options • Availability to wide range of users	• Conflicts with other modes • Lack of “slow lane” options in ROW • Conflicts with sidewalk uses - pedestrians	Immediate to near-term	Moderate
Curb Management	• Coordination of curb access with increasing competition • Shared mobility pick-up / drop-off • Urban freight delivery designation areas/times	• Conflicts with on-street parking • Enforcement challenges • Reconfiguration of curb lane	Near to mid-term	Moderate
Robotic Delivery	• “Right-size” trip options per delivery • E-commerce efficiency • Reduce truck delivery trips	• Greatly increased number of individual deliveries • Overwhelm ROW or sidewalks	Near to mid-term	Moderate

Implementation Strategies

Public reaction to the identified technologies was gathered as part of the public open house process discussed in **Chapter 9**. **Figure 6-6** shows the results of the public questionnaire. The smart traffic signal controls and system management strategy had the highest

Figure 6-6: Results of Public Questionnaire



number of respondents that indicated this as most important, while robotic delivery received the highest amount of least important scores.

Potential implementation actions were developed and are shown in **Table 6-3**. These projects and policies are split into three timeframes: near-term (NT) or the present, mid-term (MT) or the implementation phase, and long-term (LT) or full adoption of these technologies.

Table 6-3. Potential Implementation Actions

Timeframe	Tactical Action	Description	Mobility as a Service (MaaS)	MaaS Parking Strategy	Connected and Autonomous Vehicles	Autonomous Shuttles	Smart Traffic Controls and System Management	Electrification / Charging Stations	5G / Communications	Micromobility	Curb Management	Robotic Delivery
NT	"Slow lanes" / shared lanes tactical test	• Select key corridors for slow lane test deployment • Implement test deployment • Record results to inform permanent strategy	X	X		X		X		X	X	X
NT	Smart parking	• Create app-based parking for tracking of parking availability and payment: onstreet, city-owned lots/garages, agreements with private owners • Install linked meters that communicate data to parking app, adjust fare, and accept app-based payment • Install meters / fareboxes that relay usage and capacity data to app • Create wayfinding displaying linked parking data		X	X			X	X		X	

Timeframe	Tactical Action	Description	Mobility as a Service (MaaS)	MaaS Parking Strategy	Connected and Autonomous Vehicles	Autonomous Shuttles	Smart Traffic Controls and System Management	Electrification / Charging Stations	5G / Communications	Micromobility	Curb Management	Robotic Delivery
NT	Integrate parking and transit data	• Integrate parking data with CyRide transit data, including arrival times • Integrate parking and transit payment options	X	X								
NT	Microtransit pilot	• Implement a pilot microshuttle project downtown/campus • Integrated with CyRide service		X		X	X				X	
NT	Expand electric charging capabilities	• Expand current charging facilities beyond City Hall and Bandshell Park • Identify key locations that integrate with other mobility strategies of micromobility and smart parking • Identify key regional locations in conjunction with destinations or transit links		X				X				
NT	Smart traffic signal controls	• CAV infrastructure at crash hot spots • Signal priority on congested arterials • CAV-readiness for signal upgrades			X		X		X			
NT	Standards for alternate micromobility options	• Create and implement policies for scooters, e-bikes, etc., using the models borrowed from other cities	X							X	X	

Timeframe	Tactical Action	Description	Mobility as a Service (MaaS)	MaaS Parking Strategy	Connected and Autonomous Vehicles	Autonomous Shuttles	Smart Traffic Controls and System Management	Electrification / Charging Stations	5G / Communications	Micromobility	Curb Management	Robotic Delivery
NT	Guidelines for autonomous ground-based delivery	• Prepare for alternative delivery options • Look to other communities for emerging regulations									X	X
MT	5G connected vehicle test corridor	• Select key transportation corridors to implement and test CV technology for V2X • Record results to inform permanent strategy			X		X		X			
MT	Adaptable streets strategy	• Establish standards to convert lane usage, whether for peak hours or throughout the day • Implement added adaptable lanes over time	X		X		X			X	X	
MT	Parking requirements revisions/strategy	• Determine remote parking policies and locations for self-parking vehicles • Determine CAV adoption triggers to reduce or eliminate parking requirements		X		X				X		
MT	Site development standards	• Revise site development standards to reflect reduced parking demand, preference from front-door drop off, etc.	X	X				X		X	X	X

Timeframe	Tactical Action	Description	Mobility as a Service (MaaS)	MaaS Parking Strategy	Connected and Autonomous Vehicles	Autonomous Shuttles	Smart Traffic Controls and System Management	Electrification / Charging Stations	5G / Communications	Micromobility	Curb Management	Robotic Delivery
MT	Curb management policy	• Map current freight deliveries, and TNC hotspots • Create and implement policies that manage how curb access will be provided as mobility evolves		X				X		X	X	X
MT	Land use and zoning standards update	• Parking reductions as adoption occurs • Freight-warehousing • Retail changes	X		X							
LT	Thoroughfare plan revision	• Update outcomes and capital improvement priorities based on impacts of new mobility technology	X		X		X			X	X	X
LT	Conversion of roadway network to full CAV	• Complete infrastructure technology needed for full functionality of connected and autonomous vehicles			X	X	X		X		X	
LT	Parking demand change strategy	• Develop a real estate and redevelopment strategy to capture underutilized parking areas	X	X	X	X				X		
LT	New lane use policies	• Update long-term land use for an age of autonomous driving and delivery, based on a trends analysis of behavioral shifts	X	X								X

Timeframe	Tactical Action	Description	Mobility as a Service (MaaS)	MaaS Parking Strategy	Connected and Autonomous Vehicles	Autonomous Shuttles	Smart Traffic Controls and System Management	Electrification / Charging Stations	5G / Communications	Micromobility	Curb Management	Robotic Delivery
NT	Microtransit pilot	• Implement a pilot microshuttle project downtown/campus • Integrated with CyRide service		X		X	X				X	
NT	Expand electric charging capabilities	• Expand current charging facilities beyond City Hall and Bandshell Park • Identify key locations that integrate with other mobility strategies of micromobility and smart parking • Identify key regional locations in conjunction with destinations or transit links		X				X				
NT	Smart traffic signal controls	• CAV infrastructure at crash hot spots • Signal priority on congested arterials • CAV-readiness for signal upgrades			X		X		X			
NT	Standards for alternate micromobility options	• Create and implement policies for scooters, e-bikes, etc., using the models borrowed from other cities	X							X	X	
NT	Guidelines for autonomous ground-based delivery	• Prepare for alternative delivery options • Look to other communities for emerging regulations									X	X

Timeframe	Tactical Action	Description	Mobility as a Service (MaaS)	MaaS Parking Strategy	Connected and Autonomous Vehicles	Autonomous Shuttles	Smart Traffic Controls and System Management	Electrification / Charging Stations	5G / Communications	Micromobility	Curb Management	Robotic Delivery
MT	5G connected vehicle test corridor	• Select key transportation corridors to implement and test CV technology for V2X • Record results to inform permanent strategy			X		X		X			
MT	Adaptable streets strategy	• Establish standards to convert lane usage, whether for peak hours or throughout the day • Implement added adaptable lanes over time	X		X		X			X	X	
MT	Parking requirements revisions/strategy	• Determine remote parking policies and locations for self-parking vehicles • Determine CAV adoption triggers to reduce or eliminate parking requirements		X		X				X		
MT	Site development standards	• Revise site development standards to reflect reduced parking demand, preference from front-door drop off, etc.	X	X				X		X	X	X
MT	Curb management policy	• Map current freight deliveries, and TNC hotspots • Create and implement policies that manage how curb access will be provided as mobility evolves		X				X		X	X	X

Timeframe	Tactical Action	Description	Mobility as a Service (MaaS)	MaaS Parking Strategy	Connected and Autonomous Vehicles	Autonomous Shuttles	Smart Traffic Controls and System Management	Electrification / Charging Stations	5G / Communications	Micromobility	Curb Management	Robotic Delivery
MT	Land use and zoning standards update	• Parking reductions as adoption occurs • Freight-warehousing • Retail changes	X		X							
LT	Conversion of roadway network to full CAV	• Complete infrastructure technology needed for full functionality of connected and autonomous vehicles			X	X	X		X		X	
LT	Parking demand change strategy	• Develop a real estate and redevelopment strategy to capture underutilized parking areas	X	X	X	X				X		
LT	Thoroughfare plan revision	• Update outcomes and capital improvement priorities based on impacts of new mobility technology	X		X		X			X	X	X
LT	New lane use policies	• Update long-term land use for an age of autonomous driving and delivery, based on a trends analysis of behavioral shifts	X	X								X

Chapter 7
Fiscally Constrained Plan

Chapter 7 **Fiscally Constrained Plan**

Fiscal constraint is a Federal requirement for MTPs and means the MPO has identified a list of future transportation projects whose costs are within the anticipated revenues forecasted for the region. Through the development of a fiscally constrained plan, the MPO is able to demonstrate that identified projects considered for future implementation are financially feasible.

Selection of Projects for the Fiscally Constrained Plan

Candidate projects were selected for inclusion in the fiscally constrained plan based on how they scored against the project scoring criteria shown in **Chapter 6**, and the forecasted year-of-expenditure costs associated with their planning, design, and construction in relation to the available Federal and local revenue levels that were projected.

2020-2045 Fiscally Constrained Plan

The fiscally constrained plan is presented in the time bands described in **Chapter 5** and includes the estimated costs in 2020 dollars, Year-of-Expenditure (YOE) dollars, potential funding source, and potential funding sponsor in addition to a brief description of each project.

2020-2024 Transportation Improvement Program

The current Transportation Improvement Program covers the years 2021 through 2024 and the projects presented in the current TIP document reflect those that are considered to be committed for purposes of developing the fiscally constrained plan. Fiscally constrained projects that are to be considered for implementation beyond the current TIP will start in the year 2025, or the Short-Term time band.

The committed roadway projects identified in the 2021-2024 TIP are in **Table 7-1** while the committed bicycle and pedestrian projects are shown in **Table 7-2**.

Table 7-3 shows the committed transit projects identified by CyRide for the fixed-route and paratransit systems.

Table 7-1: List of Committed Roadway Projects from the AAMPO 2021-2024 TIP

ID	Project Description	Type
C1	Cherry Ave from Lincoln Way to SE 5th Street - Add New Road	New Road
C2	Grand Ave from S 3rd St to S 16th St - Add New Road	New Road
C3	Duff Ave & S 16th Street - Add Turn Lanes	Turn Lanes
C4	Hoover Ave & 30th St to Duff Ave & 13th St - Road Diet to 3 Lanes	Road Diet
C5	Duff Ave from 13rd St to Crystal St - Add Adaptive Signal Control Technologies	Signal Upgrades
C6	Lincoln Way from Beach Ave to Hyland Ave - Add Adaptive Signal Control Technologies	Signal Upgrades
C7	Lincoln Way from Grand Ave to Duff Ave - Add Adaptive Signal Control Technologies	Signal Upgrades
C8	University Blvd from Lincoln Way to US30 - Add Adaptive Signal Control Technologies	Signal Upgrades
C9	State Ave & Mortensen Rd - Traffic Signal & Turn Lanes	Traffic Signal/Turn Lanes
C10	SE 16th St & Dayton Ave - Traffic Signal	Traffic Signal
C11	Duff Ave & US30 EB Ramp - Traffic Signal	Traffic Signal
C12	Hyde Ave & Bloomington Rd - Traffic Signal	Traffic Signal
C13	16th St from University Blvd to Apple Place – Widen to 4 Lanes	Widening

Table 7-2: List of Committed Bicycle and Pedestrian Projects from the AAMPO 2021-2024 TIP

ID	Description	Type
C 1	Intersection of Dayton / S 16th - Improve visibility for crossing	Crossing
C 2	Intersection of Duff / S 16th St - Improve crossing visibility, median refuge. Part of project 44A.	Crossing
C 3	Intersection of Grand / 6th St - Improve crossing visibility of Grand	Crossing
C 4	S 16th midblock trail crossing near Vet Med - High visibility treatment for trail cross - over	Crossing
C 5	Intersection of Grand / (N) 16th St - Cycling Enhancements to support 16th Street Bike Route	Crossing
C 6	Intersection of Duff / S 5th - Improve crossing visibility of Duff and 5th. Part of project 44A.	Crossing
C 7	N Walnut Sharrows	Bike Route
C 8	North Duff Bike Lanes	Bike Lane
C 9	30th St Bike Lanes	Bike Lane
C 10	6th Street Bike Lanes	Bike Lane
C 11	Hoover Ave bike lanes from 30th to Bloomington Rd	Bike lanes
C 12	Grand Ave Side Path between Lincoln Way and 6th Street	Shared-use path
C 13	Skunk River - South Duff Trail Connection along Billy Sunday Rd.	Shared-use path
C 14	Gilbert to Ames trail - Hyde Ave south of W 190th St	Shared-use path
C 15	Stange Road to Bloomington Trl	Shared-use path
C 16	Squaw Creek Trail	Shared-use path
C 17	S Dakota Side Path	Shared-use path
C 18	S 5th sidepath from Walnut to Duff Ave	Shared-use path
C 19	Lincoln Way Bike Lanes, Duff Ave to Dayton. With roadway projects 19 and 20.	Bike lanes
C 20	Complete bike trail/shared path connection between SE 16th and Lincoln Way	Shared-use path
C 21	Pave existing gravel trail between South 4th St to SUP 15	Shared-use path
C 22	Grand Avenue extension sidepath	Shared-use path
C 23	Oakwood Rd from State Ave to Cedar Ln sidepath	Shared-use path
C 24	E 13th from Meadowlane Ave to Duff Ave sidepath	Shared-use path
C 25	Mortensen Rd from Wilder Blvd to 0.4 miles west	Shared-use path
C 26	Lincoln Way from Hartford Dr to Lincoln Way frontage road	Shared-use path
C 27	Grand Ave from Bloomington Rd to Dawes Rd sidepath	Shared-use path
C 28	Southwest Greenbelt Trail	Shared-use path

Table 7-3: Committed Transit Projects for CyRide's Fixed-Route and Paratransit Systems

ID	Description	Type
1	Vehicle Replacement/Expansion - 3 buses per year	Equipment
2	Building Improvements and Expansion	Capital
3	Real-Time Passenger Information	Technology
4	Passenger Amenity Improvements	Operations
5	Battery Electric Buses	Vehicles
6	Battery Electric Bus Charging Infrastructure	Capital
7	Battery Electric Bus Facility Modifications	Capital
8	Light Duty Vehicles	Vehicles
9	Articulated Bus Expansion/Replacement	Vehicles
10	Install Benches & Shelters	Operations

Fiscally Constrained Projects

The fiscally constrained projects are presented by time band (Short-, Mid-, and Long-Term), but the projects selected for implementation beyond the Short-Term may be implemented sooner. A list of illustrative projects, which are projects that are priorities for the MPO but are unable to be selected for the fiscally constrained plan due to their cost, is also included in this section. Projects identified as illustrative could be implemented within the planning horizon of 2045 should additional funding resources be identified.

Short-Term Projects

Projects to be implemented in the Short-Term are considered to have an implementation timeframe of 2025 through 2029 and were identified as being critical to addressing the current needs of the system. Total costs (in YOE dollars) by mode for the Short-Term period are:

- **Roadway**: $14,930,000 in roadway expansion and improvements
- **Bicycle and Pedestrian**: $5,780,000 in bicycle and pedestrian expansion and improvements
- **Transit**: $18,870,000 on transit vehicles and capital improvements

Mid-Term Projects

Projects to be implemented in the Mid-Term are considered to have an implementation timeframe of 2030 through 2037 and were identified as being a high priority in furthering the operational efficiency and safety of the system. Total costs (in YOE dollars) by mode for the Mid-Term period are:

- **Roadway**: $31,430,000 in roadway expansion and improvements
- **Bicycle and Pedestrian**: $10,660,310 in bicycle and pedestrian expansion and improvements
- **Transit**: $36,630,000 on transit vehicles and capital improvements

Long-Term Projects

Projects to be implemented in the Long-Term are considered to have an implementation timeframe of 2038 through 2045, and address the remaining high and medium priority needs that remain for the system. Total cost (in YOE dollars) by mode for the Long-Term period are:

- **Roadway**: $33,710,000 in roadway expansion and improvements
- **Bicycle and Pedestrian**: $11,820,000 in bicycle and pedestrian expansion and improvements

- **Transit**: $46,400,000 on transit vehicles and capital improvements

Table 7-4 through **Table 7-6** show the fiscally constrained projects by mode while **Figure 7-1** and **Figure 7-2** present the fiscally constrained projects for the roadway and bicycle and pedestrian systems by time band.

Table 7-4: Fiscally Constrained Roadway Projects

Time Frame	Project ID	Project Description	Cost (2020 $)	Cost (YOE $)	Potential Federal Share	Potential Local Share	Potential Non-Local Funding Sources	Potential Sponsor(s)
Short-Term (2025-2029)	40	16th Street, Grand Avenue, and Dayton Avenue Traffic Signal Network (Phase 6)	$1,130,000	$1,440,000	$724,752	$715,248	ICAAP	City of Ames
	37	Airport Rd from Duff Ave to Sam's Club - Improve Roadway Access	$800,000	$1,020,000	$513,366	$506,634	STBG Swap	City of Ames
	16	13th St & Grand Ave - Left Turn Lanes (All Approaches)	$3,000,000	$3,820,000	$1,922,606	$1,897,394	STBG Swap	City of Ames
	2 OR 2A	Hyde Ave/Grant Ave & W 190th St	$2,000,000	$2,540,000	$1,278,382	$1,261,618	STBG Swap	Story County / City of Ames
	28	13th Street & Dayton Ave - Add turn lane(s)	$2,000,000	$2,540,000	$1,278,382	$1,261,618	STBG Swap	City of Ames
	24	Cherry – Lincoln Way Intersection Improvements	$1,200,000	$1,530,000	$770,049	$759,951	STBG Swap	City of Ames
	38	Grand Ave & 20th St - Left Turn Lanes	$1,600,000	$2,040,000	$1,026,732	$1,013,268	STBG Swap	City of Ames
		Time Frame Total	**$11,730,000**	**$14,930,000**	**$7,514,269**	**$7,415,731**		
Mid-Term (2030-2037)	30	Duff Ave from S 16th Street to Airport Rd - Widen to 6 Lanes/Reconstruct Interchange	$10,000,000	$15,910,000	$8,007,503	$7,902,497	STBG / NHPP / ICAAP	City of Ames / Iowa DOT
	19	Lincoln Way from Gilchrist St to Duff Ave - Road Diet from 4 Lanes to 3 Lanes	$1,750,000	$2,780,000	$1,399,174	$1,380,826	STBG Swap	City of Ames
	32a	Duff Ave from Airport Rd to Ken Maril - Widen to 5 Lanes	$8,010,000	$12,740,000	$6,412,042	$6,327,958	ICAAP	City of Ames
		Time Frame Total	**$19,760,000**	**$31,430,000**	**$15,818,719**	**$15,611,281**		
Long-Term (2038-2045)	44a	Grand Ave from Bloomington Rd to 190th St - Widen to 5 Lanes	$10,400,000	$21,790,000	$10,966,907	$10,823,093	ICAAP / NHPP	City of Ames / Iowa DOT
	22	Dayton Ave from 13th St to Lincoln Way - Widen to 5 Lanes	$3,200,000	$6,700,000	$3,372,110	$3,327,890	STBG Swap	Story County / City of Ames
	14	13th St & Stange Road - N/S Left Turn Lanes	$2,490,000	$5,220,000	$2,627,226	$2,592,774	Local	City of Ames
		Time Frame Total	**$16,090,000**	**$33,710,000**	**$16,966,243**	**$16,743,757**		
		Grand Total	**$47,580,000**	**$80,070,000**	**$40,299,231**	**$39,770,769**		

Figure 7-1: Fiscally Constrained Roadway Projects by Implementation Timeframe

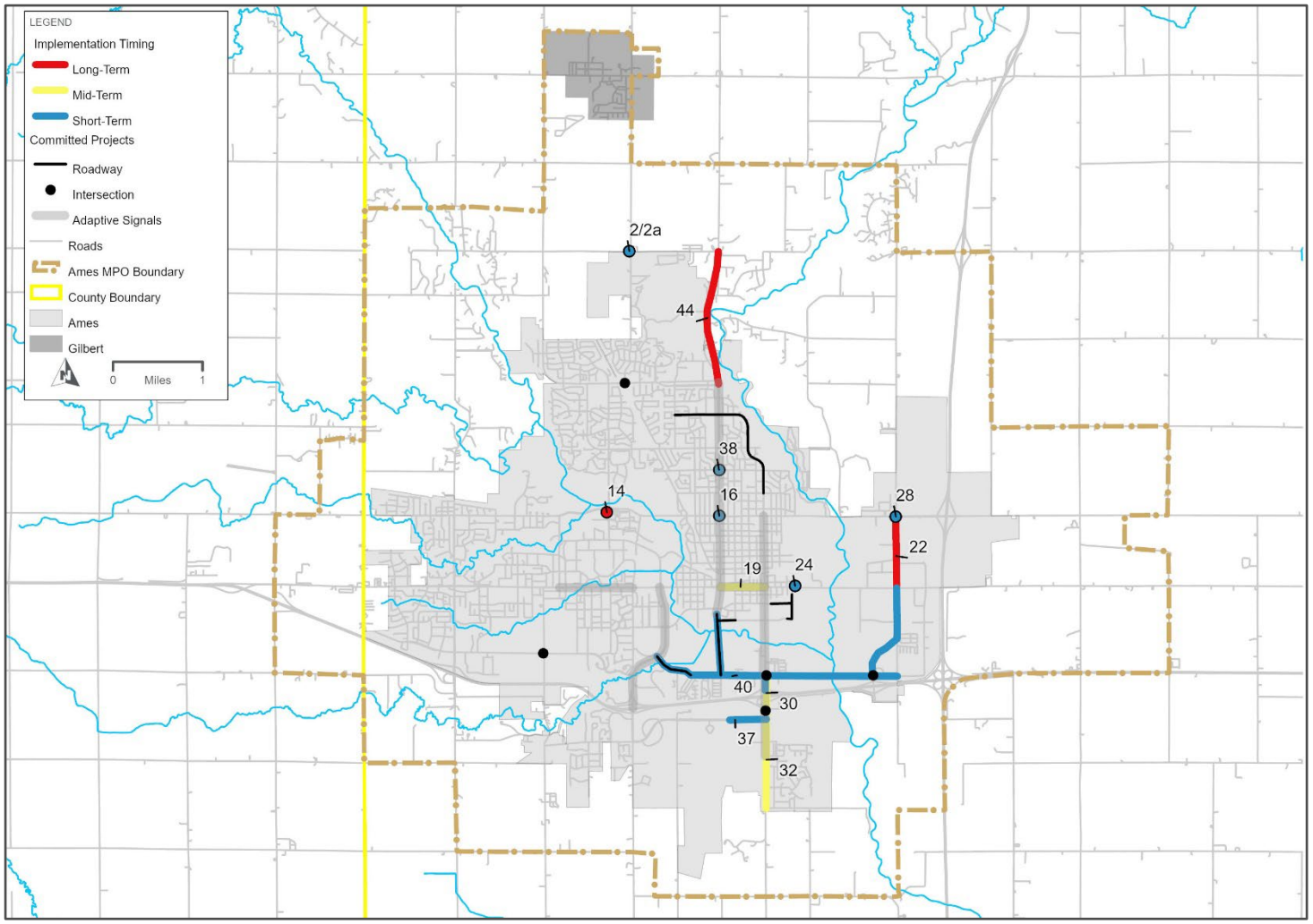


Table 7-5: Fiscally Constrained Bicycle and Pedestrian Projects

Time Frame	Project ID	Project Description	Cost (2020 $)	Cost (YOE $)	Potential Federal Share	Potential Local Share	Potential Funding Sources	Potential Sponsor(s)
Short-Term (2025-2029)	CR 42	Intersection of Lincoln Way / University - Protected intersection. Roadway project 25	$750,000	$950,000	$0	$950,000	TAP / Local	City of Ames
	OFF 1	East 13th sidepath, Northwestern Ave to Duff Ave	$560,000	$710,000	$87,330	$622,670	TAP / Local	City of Ames
	OFF 2	West Mortensen Side Path, fill in gap west of South Dakota	$410,000	$520,000	$63,960	$456,040	TAP / Local	City of Ames
	OFF 3	24th St Sidepath Grand to Duff	$250,000	$320,000	$39,360	$280,640	TAP / Local	City of Ames
	OFF 20	Grand Ave Side Path between 6th and 16th Street	$650,000	$830,000	$102,090	$727,910	TAP / Local	City of Ames
	OFF 29	Cherry Street Connection to Squaw Creek	$490,000	$620,000	$76,260	$543,740	TAP / Local	City of Ames
	OFF 48	East 6th St to Skunk River Connection	$550,000	$700,000	$86,100	$613,900	TAP / Local	City of Ames
	OFF 50	South Duff Sidepath	$290,000	$370,000	$45,510	$324,490	TAP / Local	City of Ames
	ON 15	Clark / Walnut Bike Route, South 3rd to S 5th Street	$90,000	$110,000	$13,530	$96,470	TAP / Local	City of Ames
	ON 47	Carroll Ave Bike Route	$150,000	$190,000	$116,466	$73,534	TAP / Local	City of Ames
	Time Frame Total		**$4,190,000**	**$5,320,000**	**$630,606**	**$4,689,394**		
Mid-Term (2030-2037)	OFF 53	Skunk River trail connection	$2,990,000	$4,760,000	$585,480	$4,174,520	TAP / Local	City of Ames
	OFF 33	Squaw Creek Trail from Grand Avenue Extension to 4th Street	$2,200,000	$3,500,000	$430,500	$3,069,500	TAP / Local	City of Ames
	ON 30	Ash Ave Bike Route, current bike lane end to Lincoln Way	$80,000	$130,000	$15,990	$114,010	TAP / Local	City of Ames
	CR	Various Pedestrian Crossing Projects	$1,700,000	$2,700,000	$0	$2,700,000	TAP / Local	City of Ames
	Time Frame Total		**$6,970,000**	**$11,090,000**	**$1,031,970**	**$10,058,030**		

Time Frame	Project ID	Project Description	Cost (2020 $)	Cost (YOE $)	Potential Federal Share	Potential Local Share	Potential Funding Sources	Potential Sponsor(s)
Long-Term (2038-2045)	OFF 31	Hyland-Hayward South Campus Trail Connection	$1,850,000	$3,880,000	$477,240	$3,402,760	TAP / Local	City of Ames
	OFF 55	Stange Rd Pedestrian Crossing	$110,000	$230,000	$28,290	$201,710	TAP / Local	City of Ames
	ON 14	20th St Bike Route, Ames High to Grand	$150,000	$310,000	$38,130	$271,870	TAP / Local	City of Ames
	ON 16	Welch On-Street Bike Treatment, Mortensen to Union Drive	$90,000	$190,000	$23,370	$166,630	TAP / Local	City of Ames
	ON 21	Bike Route north of Lincoln Way between North Dakota and Iowa State Campus	$350,000	$730,000	$89,790	$640,210	TAP / Local	City of Ames
	ON 26	20th Street Bike Route, Grand to Duff	$70,000	$150,000	$18,450	$131,550	TAP / Local	City of Ames
	ON 33	Cessna St Bike Route	$110,000	$230,000	$28,290	$201,710	TAP / Local	City of Ames
	ON 41	Welch Ave Pedestrian Mall (Lincoln to Hunt)	$130,000	$270,000	$33,210	$236,790	TAP / Local	City of Ames
	ON 44	Eisenhower Ave/Hayes Ave/Ridgewood Ave from Harrison Rd to 6th St - Bike Route	$380,000	$800,000	$98,400	$701,600	TAP / Local	City of Ames
	CR	Various Pedestrian Crossing Projects	$2,400,000	$5,030,000	$0	$5,030,000	TAP / Local	City of Ames
Time Frame Total			**$5,640,000**	**$11,820,000**	**$835,170**	**$10,984,830**		
Grand Total			**$16,800,000**	**$28,230,000**	**$2,497,746**	**$25,732,254**		

Figure 7-2: Fiscally Constrained Bicycle and Pedestrian Projects

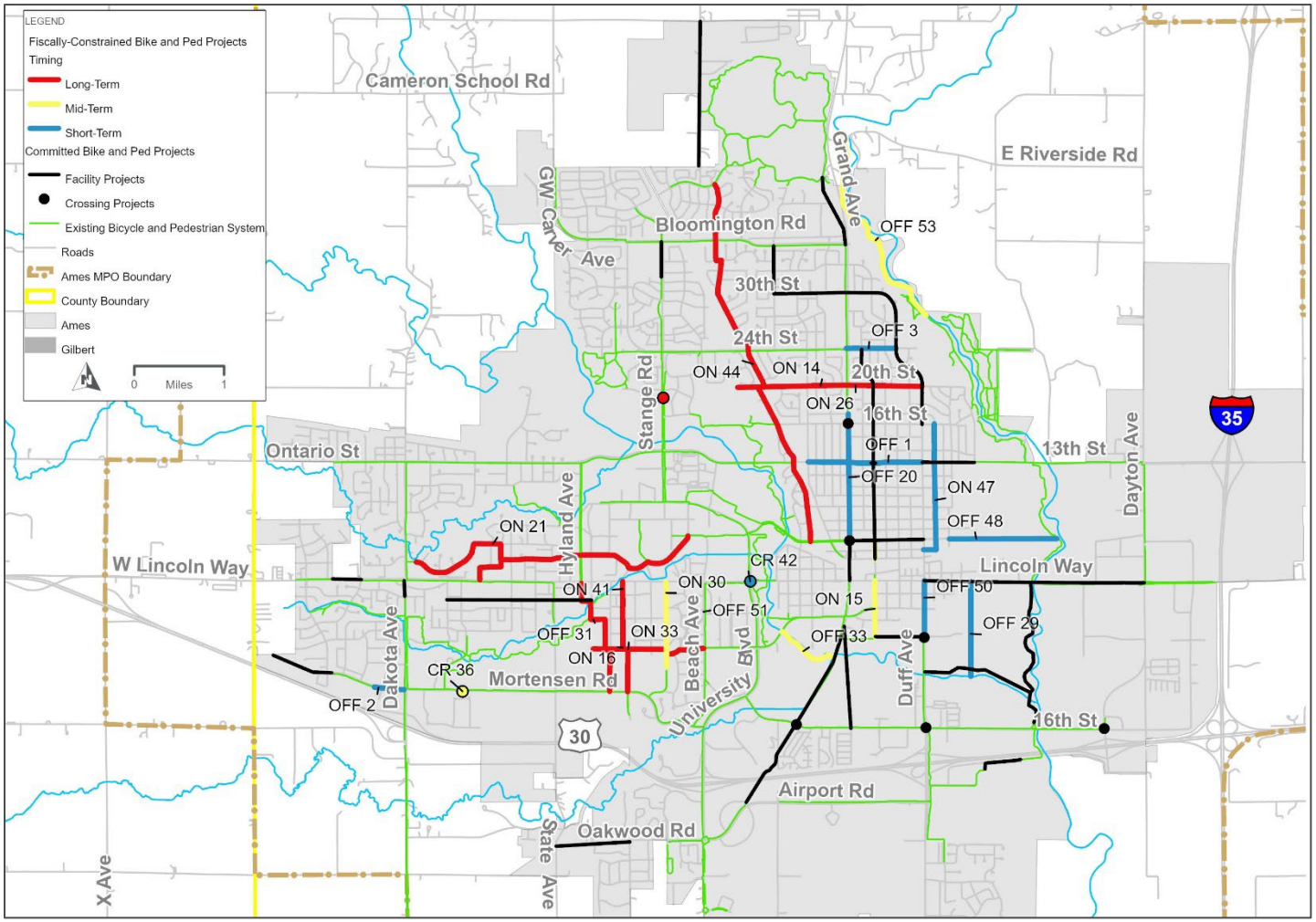


Table 7-6: Fiscally Constrained Transit Projects

Time Frame	Project ID	Project Description	Cost (YOE $)
Short-Term (2025-2029)	1	Vehicle Replacement/Expansion - 3 buses per year	$9,200,000
	2	Building Improvements and Expansion	$3,880,000
	8	Light Duty Vehicles	$660,000
	9	Articulated Bus Expansion/Replacement	$4,930,000
	10	Install Benches & Shelters	$200,000
		Total	**$18,870,000**
Mid-Term (2030-2037)	1	Vehicle Replacement/Expansion - 3 buses per year	$17,860,000
	2	Building Improvements and Expansion	$7,540,000
	8	Light Duty Vehicles	$1,280,000
	9	Articulated Bus Expansion/Replacement	$9,570,000
	10	Install Benches & Shelters	$380,000
		Total	**$36,630,000**
Long-Term (2038-2045)	1	Vehicle Replacement/Expansion - 3 buses per year	$22,620,000
	2	Building Improvements and Expansion	$9,550,000
	8	Light Duty Vehicles	$1,620,000
	9	Articulated Bus Expansion/Replacement	$12,130,000
	10	Install Benches & Shelters	$480,000
		Total	**$46,400,000**
		Grand Total	**$101,900,000**

Project costs shown in the tables above include all funding sources, including Federal formula-based, Federal discretionary, and local funds. **Table 7-7** and **Table 7-8** below provides a summary of MPO revenue levels and project costs to demonstrate fiscal constraint.

Table 7-7: Summary of Revenue Levels and Project Costs for the Fiscally Constrained Roadway Plan

Time Periods	Funding Type	Carry Over From Previous Period	Revenue (YOE $)	Project Costs (YOE $)
Short-Term (2026-2029)	Federal Sources	$1,903,943	$8,215,000	
	Local Sources	$0	$8,503,380	
	Total	$1,903,943	$16,718,380	$14,930,000
Mid-Term (2030-2037)	Federal Sources		$14,485,000	
	Local Sources		$14,993,820	
	Total	$3,692,323	$29,478,820	$31,430,000
Long-Term (2038-2045)	Federal Sources		$16,317,000	
	Local Sources		$16,889,940	
	Total	$1,741,143	$33,206,940	$33,710,000
Ending Balance		**$1,238,083**		

Table 7-8: Summary of Revenue Levels and Project Costs for the Fiscally Constrained Bicycle and Pedestrian Plan

Time Periods	Funding Type	Carry Over From Previous Period	Revenue (YOE $)	Project Costs (YOE $)
Short-Term (2026-2029)	TAP	$245,758	$534,000	
	Local	$0	$5,511,590	
	Total	$245,758	$6,045,590	$5,780,000
Mid-Term (2030-2037)	TAP		$942,000	
	Local		$9,718,310	
	Total	$511,348	$10,660,310	$11,090,000
Long-Term (2038-2045)	TAP		$1,062,000	
	Local		$10,947,370	
	Total	$81,658	$12,009,370	$11,820,000
Ending Balance		**$271,028**		

Bicycle and Pedestrian Projects Tied to Roadway Projects

Several bicycle and pedestrian projects were identified as priorities that could be implemented in coordination with roadway improvement projects. These bicycle and pedestrian projects that are anticipated to be implemented at the time of roadway project construction are shown in **Table 7-9**.

Table 7-9: Coordinated Roadway and Bicycle and Pedestrian Projects

Bicycle / Pedestrian Project ID	Bicycle / Pedestrian Project Description	Coordinated Roadway Project
CR 8	Intersection of Stange / 13th St - Improvements for trail crossing visibility	Tied to Roadway Project 14
CR 14	Intersection of 20th / Grand - Crossing / Signal improvements	Tied to Roadway Project 38
CR 41	Intersection of Grand Ave / 13th St - Improvements for crossing visibility and safety (on bikeway)	Tied to Roadway Project 16
OFF 10	East 13th Street separated bikeway - Ridgewood Ave to Grand Ave.	Tied to Roadway Project 16

Illustrative Projects

Due to limitations on Federal and local funding levels, not all projects that meet the needs of the MPO region can be included in the fiscally constrained plan. These projects, termed illustrative projects, are retained in the event that additional funding becomes available in the future. The roadway projects identified as illustrative are listed in **Table 7-10**. They are also shown in **Figure 7-3**. The transit projects identified as illustrative are listed in **Table 7-11.**

Developer-Driven Projects

Several of the candidate roadway and bicycle and pedestrian projects are expected to be "developer-driven," meaning that their funding and implementation is the responsibility of the developer and will not be considered in the fiscally constrained plan or illustrative list because AAMPO will not need to source Federal or local funds for their implementation. Developer-driven projects are listed in **Table 7-12** and shown in **Figure 7-3**.

Potential Iowa DOT Projects

The Iowa DOT has identified several projects for implementation on the NHS in the AAMPO region, but these projects currently do not have a funding source identified. These projects consist of roadway widenings and interchange reconstruction. Potential Iowa DOT projects are listed in **Table 7-11** and shown in **Figure 7-3**.

Table 7-10: Illustrative Roadway Projects

MTP ID	Project Description	Project Cost
1	520th Ave & W 190th St - Roundabout	$1,500,000
4	E Riverside Rd to from Grand Ave to N Dayton Ave - Widen to 3 Lanes	$12,920,000
5	E Riverside Rd from N Dayton Ave to 570th Ave - Add New 3-Lane Road & I-35 Overpass	$7,950,000
6	E Riverside Rd & I-35 - New Interchange (remove 190th St/I-35 Interchange)	$15,000,000
9	Bloomington Rd from Hyde Ave to Hoover Ave - Widen to 4 Lanes	$3,210,000
10	580th St and UPPR Grade Separation	$2,830,000
11	Duff Ave & 16th/20th/24th St Roundabout/Traffic Circle	$1,500,000
13	N Dakota from Ontario St to UPRR - Widen to 3 Lanes	$840,000
17	13th St from Dayton Ave to 570th Ave - Widen to 6 Lanes/Reconstruct Interchange to 4 lane Diverging Diamond Interchange	$11,880,000
21	Duff Ave and UPPR grade separation	$22,000,000
29	Grand Ave from S 16th Street to Airport Rd - New Road w/ Traffic Signal @ Airport Road	$13,500,000
33	265th St from Duff Ave to Skunk River - Pave to 3 Lanes	$5,500,000
34	265th St from Skunk River to I-35 - Pave to 2 Lanes	$2,800,000
35	265th St & I-35 - New Interchange	$15,000,000
36	265th from University Ave to Duff Ave & University Ave from 265th to Collaboration Pl - Pave to 3 Lanes (coordinate with Airport Master Plan)	$9,660,000
45	190th St from 520th Ave to Grand Ave - Widen to 3 Lanes / Grade Separation w UPRR	$11,310,000
53	South Dakota Avenue from Lincoln Way to Mortensen Road - Widen to 5 lanes	$6,000,000
1a	520th Ave & W 190th St - Traffic Signal & Turn Lanes	$1,400,000

Table 7-11: Illustrative Transit Projects

MTP ID	Project Description	Project Type	Notes
1	Lincoln & Beach - Add Transit Signal Priority	Transit Signal Priority	Projects 1 and 2 tied to committed project C6 - Lincoln Way from Beach Ave to Hyland Ave traffic signal project. Funding would be coordinated with City of Ames Public Works.
2	Lincoln & Welch - Add Transit Signal Priority	Transit Signal Priority	
3	Stange & Bruner - Add New Signal	New Signal	Project funding would be coordinated with City of Ames Public Works
4	Stange & Blankenburg - Add Pedestrian Crossing	Pedestrian Crossing	Project funding would be coordinated with City of Ames Public Works
5	South Dakota & Steinbeck - Add Pedestrian Crossing	Pedestrian Crossing	Project funding would be coordinated with City of Ames Public Works
6	Ames Intermodal Facility Improvements	Facilities	Facility is new in 2012, but some improvements like lot resurfacing are anticipated by 2045. Costs will be divided between the City and Iowa State University.
7	Iowa State Center (ISC) - Implement Transit-Oriented Development in Conjunction with Redevelopment	Transit Oriented Development	Project funding would be coordinated with ISU. CyRide participation not certain, and impacts to service will vary according to redevelopment project plans.
8	South 16th Street - Add Innovative Transit Service Zone	Service	Additional vehicle in East Ames on weekdays 7am-7pm (year-round)
9	North Ames (Somerset/Northridge/Valley View) - Add Innovative Transit Service Zone	Service	Weekdays 7am-7pm (year-round)
10	Applied Sciences - Add Innovative Transit Service Zone	Service	Weekdays 7am-7pm (school year only)
11	Stange Road from Bloomington to University - Corridor Service Improvements	Service	Daily 20-minute service (school year only)
12	University Blvd from ISU/ISC to ISU Research Park - Corridor Service Improvements	Service	Daily 20-minute service (school year only)
13	South Duff from Lincoln to Crystal - Corridor Service Improvements	Service	Daily 20/30-minute service (year-round with reduced summer/break schedule)

MTP ID	Project Description	Project Type	Notes
14	Airport Road from South Duff to University - Corridor Service Improvements	Service	Weekdays 7am-7pm (year-round)
15	Ames to Ankeny and Des Moines Intercity/Commuter Service	Service	Would likely not be funded by CyRide
16	Amtrak Thruway from Ames to Osceola Intercity/Commuter Service	Service	Two trips per day; would likely not be funded by CyRide
17	ISU to College of Veterinary Medicine - Corridor Service Improvements	Service	Weekdays 7am-7pm (school year only)
18	Additional Vehicle Replacement/Expansion	Rolling Stock	Vehicle replacement beyond levels in constrained plan.
19	Additional Battery Electric Buses	Rolling Stock	
20	Additional Battery Electric Bus Charging Infrastructure	Facilities	
21	Facility Expansion/Modifications	Facilities	
22	Automatic Passenger Counters (APCs) for Full Fleet to Collect Stop-Level Ridership Data	Technology	Eleven vehicles have APCs now; install APCs on 69 remaining vehicles in peak fleet (total of 80 large vehicles)
23	Automatic Vehicle Location (AVL) Technology Upgrades - Future Technology	Technology	
24	Real-Time Passenger Information System - Information to Customers on Vehicle Location and Passenger Loads	Technology	
25	On-Demand Trip Booking App for East Ames Service Extension (EASE) and Moonlight Express	Technology	
26	Electronic Farebox System	Fares	RFID/QR reader to validate passes; assumed installation on 80 vehicles
27	Provide Free Fares for Youth (18 and Under)	Fares	
28	Regional Commuter Study (North Ames, Nevada, Gilbert, Boone, etc.)	Planning	Planning funds would be requested from Ames MPO
29	Late-Night Service Effectiveness Study	Planning	Planning funds would be requested from Ames MPO

MTP ID	Project Description	Project Type	Notes
30	Install Benches & Shelters	Passenger Amenities	Benches and shelters beyond levels in constrained plan.
31	Add Passenger Information at Bus Stops	Passenger Amenities	
32	Add LED Signage and Real-Time Passenger Information at Major Bus Stops	Passenger Amenities	Would be installed in high-demand and transfer stops
33	Transit and Bicycle Integration - Roadway Improvement Projects	Multimodal Integration	Transit islands and other infrastructure improvements when road diets are implemented. Project funding coordinated with City of Ames.

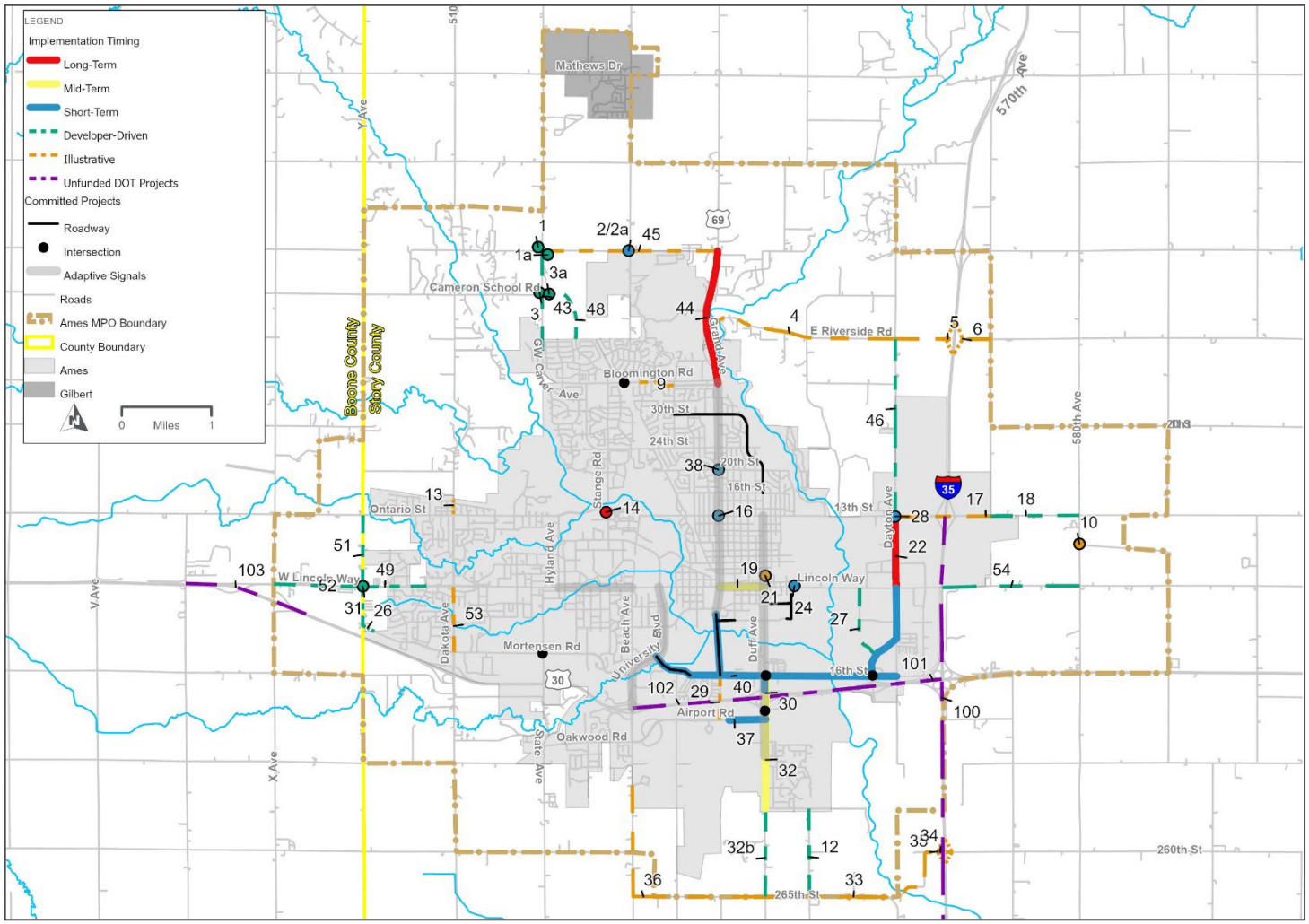
Table 7-12: Developer-Driven and Unfunded Iowa DOT Projects

Developer-Driven		
MTP ID	**Project Description**	**Cost**
12	550th Ave from 265th to Ken Maril Rd - Pave 2 Lanes	$5,600,000
18	13th St from 570th Ave to 580th Ave - Widen to 4 Lanes	$8,040,000
26	Y St from Lincoln Way to Mortensen Rd including Mortensen Rd Extension to Y St - Pave 3 Lanes	$3,200,000
27	Freel Dr from Lincoln Way to Dayton Ave - Add New Road	$4,500,000
32	Duff Ave from Airport Rd to 265th St - Widen to 5 Lanes	$16,020,000
43	George Washington Carver from Weston Dr to 190th St - Widen to 3 Lanes	$5,650,000
46	Dayton Ave from 13th St to Riverside Rd - Widen to 3 Lanes	$9,870,000
48	Stange Rd Extension North to Cameron School Rd - Pave 3 Lanes	$2,700,000
49	Lincoln Way from Thackery Rd to Y Ave - Widen to 4 Lanes	$5,800,000
51	Y Ave from Lincoln Way to Ontario St - Widen to 3 Lanes	$4,070,000
52	Lincoln Way from Y Ave to X Ave - Widen to 4 Lane	$8,070,000

54	Lincoln Way from I-35 to 580th Ave - Widen to 3 Lanes	$8,200,000

Unfunded Iowa DOT Projects	
MTP ID	**Project Description**
100	I-35 Widening-From 13th St south to MPO Boundary
101	US 30 Widening-From I-35 to Duff Ave
102	US 30 Widening-From Duff Ave to University Ave (coordinate with Illustrative Project #29)
103	US 30-X Ave / W Ave interchange reconstruction and reconfiguration

Figure 7-3: Fiscally Constrained and Alternative Roadway Projects



Future Planned System Performance

An additional scenario that incorporates the roadway projects identified in the fiscally constrained plan was analyzed to evaluate system performance under the Existing plus Committed and Planned network (E+C+P). The same regional growth levels presented in **Chapter 4** are retained for this scenario, with the only change being the addition of the planned (fiscally constrained) roadway projects. The same post-processing procedure outlined in **Chapter 4** was applied to the 2045 E+C+P scenario traffic volumes, which are shown in **Figure 7-4**.

A comparison of system-wide statistics for the Existing, 2045 E+C, and 2045 E+C+P scenario are shown in **Table 7-** below:

Table 7-13: Comparison of System-Wide Performance Statistics for Existing, E+C, and E+C+P Scenarios

Performance Measure (Annual)	2015	2045 E+C	2045 E+C+P	2015-2045 E+C change	2015-2045 E+C+P change
Vehicle Miles Traveled (VMT)	468,226,535	714,556,026	713,740,563	52.6%	52.4%
Vehicle Hours Traveled (VHT)	11,836,478	20,602,681	19,921,382	74.1%	68.3%
Trips	154,187,813	202,555,211	202,555,211	31.4%	31.4%
Average Trip Length (miles)	3.04	3.53	3.52	16.2%	16.0%
Average Trip Speed (mph)	39.6	34.7	35.8	-12.5%	-9.4%

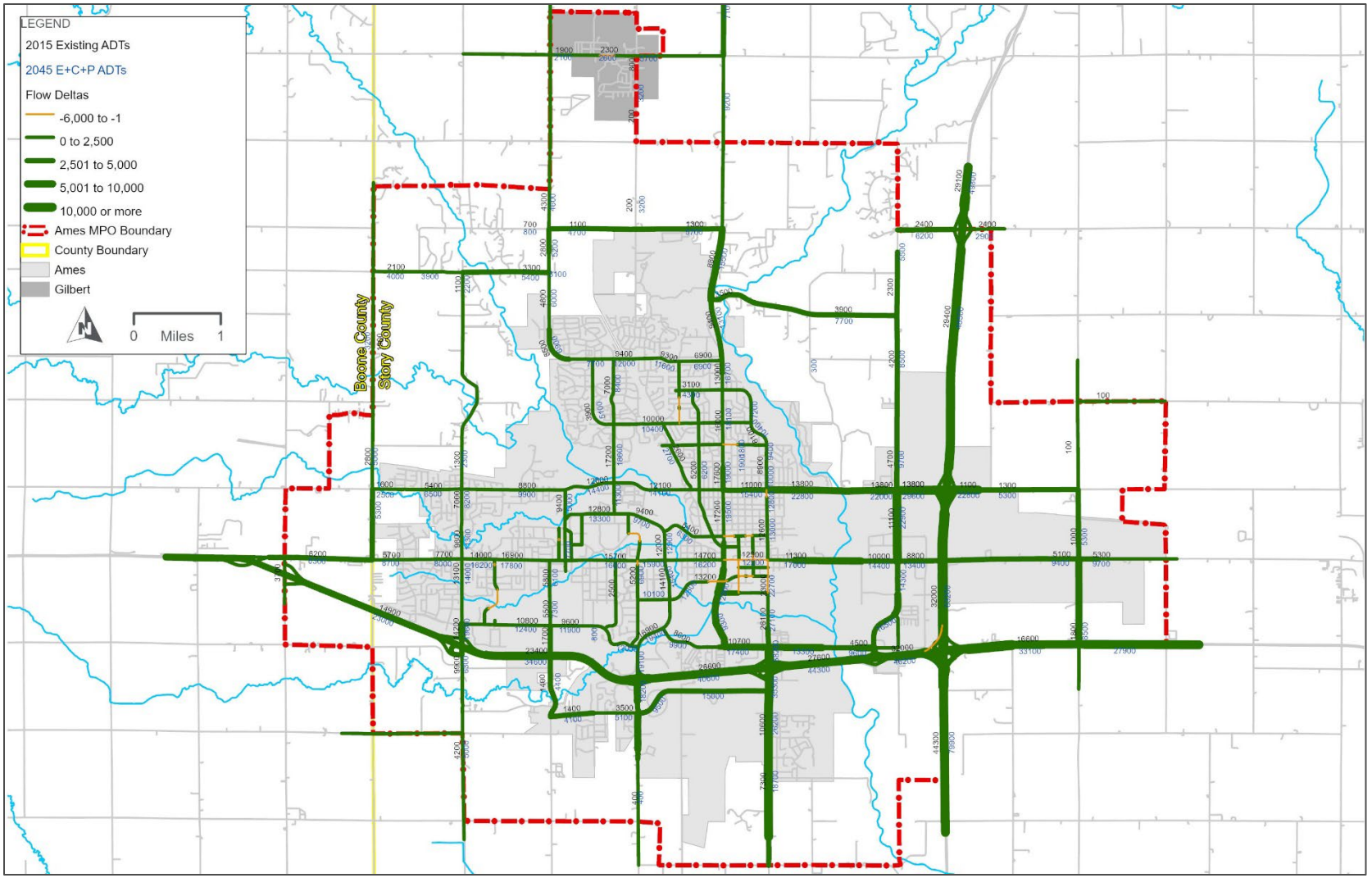
Source: Ames Area MPO Travel Demand Model

As shown in **Table 7-13**, when comparing the E+C+P network to the 2015 base year:

- Vehicle Miles Traveled (VMT) is predicted to increase by 52% during the 30-year period, which indicates that the average trip will be longer, in terms of distance, than trips taken today.
    - Compared to the E+C scenario, the E+C+P scenario is expected to have 0.1% less VMT.
- Vehicle Hours Traveled (VHT) is predicted to increase by nearly 68%, which indicates that the average trip will be longer, in terms of time spent traveling, than trips taken today.
    - Compared to the E+C scenario, the E+C+P scenario is expected to have 3.3% less VHT.
- The number of trips are predicted to increase by 31% for both the E+C and E+C+P scenarios.

- Average trip lengths are expected to see a 16% increase, consistent with the anticipated growth on the urban fringe areas identified as future high growth locations.
    - Compared to the E+C scenario, the E+C+P scenario is expected to have 0.1% shorter trip lengths.
- Average travel speeds are expected decrease 9.4%, consistent with the observation that VHT is expected to outpace VMT.
    - Compared to the E+C scenario, the E+C+P scenario is expected to have 3.3% higher travel speeds.
    - Decreasing average trip speeds indicate future roadway congestion, but at a lower congestion level than the E+C network.

Figure 7-4: Existing and 2045 E+C+P Annual ADTs



E+C+P 2045 Traffic Operations

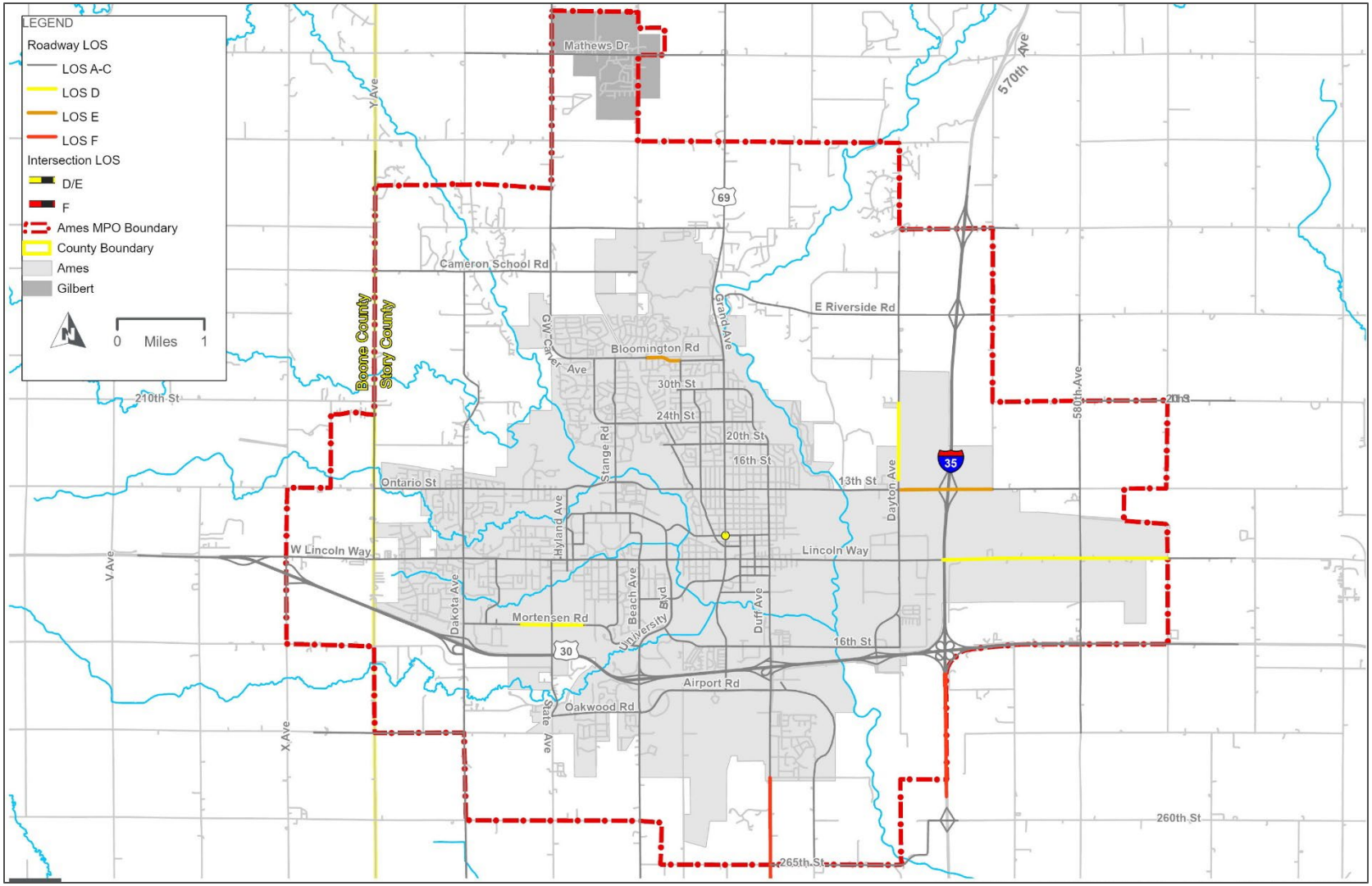
A planning-level assessment of peak hour traffic operations based on the E+C+P 2045 forecasts was conducted using the volume-to-capacity approach described in **Chapter 4: Existing Conditions**. The resulting assessment is shown in **Figure 7-5**. The corridors that are projected to exhibit LOS issues (level of service D or worse) under the E+C+P 2045 scenario are:

- S Duff Avenue, from Ken Maril Rd to 265th Street (assumed developer-driven)
- I-35, south of Highway 30
- Mortensen Road, from Seagrave Avenue to Welch Avenue
- Lincoln Way, from I-35 to 590th Avenue (assumed developer-driven)
- Bloomington Road, from Hyde Avenue to Hoover Avenue
- E 13th Street, from Dayton Avenue to 570th Avenue (assumed developer-driven)
- Dayton Avenue, from E 13th Street to USDA (assumed developer-driven)

The HCM approach used in the future traffic operations analysis identified intersections, in addition to roadway segments, that are projected to exhibit LOS issues under the E+C+P 2045 scenario. The only intersection is:

- Grand Avenue and 6th Street

Figure 7-5: 2045 E+C+P Roadway Level of Service



Regional Policy Options & Strategies

The Forward 2045 plan is a regional document that sets priorities and identifies future projects and programs for implementation. The plan has focused mainly on specific infrastructure projects for implementation, but to augment those projects there are a specific set of regional-based policy options, strategies, and corridors that have been identified as priorities. Those include the following:

- **Bicycle/Pedestrian Master Plan:** Specific bicycle/pedestrian projects are included in this plan update. It is recommended that a detailed Bicycle/Pedestrian Master Plan be developed to identify the appropriate bicycle/pedestrian treatments.
- **Emerging Trends & Technologies:** The Alternatives Development and Evaluation chapter includes potential influencing strategies and treatments that are likely to have the greatest impact in the coming years throughout the Ames area. It is recommended that the MPO develop a committee in order to identify specific implementation actions in regards to emerging trends and technologies. It is also recommended to develop a Transportation System Management & Operations (TSMO) Concept of Operations for the region.
- **Duff Avenue from S. 16th Street to Airport Road:** This project is included in the mid-term constrained plan as a 6-lane facility which includes modifying the interchange configuration. A corridor study is recommended to better identify the lane requirements, interchange configuration and traffic control in order to better identify the overall project cost.
- **13th Street & Grand Avenue Corridor (9th Street to 24th Street):** Projects 16 and 38 are included in the short-term constrained plan. A detailed study is recommended to evaluate traffic operations and develop context-sensitive solutions in order to address the traffic operations deficiencies.
- **13th Street & Stange Road Intersection:** This project is included in the long-term constrained plan. A detailed study is recommended to evaluate the traffic operations and develop context-sensitive solutions in order to address the traffic operations deficiencies.
- **Lincoln Way Corridor Study:** The Grand Avenue Extension to S 16th Street will divert traffic off of Lincoln Way between Grand Avenue and Duff Avenue. The amount of diversion is unknown at this point. It is recommended to conduct a detailed traffic and concept study of Lincoln Way after the Grand Avenue Extension is open. This corridor study would evaluate the traffic operations and identify the operational lane configuration for this corridor.
- **190th Street Corridor Study (520th to US 69):** A detailed study is recommended to evaluate traffic operations and develop context-sensitive solutions in order to address the traffic operations deficiencies.

Chapter 8
Environmental Mitigation

Chapter 8 **Environmental Mitigation**

Environmental Analysis

The transportation alternatives in Forward 2045, particularly the candidate roadway projects, were evaluated as a part of the alternatives assessment for how well they fit within the natural and built environment. State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation were also consulted during MTP development draft plan phase of the study.

Under the National Environmental Policy Act (NEPA) of 1969, Federal agencies are required to consider environmental resources and potential impacts on them during the planning design phase of any project receiving Federal monies. As such, this analysis highlights potential environmental resources that could require further consideration as the alternative projects reach implementation phase in the future.

Environmental Screening / Considerations

Environmental resources that could potentially be affected by transportation projects included in Forward 2045 are discussed in this section. The MTP process included the screening of environmental characteristics for each alternative. Forward 2045 is a regional-scale assessment, and projects included in the MTP would require additional project development prior to implementation. As those project details are developed, more detailed environmental review would be conducted in the future phases of study.

Figure 8-1 and **Figure 8-2** show some of the environmentally sensitive natural and human-built areas in the study area. Discussion regarding the resources shown in the figures, such as historic resources and waters of the United States, are detailed below.

Figure 8-1: Physical Environmental Constraints

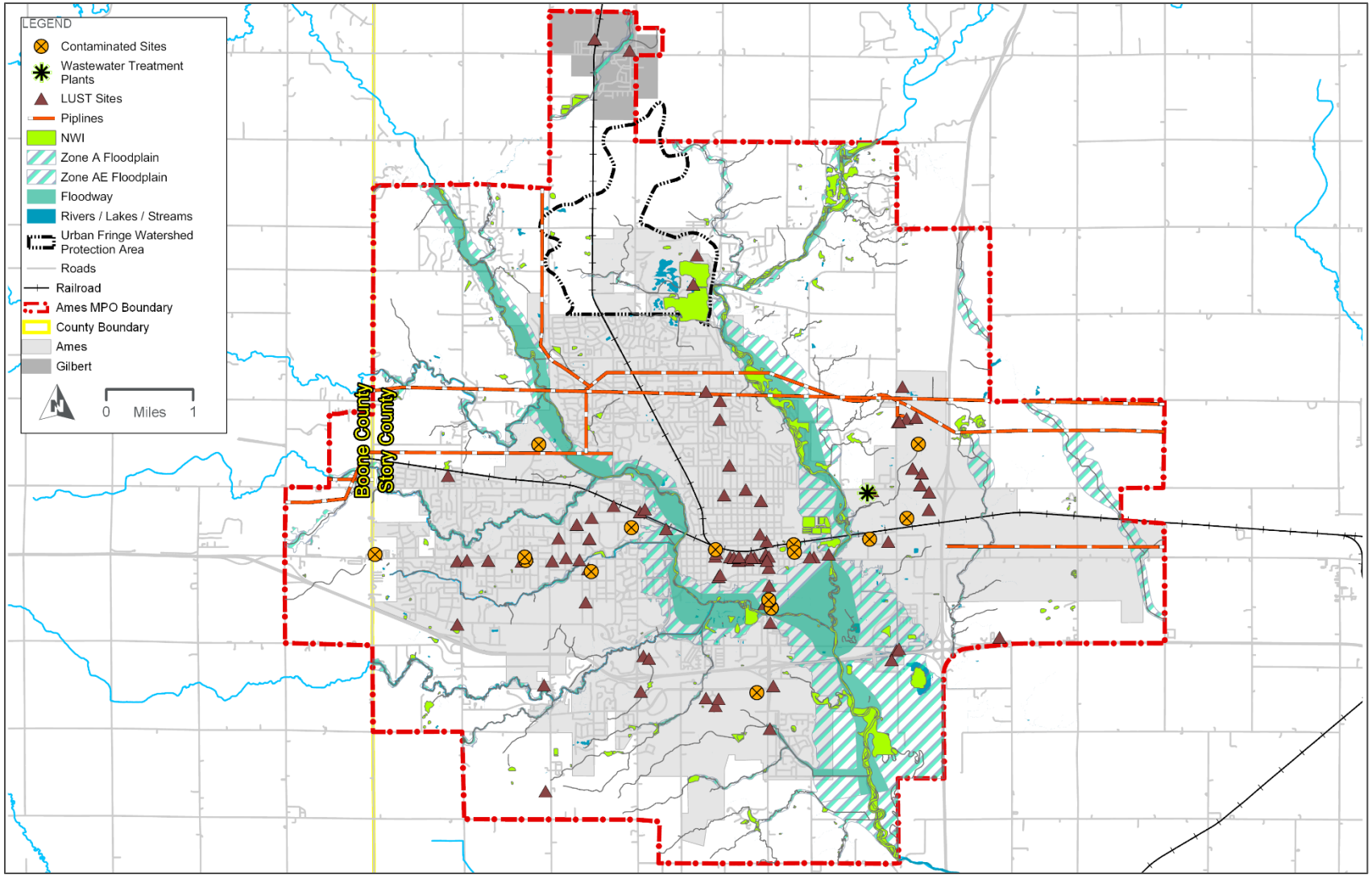
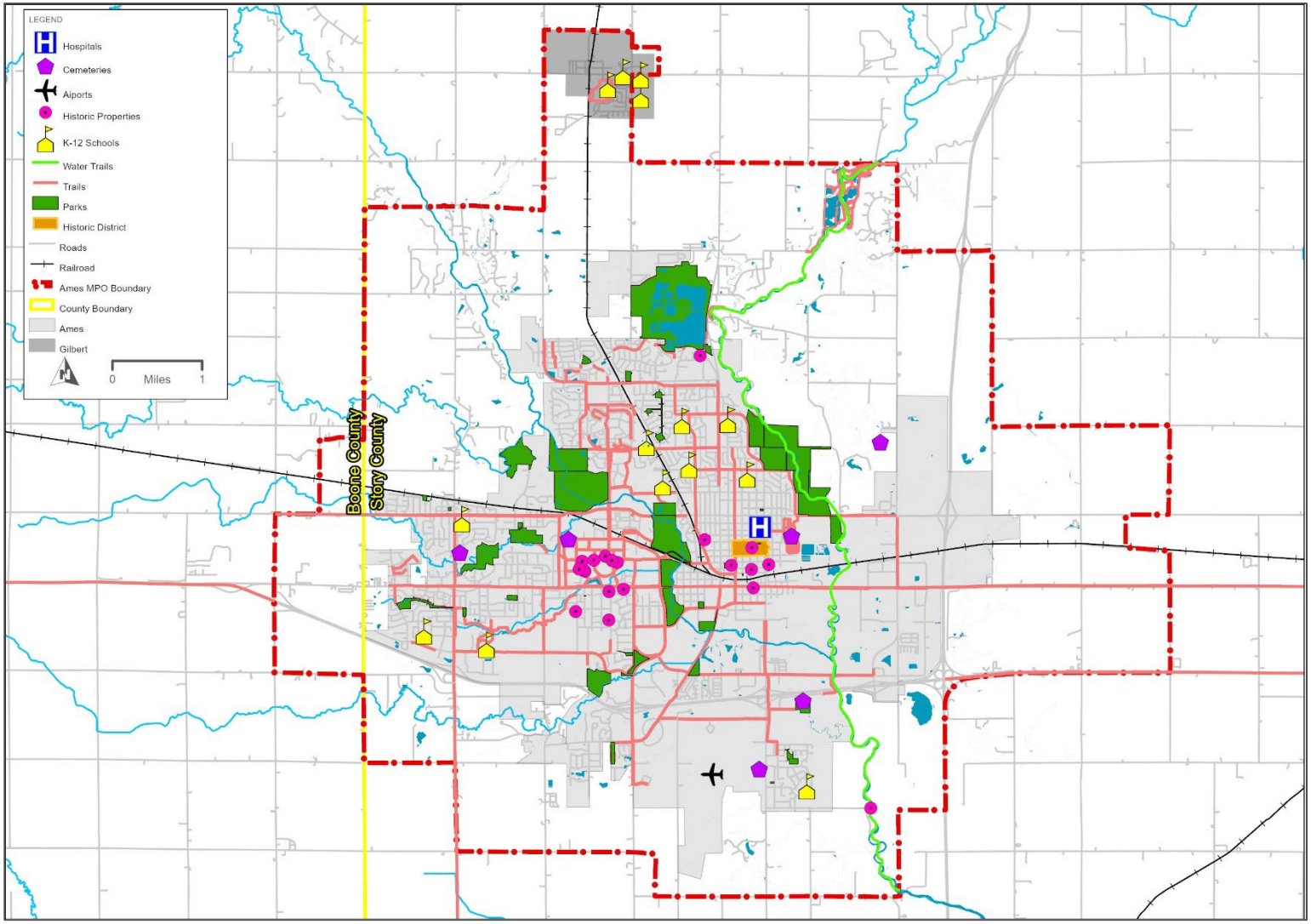


Figure 8-2: Human Environmental Constraints



Archaeological and Historical Resources

The consideration of impacts on cultural resources is subject to several federal laws, regulations and guidelines. Principal among these are NEPA and Section 106 of the National Historic Preservation Act. Section 106 requires federal agencies (and agencies receiving federal assistance for projects) to take into account the effects of their undertakings on historic properties (any prehistoric or historic district, site, building, structure, or object listed on or eligible for listing on the National Register of Historic Places). Through the consultation process among agency officials and other parties, the effects of the undertaking on historic properties are considered, beginning with the earliest stages of project planning. The goal is to identify historic properties within the area of potential effect (APE) as early as possible in project development, evaluate the historic significance of the properties, assess the expected project impacts, and seek ways to avoid, minimize, or mitigate any adverse effects.

Archaeological and historical data from the "I-Sites" public access website, maintained by the Iowa Office of the State Archaeologist were reviewed to determine the number of historic sites within close proximity of roadway alternatives. Several roadway alternatives are within areas with several archaeological sites nearby. As roadway alternatives continue to evolve throughout the project development process, an APE for the project would be proposed by sponsoring agencies (Iowa DOT and local governments). Coordination with the Iowa State Historic Preservation Office (SHPO) would confirm the APE. Records of known historic sites would be searched to determine the presence of historic resources within the APE. The potential for unknown archaeological sites would be determined through site specific cultural resource surveys. Through consultation with Iowa SHPO, the potential for projects to affect historic resources would be determined: No Historic Properties Affected, No Adverse Effect on Historic Properties, or an Adverse Effect on Historic Properties (when a historic resource cannot be avoided). In the event of an adverse effect on historic properties, FHWA must contact the Advisory Council to advise it of the situation, and offer an opportunity for participation in the consultation with SHPO and others to plan measures to minimize harm and, ultimately, to mitigate the adverse effects. The agency sponsoring the project would consult with SHPO and other interested parties to formulate a mitigation plan which would become the basis for a Memorandum of Agreement (MOA) drawn up and executed between FHWA, SHPO, and the DOT or local agency. Execution of the MOA completes consultation under Section 106 unless there are changes or additions to the project.

Section 4(f) and Section 6(f) Resources

The Department of Transportation Act (DOT Act) of 1966 included a provision, Section 4(f), which is intended to protect any publicly-owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state or local significance or any land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site). U.S. Department of Transportation agencies, including FHWA, cannot approve any program or project which requires the use these lands unless:

- There is no feasible and prudent alternative to the use of such land, and the program or project includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use; or
- FHWA determines that the use of the property, including any measures to minimize harm (such as avoidance, minimization, mitigation, or enhancement measures), would have a *de minimis* impact (a determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or refuge for protection under Section 4(f) or a Section 106 finding of no adverse effect or no historic properties affected on a historic property).

There are three types of Section 4(f) impacts: direct use, temporary occupancy, and constructive use. A direct use would be the conversion of public park land into a transportation use and may include *de minimis* impacts. Temporary occupancy is the temporary use of Section 4(f) land for construction operations. Constructive use is proximity impacts, such as noise, of a proposed project that is adjacent, or nearby, to a Section 4(f) property resulting in a substantial impairment to the property's activities, features, or attributes that qualify the property for protection under Section 4(f). Several roadway alternatives are located near parks and other Section 4(f)-protected properties. These alternatives would be further evaluated in the project planning phase.

Section 6(f), which was created as a part of the Land and Water Conservation Act, protects state- and locally-sponsored projects that were funded as part of the Land and Water Conservation Fund (LWCF). These lands cannot be converted to non-park/recreation use without the approval of the National Park Service. Conversion of these lands is allowed if it is determined that there are no practicable alternatives to the conversion and that there would be provision of replacement property. Mitigation for Section 6(f) lands impacted by a project must include replacement with land of at least the same fair market value, and reasonably equivalent usefulness and location relative to the impacted land. The potential for roadway alternatives to impact Section 6(f) lands was evaluated by determining the proximity of alternatives to public parks, recreation areas, and refuges using GIS data from the city of Ames and Iowa DNR. A few alternatives may be located near Section 6(f)-protected lands; further evaluation would be needed in the project planning phase.

Regulated Material Sites

Regulated materials are hazardous substances that are regulated by federal, state, or local entities based on their potential to result in environmental contamination and potentially affect public health. The purpose of an initial regulated materials review is to identify properties that are, or may be, contaminated with regulated materials along the alternatives within the corridor study area so that the presence of these properties may be factored into subsequent alternative selection and design considerations. It is preferable to avoid highly contaminated sites in order to minimize potential additional costs, liability, or schedule delays due to site remediation.

Roadway alternatives were evaluated using GIS data from Iowa DNR to determine the proximity of any national priority sites, non-national priority sites, contaminated sites, and leaking underground storage tanks as defined by Iowa DNR and U.S. EPA. Several roadway alternatives are located near regulated material sites. More detailed assessments of projects moving forward in the planning process would be needed in future environmental reviews.

Wetlands and Waters of the U.S.

For purposes of the Clean Water Act (CWA) and its implementing regulations, the term "waters of the United States" means: all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; all interstate waters, including interstate wetlands; the territorial seas; all impoundments of waters otherwise identified as waters of the United States (U.S.) in the CWA; and all tributaries, as defined in the CWA. Waters of the U.S. are subject to the CWA and are under the jurisdiction of the United States Corps of Engineers (USACE). A permit from USACE is necessary for all projects that would discharge dredged or fill material into waters of the U.S., including wetlands.

For Forward 2045, the National Wetlands Inventory (NWI) and aerial photography were reviewed within the Ames Area MPO study area to determine potential project impacts on wetlands and other waters of the U.S. Several roadway alternatives would potentially affect wetlands and other waters of the U.S. Wetland delineations are recommended in the initial stages of these roadway improvement project to determine the boundaries of wetlands and other waters of the U.S. within the project area and to coordinate with USACE to determine if USACE has jurisdiction over these areas.

Floodplains

Development in floodplains is regulated by the Federal Emergency Management Agency (FEMA) and the Iowa DNR. Iowa DNR floodplain regulations affect only those roadway projects in the floodplains of streams draining over 100 square miles in rural areas and two square miles in urban areas. Projects on streams with drainage areas below these thresholds are regulated by cities and counties. A floodplain permit from Iowa DNR or city or county is required for most projects within a floodplain. A hydraulic review must be completed for projects within floodplains to determine the effect of the project on the water surface elevation of the 100-year flood. FEMA regulations prohibit encroachments in regulated floodways unless it is accompanied by a no-rise analysis that demonstrates the project would cause no increase in the 100-year flood level.

Roadway alternatives for Forward 2045 were reviewed to determine the extent that they would occur within the 100-year floodplain using the latest Flood Insurance Rate Maps showing the extent of the 100-year floodplain in Story County. Several alternatives are located in floodplains and would need to be further evaluated.

Threatened and Endangered Species

Threatened and endangered species listed under the federal Endangered Species Act (ESA) would need to be considered for each project. The State of Iowa also maintains a list of state-listed threatened and endangered species, and species of special concern. Consultation with U.S. Fish and Wildlife Service (USFWS) and Iowa DNR would be required to determine which listed species have the potential to occur within each project area and the potential for the project to affect each species present.

Roadway alternatives were reviewed for their potential to affect protected species by assessing the potential habitat affected by each alternative. Potential habitat does exist along various alternatives. Projects moving forward in the planning process would need further review for their potential to affect species by completing habitat surveys and potential consultation with the U.S. Fish and Wildlife Service and Iowa DNR.

Environmental Justice Assessment

Executive Order 12898 requires federal agencies to achieve environmental justice by identifying and addressing disproportionately high and adverse human health or environmental effects, including the interrelated social and economic effects of their programs, policies, and activities on minority populations and low-income populations in the United States. U.S. Department of Transportation (USDOT) Order 5610.2(A) and FHWA Order 6640.23A define an adverse effect as the totality of significant individual or cumulative human health or environmental effects, including interrelated social and economic effects, which may include, but are not limited to:

- Bodily impairment, infirmity, illness or death;
- Air, noise, and water pollution and soil contamination;
- Destruction or disruption of human-made or natural resources;
- Destruction or diminution of aesthetic values;
- Destruction or disruption of community cohesion or a community's economic vitality;
- Destruction or disruption of the availability of public and private facilities and services;
- Vibration;
- Adverse employment effects;
- Displacement of persons, businesses, farms, or nonprofit organizations;
- Increased traffic congestion, isolation, exclusion or separation of minority or low-income individuals within a given community or from the broader community; and
- The denial of, reduction in, or significant delay in the receipt of, benefits of FHWA programs, policies, or activities.

In accordance with FHWA Order 6640.23A, FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, minority and low-income populations were identified in the area affected by the MTP. Projects identified as part of the Forward 2045 were analyzed to determine if they would potentially disproportionately highly and adversely affect minority and low-income populations in the Ames Area MPO. The City would engage all populations, including minority and low-income populations, in the Long Range Transportation Plan public involvement process to obtain public comments during the planning process. The AAMPO's Public Participation Plan is the basis for the public engagement efforts for the Long Range Transportation Plan update, and provides the direction with the intent of involving all populations within the community.

NEPA documentation for any MTP projects would analyze these populations at a more detailed level, address potential disproportionate impacts to these populations, document efforts to inform minority and low-income populations of proposed road

improvement activities and engage them in the public involvement process, and document efforts to minimize and avoid environmental impacts on the environmental justice populations.

Minority Populations

FHWA defines a minority population as any readily-identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed FHWA program, policy, or activity. FHWA defines a minority as:

- Black: a person having origins in any of the black racial groups of Africa
- Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race
- Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent
- American Indian and Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition
- Native Hawaiian and Other Pacific Islander: a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

The smallest unit for minority groups, which is preferred for analysis, is the census block[25]. Census block data is gathered at the decennial censuses which is currently underway for the year 2020. To account for changes since the 2040 LRTP, which used the 2010 decennial data, data from the 2013-2018 American Community Survey [ACS) was used to determine the number and percentage of minority populations in Ames Area MPO. The ACS is a Census Bureau product that is updated annually but the smallest geographic unit from the 2013-2018 ACS is the census block group which is one grouping larger than the census block[26]. Per FHWA guidance,

[25] Census blocks are statistical areas bounded by visible features, such as streets, roads, streams, and railroad tracks, and by non-visible boundaries, such as selected property lines and city, township, school district, and county limits. Generally, census blocks are small in area; for example, a block in a city bounded on all sides by streets. Census blocks in suburban and rural areas may be large, irregular, and bounded by a variety of features, such as roads, streams, and transmission lines. While there are no defined populations within blocks, they typically contain from 0 to 100 people.

[26] Block Groups (BGs) are statistical divisions of census tracts, and are generally defined to contain between 600 and 3,000 people. A block group consists of clusters of blocks within the same census tract that have the same first digit of their four-digit census block number.

readily identifiable groups of minority persons and clusters[27] of minority populations were identified. A group of minority persons was identified as any census block group with a substantial minority population: where the percentage of minority population was at least one standard deviation (34%) higher than the mean of a typical normal data distribution curve as compared to the percentage of the minority population within the Ames Area MPO boundary. Clusters were identified where a minority population is not substantially greater than the Ames Area MPO average, but due to the large population, the minority population is great enough to be potentially disproportionately and highly adversely affected by the proposed actions of the MTP.

Clusters identified in the Forward 2045 MTP were compared to current data to verify that the clusters identified at the block level were not diluted in the block group level. It is assumed that clusters identified in the 2040 LRTP but not in the current analysis are still present and not identifiable by the block group ACS data. The minority population of the AAMPO area is 22% of the total population; the threshold value used to determine a substantial minority population is 30% (22% multiplied by 1.34). **Figure 8-3** shows the Environmental Justice populations identified.

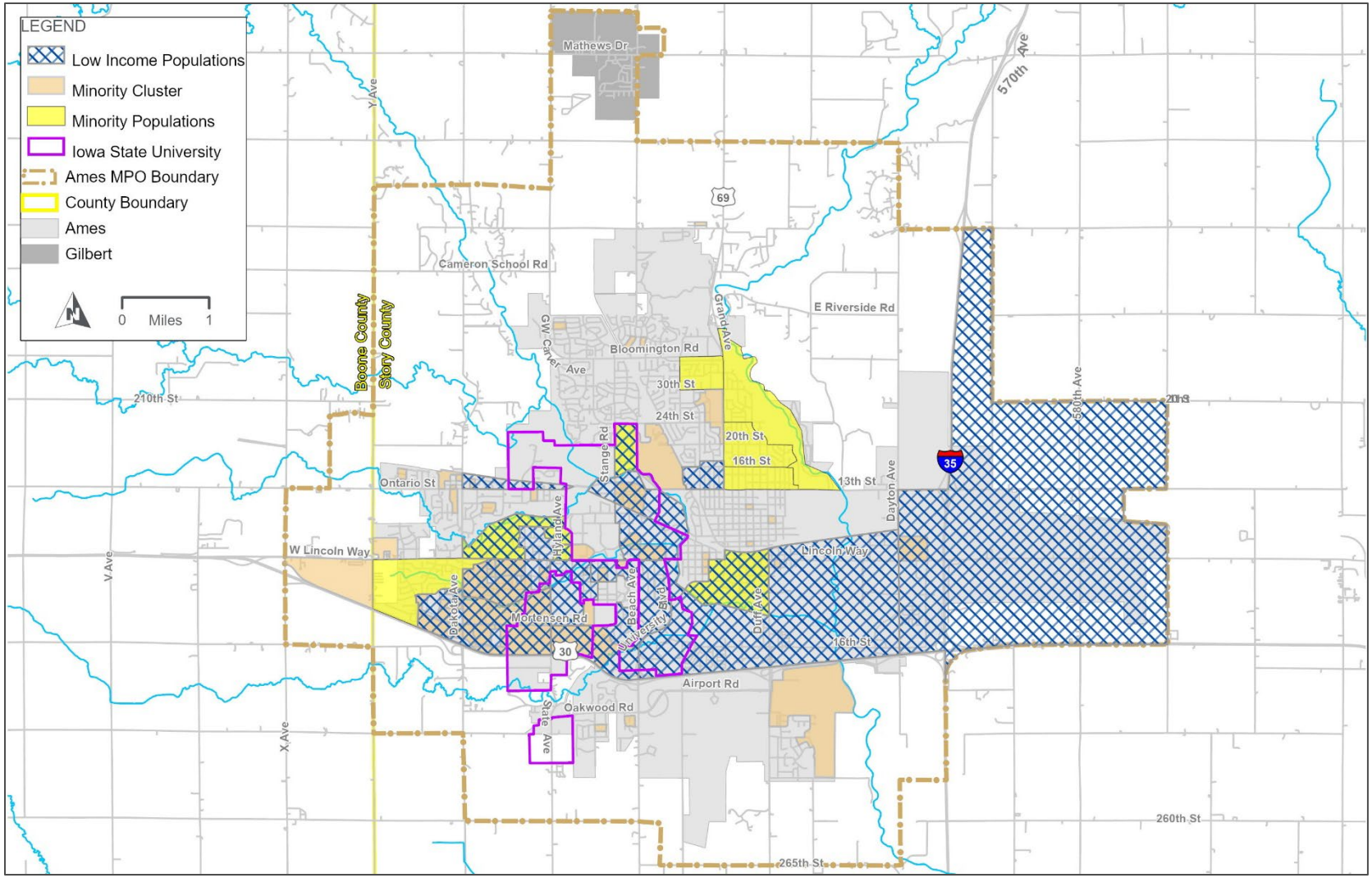
Low-Income Populations

FHWA defines a low-income population as any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed FHWA program, policy, or activity. FHWA defines low-income as a person whose median household income is at or below the Department of Health and Human Services (DHSS) poverty guidelines. The best approximation for the number of people below the DHHS poverty guidelines in a particular area is the number of persons below the Census Bureau poverty thresholds in that area. In this analysis, 2013-2018 ACS was used to determine low-income data for the AAMPO area. The smallest geographical unit available for ACS data is the census block group. Similar to the minority population, a readily identifiable group of low-income population was identified as any census block with a substantial low-income population: where the percentage of low-income population was at least one standard deviation (34%) higher than the mean of a typical normal data distribution curve as compared to the AAMPO area percentage of the low-income population. The low-income population of the AAMPO area is 26% of the total population; the threshold value used to determine a substantial low-income population is 35%.

[27] Clusters are discussed in the December 16, 2011 FHWA memo "Guidance on Environmental Justice and NEPA. The analysis of environmental justice is to include any readily identifiable group or cluster of minority or low-income population.

Figure 8-3 shows the Environmental Justice populations identified. It should be noted that the location of University students has an effect on the results for the Ames area. The student population tends to be younger, and those living away from home have limited income and can heavily influence the low-income population results.

Figure 8-3: Identified Environmental Justice Populations



Fiscally Constrained Projects and Environmental Justice Evaluation

The roadway and bicycle and pedestrian projects selected for the fiscally constrained plan were screened against the environmental justice populations shown in **Figure 8-3**. The purpose of this screening was to assess the potential benefits and impacts these projects could have on neighborhoods with high proportions of minority and/or low-income residents. While the full benefits and impacts related to the fiscally constrained projects are not known at this time, this high-level evaluation provides insight into the relationship between the environmental justice populations and the projects selected for implementation over the next 25 years.

Projects screened through this process are evaluated based on their potential benefits, such as improved access and mobility, and their potential impacts, such as degradation of environmental resources or adverse effects on the adjacent populations. Examples of projects that would impart benefits would be reconstructions, system management, and rehabilitation projects while projects that would impart impacts would be road widenings, new corridors, and grade separations.

Regional Households within Environmental Justice Populations

To better understand the distribution of households that are located within census blocks identified as environmental justice populations, an analysis was performed using the 2015 household totals associated with the TAZs in the AAMPO travel demand model. The analysis found that 54% of the AAMPO households are located within the EJ census blocks while 46% are outside of the EJ census blocks.

Project Proximity to Environmental Justice Populations

The fiscally constrained plan includes 13 roadway projects and 37 bicycle and pedestrian projects. These projects were screened for proximity to environmental justice populations based on a ¼ mile buffer around each project. Project buffers were compared to environmental justice populations of minority and/or low-income residents; project buffers that overlapped EJ geography was considered to have proximity to EJ populations.

- **Roadway Projects**: 11 of the 13 fiscally constrained projects, or 85%, were contained within the ¼ mile buffer.
- **Bicycle and Pedestrian Projects**: 23 of the 25 fiscally constrained bicycle and pedestrian projects were contained within the ¼ mile buffer. Thus, 92% of the fiscally constrained bike and pedestrian projects are accessible to EJ populations.

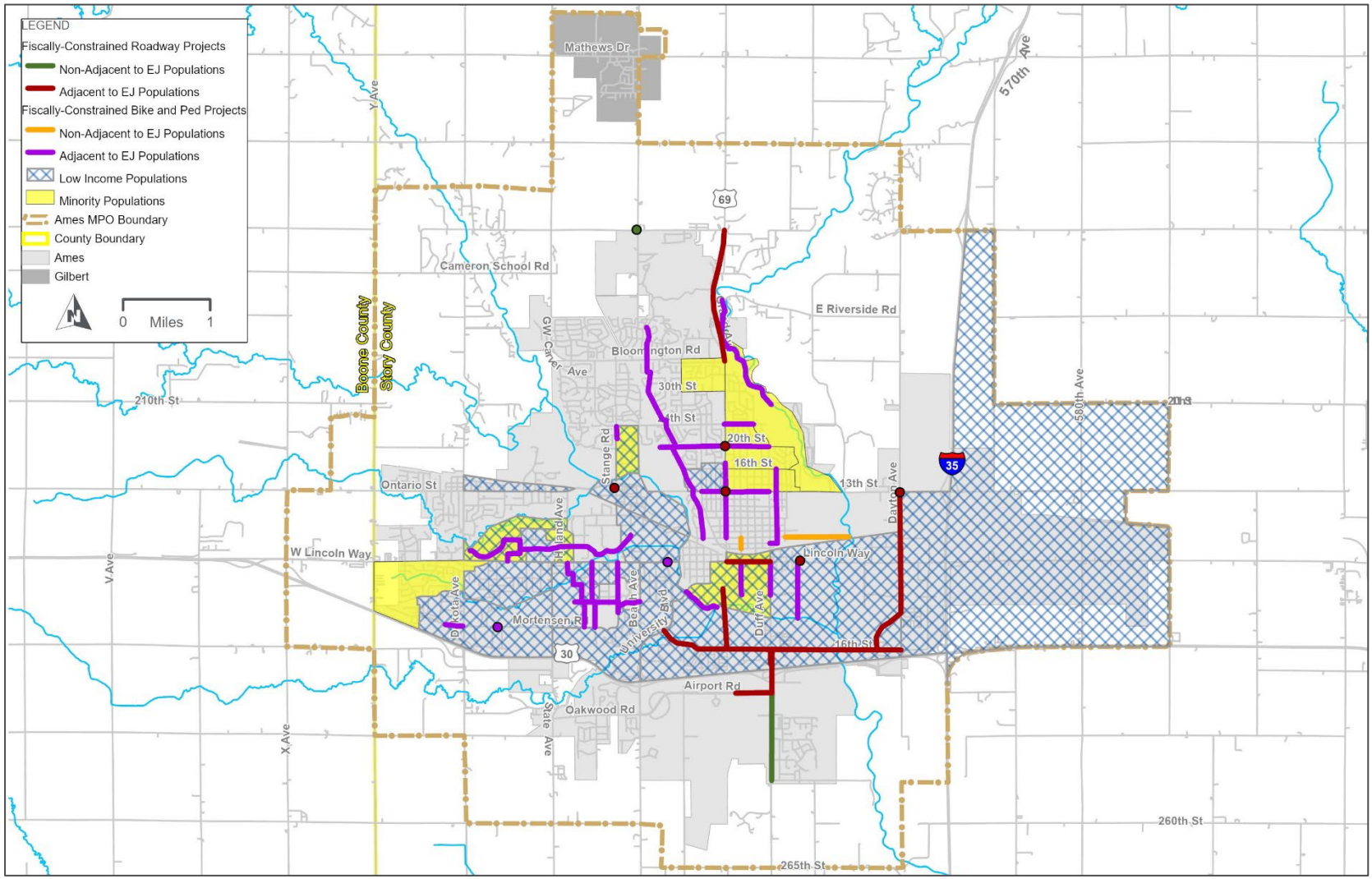
Project Benefits and Impacts

For fiscally constrained roadway projects, nine (9) are lower-impact, non-widening projects that were considered to provide mobility benefits. Four (4) projects include some sort of widening or reconfiguration of facilities that have the potential to be higher-impact projects. There was a higher proportion of "benefit" projects adjacent to EJ population than "impact" projects: 89% of the roadway projects providing benefits are adjacent to EJ populations, while 75% of the potentially higher-impact projects are located in proximity to EJ populations. All of the bicycle and pedestrian projects were considered beneficial, as they have limited impacts to private property and increase overall accessibility and recreational opportunities. The high proportion of bicycle and pedestrian projects (92%) adjacent to EJ populations represents a disproportionate benefit to EJ populations.

Overall, there are a relatively high number of fiscally constrained projects located in proximity to environmental justice populations. However, the majority of these projects are lower-impact and provide benefits in terms of enhanced mobility and access for neighborhoods with higher proportions of minority and/or low-income residents. Thus, these projects are considered to be investments in the EJ population areas. Direct impacts on environmental justice populations should be limited to the extent practical during the project development phase.

Figure 8-4 illustrates which of the fiscally constrained projects are adjacent to environmental justice populations.

Figure 8-4: Fiscally-Constrained Projects Proximity to Environmental Justice Populations



Chapter 9
MTP Engagement

Chapter 9 **MTP Engagement**

Public and Stakeholder Engagement

The AAMPO strives to make the creation and development of the Forward 2045 MTP a community-driven process. The overall goal for Forward 2045 MTP public engagement was to educate the public and stakeholders on the Forward 2045 effort and allow audiences ample opportunities for engagement and input on the planning of Ames' future transportation network. The engagement process was conducted in accordance with the AAMPO's Public Participation Plan, which can be found at: http://www.cityofames.org/home/showdocument?id=27726.

To solicit feedback from Ames area residents, the AAMPO utilized a variety of outreach methods and events to provide opportunities for idea sharing, collaboration, awareness and consensus in the planning process. In addition to the public outreach, Federal and state agencies that have potential to be impacted by the Plan were contacted. Public engagement materials and the Federal and state agency contact materials for the Forward 2045 MTP can be found in **Appendix A**.

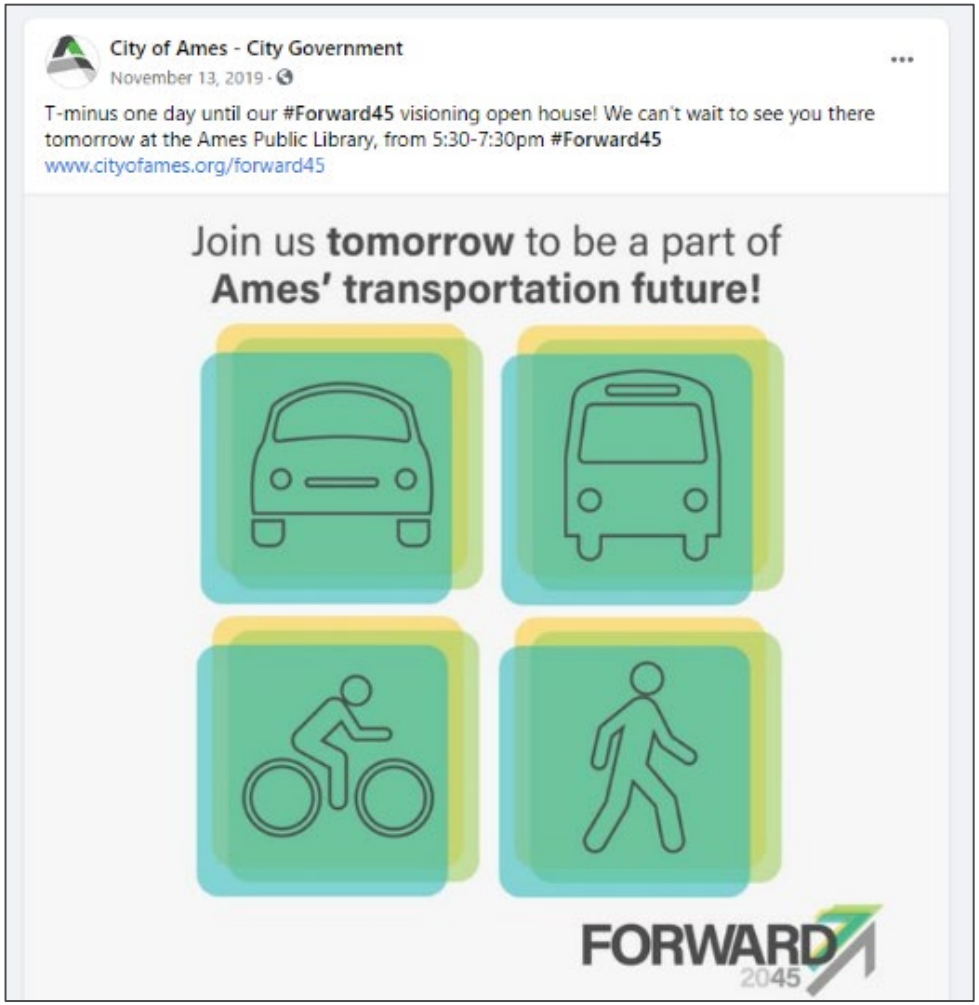
Website

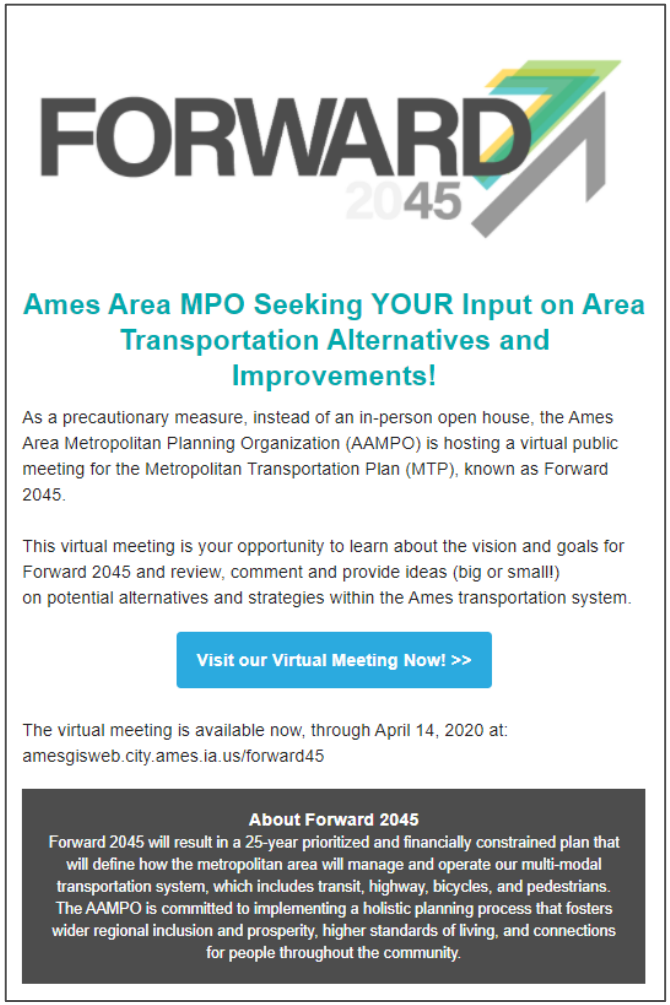
The project website, www.cityofames.org/forward45, served as the primary means for interested individuals to learn more about the Forward 2045 MTP effort and participate in input opportunities. The website page included:

- Two videos. The first video provided an overview of what an MTP is and why it is important to the Ames community. The second video provided a brief overview of the goal areas that were used to guide the Forward 2045 MTP.
- Project schedule.
- Links to open house and online meeting materials.

Social Media & Email

The AAMPO used the City of Ames' existing Facebook and Twitter platforms to create awareness of the MTP process and promote input opportunities, such as open house events and online meetings. The AAMPO also partnered with other organizations, such as CyRide, to share posts on their social media feeds to maximize the audience. These outreach methods supplemented traditional methods such as press releases and direct mail invitations to stakeholders.





Statistically Valid Regional Travel Survey

The AAMPO conducted a regional transportation survey of residents during fall 2019 in support of the Forward 2045 MTP update. 404 people participated in a statistically-valid survey regarding multi-modal transportation issues and opportunities relating to transportation planning and improvements within the region. Survey results revealed how Ames residents feel about the current state of the transportation system and hopes for the future of the transportation system. The figures on this page illustrate some of the key findings from this survey.

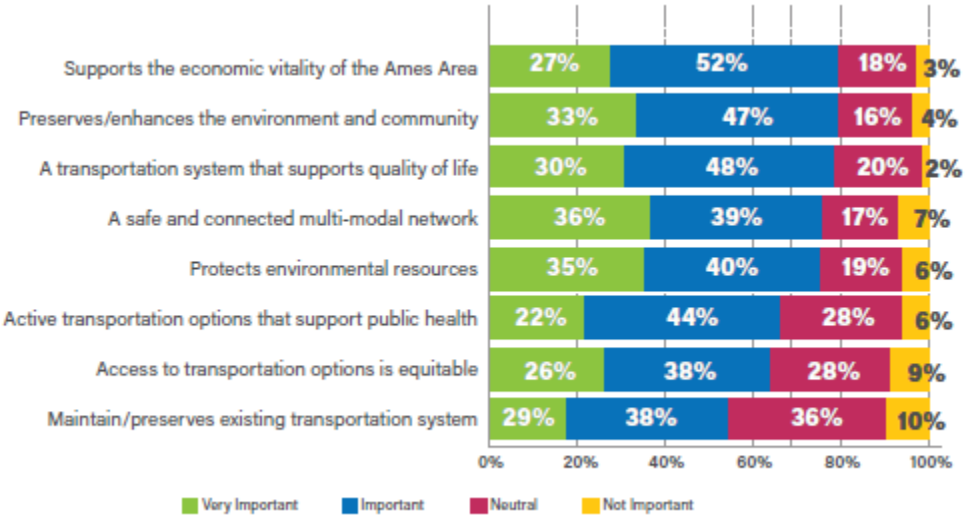


Figure 9-2: Importance of Long-Range Goals

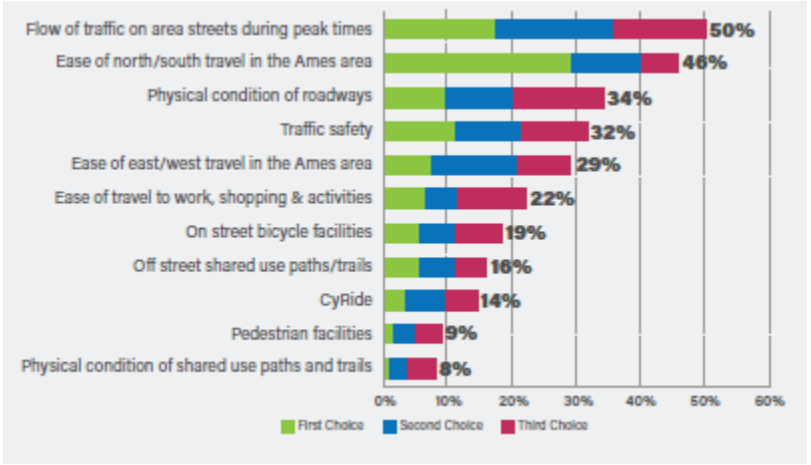


Figure 9-1: Most Important Transportation Issues

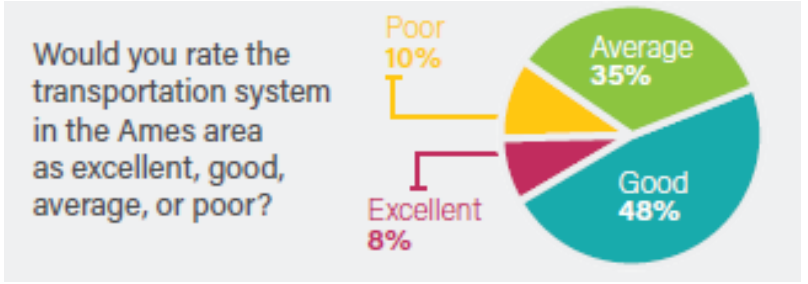


Figure 9-3: Overall Ames Transportation Rating

In-Person and Online Events

The AAMPO hosted open house events to solicit feedback at key milestones during MTP development. All open houses were advertised through traditional means, such as press releases and direct mail invitations, in addition to the AAMPO's website and social media channels.

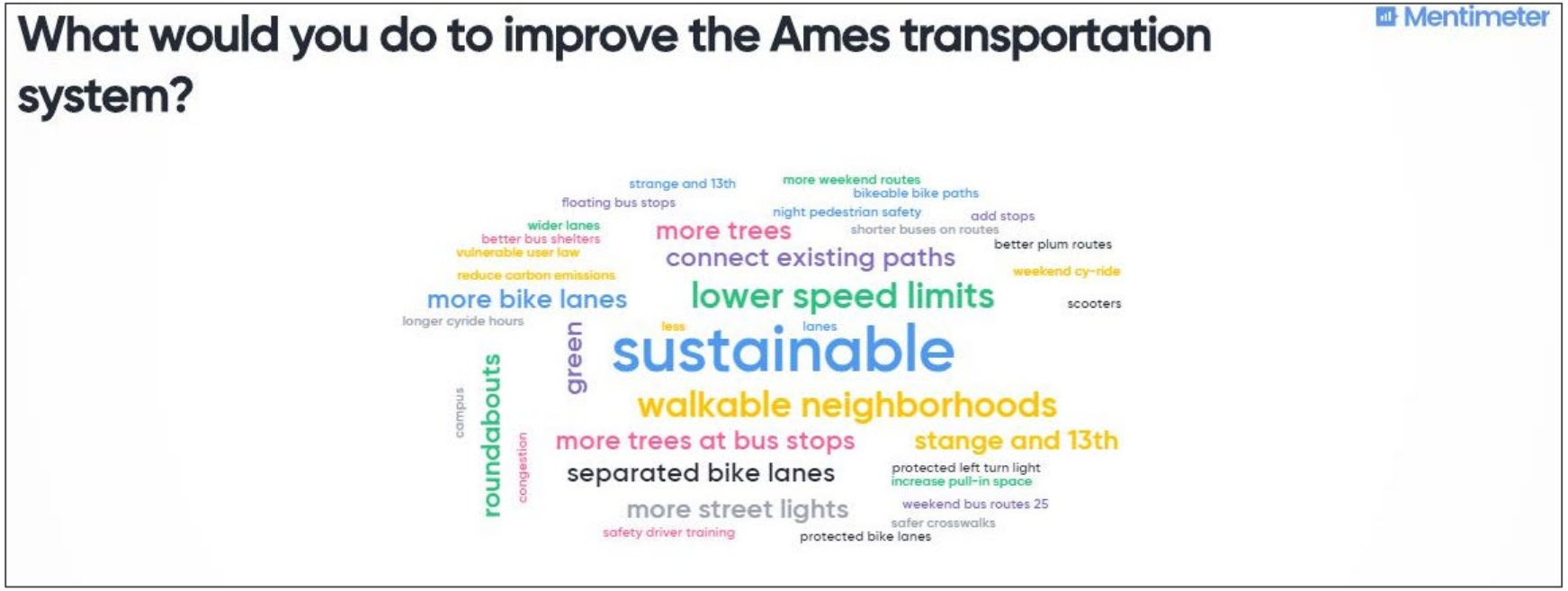
Visioning Open House

On November 14, 2019, the AAMPO hosted a Visioning Open House for the public to contribute ideas to establish a transportation vision and goals for the Forward 2045 MTP. The open house was held in the Ames Public Library in Ames, Iowa.

The open house utilized the following interactive activities to engage the public and stakeholders in sharing their thoughts and ideas:

- **Mapping Exercises:** Attendees were encouraged to identify the issues they faced when traveling on the Ames transportation system, including roads, bicycle and pedestrian facilities and transit, using color-coded stickers on large plot maps of the Ames metropolitan area.

- **Vision Priorities Exercise:** A large board presented potential transportation priorities that could be reflected in the Forward 2045 MTP. Attendees were provided three stickers and asked to choose their top three priorities.



- **Transportation Improvement Station:** This station provided the opportunity for attendees to provide their input on what they would do to improve the Ames transportation system through an online survey tool. Results from this exercise can be found in **Figure 9-4**.

Figure 9-4: Improvements to the Ames Transportation System

Online Visioning Open House

In conjunction with the in-person Visioning Open House event, the AAMPO hosted an online event at amesgisweb.city.ames.ia.us/forward45 to provide an additional input opportunity during this important planning milestone. The online Visioning Open House replicated information and activities from the in-person meeting.

Online Community Transportation Assessment Survey

During the visioning phase, the AAMPO conducted an online survey to gain a better understanding of transportation behavior in Ames. The survey was open from November 5, 2019 through November 27, 2019, and during that time 182 individuals responded to the survey. The survey was promoted primarily through City of Ames social media pages, on the website and at the in-person and online Visioning Open House.

As shown in **Figure 9-6**, the results of the survey indicate that the majority of respondents commute to work or school in a car or vehicle alone, while 9.85% of respondents use public transit and 8.33% commute via bicycle.

When asked what would encourage respondents to use a mode of transportation other than driving a personal vehicle to complete daily trips, respondents indicated that expanded transit service coverage, more bicycle and pedestrian connections or nothing would change their mode of transportation. **Figure 9-5** summarizes the breakdown of responses.

Figure 9-6: What Method of Transportation Do You Normally Use to Go to School/Work?

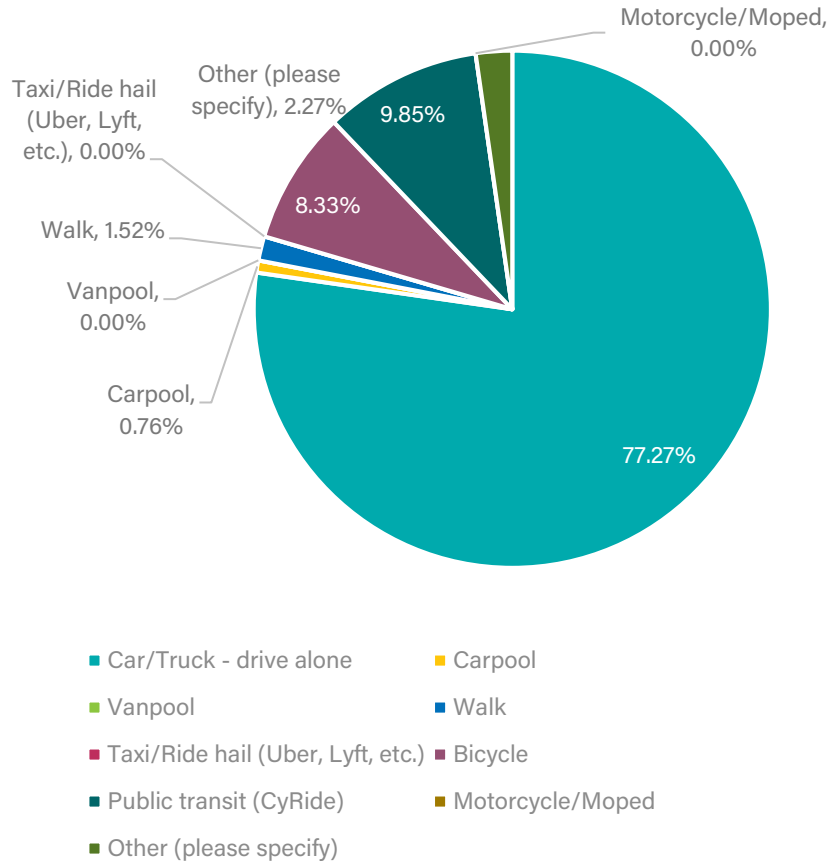
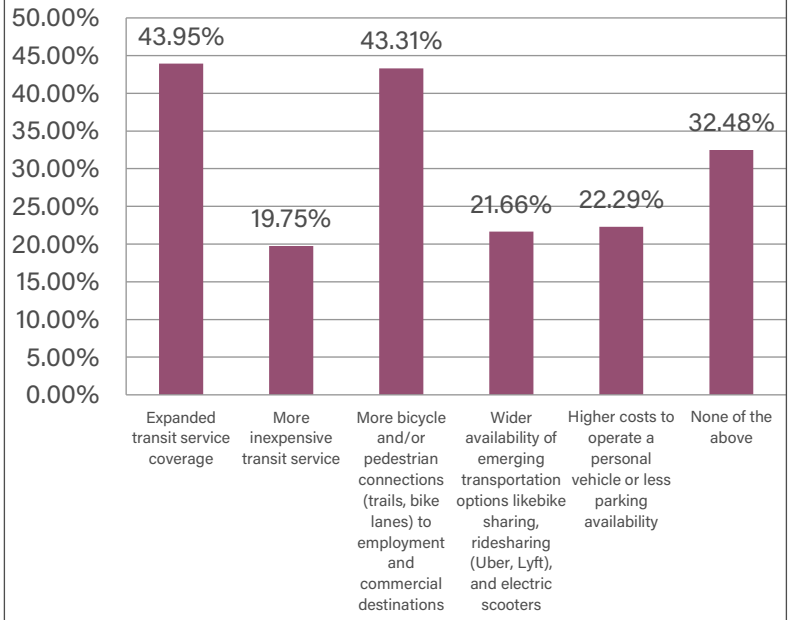
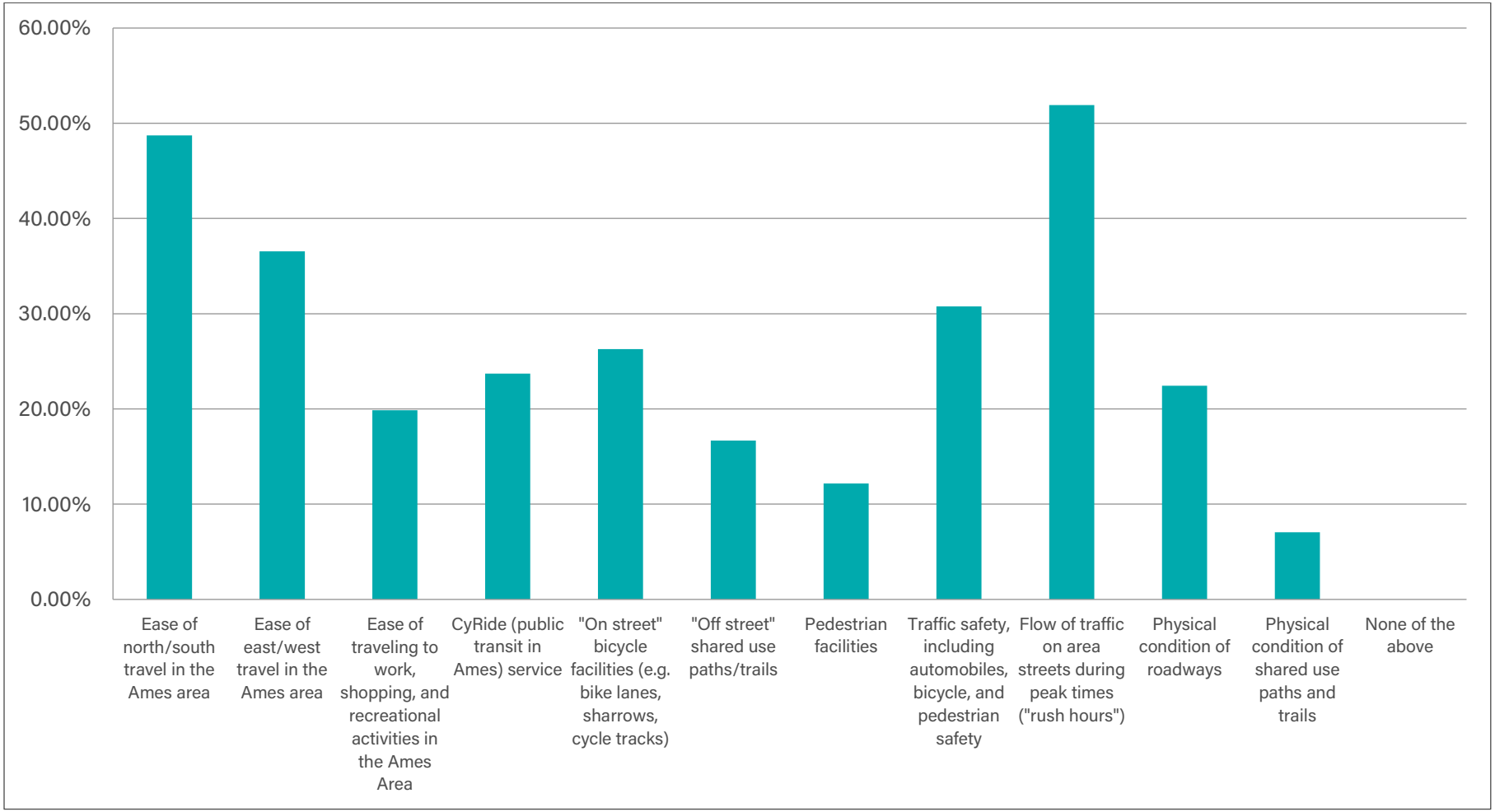


Figure 9-5: Which THREE of the Following Would Encourage You to Use a Mode of Transportation Other than Driving a Personal Vehicle to Complete Your Daily Trips?



The survey also asked respondents to choose the top three transportation issues in Ames. The top three issues, as shown in **Figure 9-7** were roadway-centric, with respondents indicating that flow of traffic on area streets during peak times, ease of north/south travel in Ames and ease east/west travel in Ames were issues.

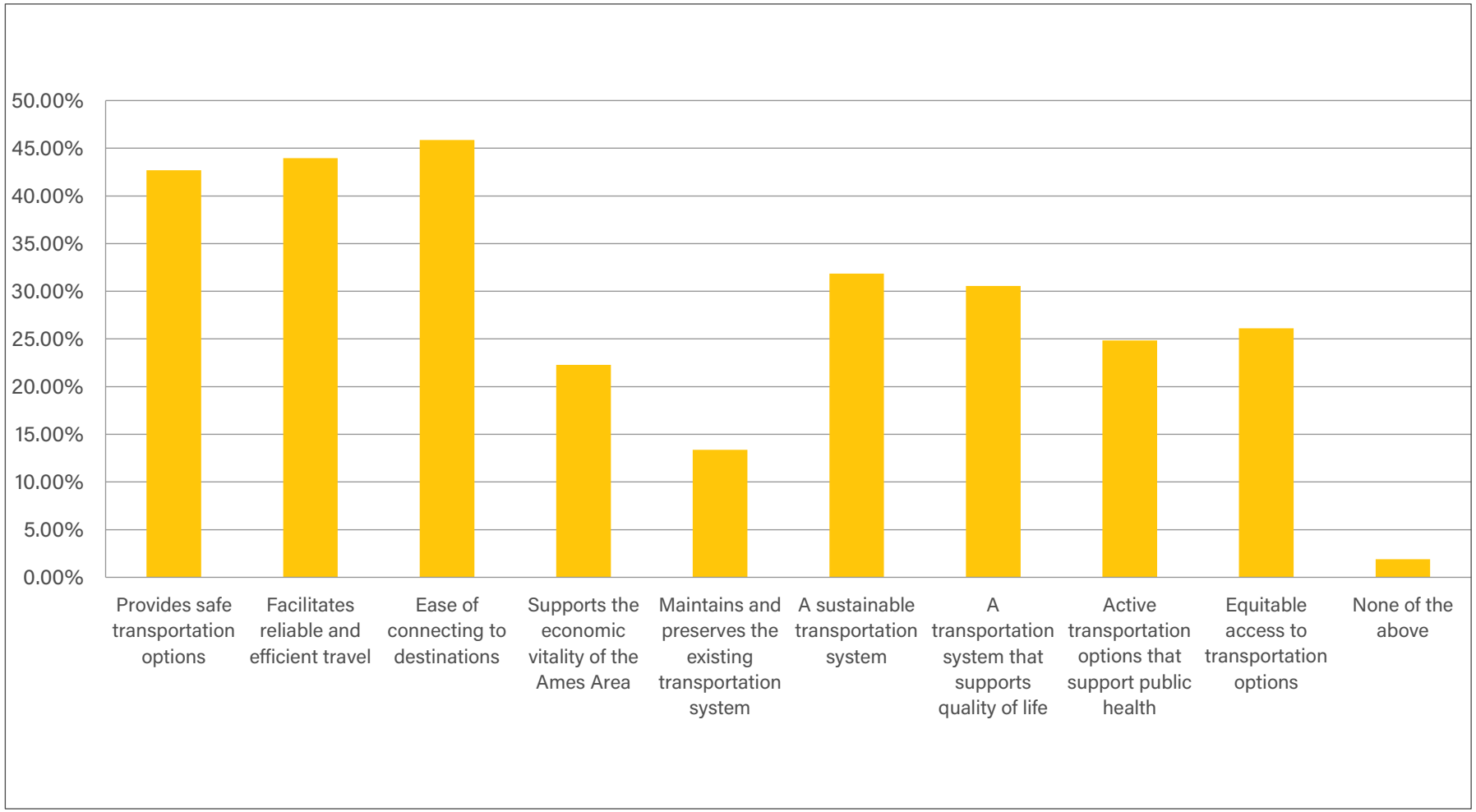
Figure 9-7: Which THREE of the Items below Do You Think are the Most Important Transportation Issues?



Respondents were then asked to focus on the future by identifying the top three characteristics they thought were most important for the future of the Ames area transportation system. The top three most important characteristics were ease of connecting to

destinations, reliable and efficient travel, and safe transportation options. These characteristics are shown in **Figure 9-8** and were reflected in the goal areas for the Forward 2045 MTP.

Figure 9-8: Which THREE of the Following Characteristics of the Ames Area Transportation System Do You Think are Most Important for the Future

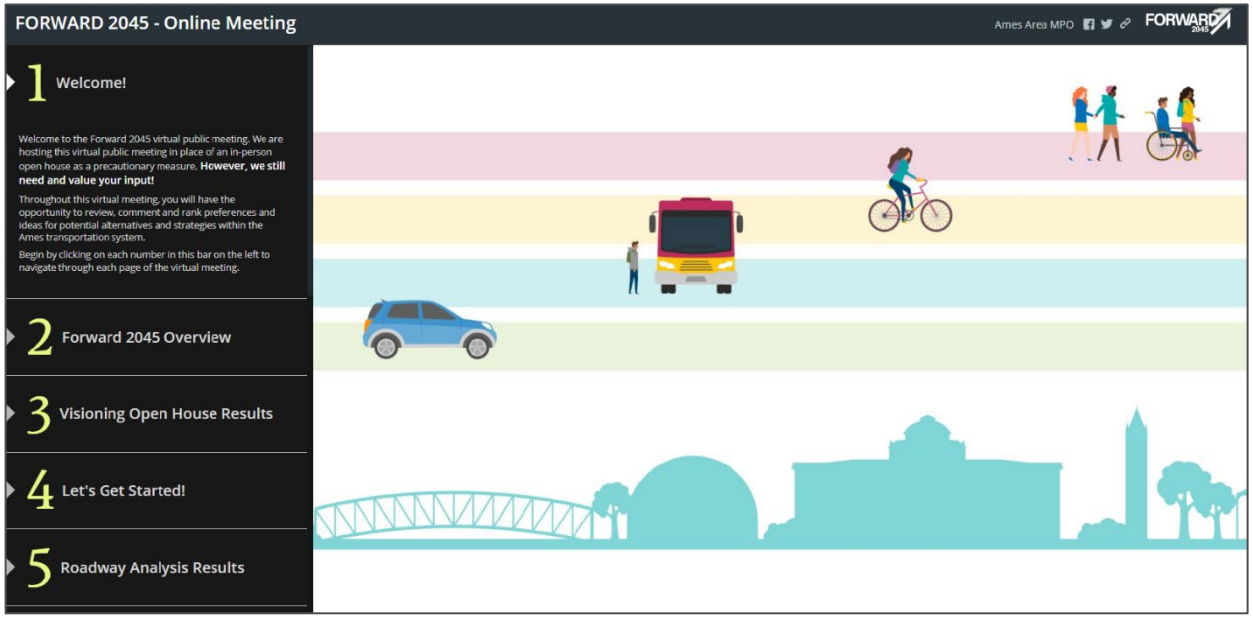


Alternatives & Strategies Virtual Open House

The AAMPO planned a second in-person open house for March 2020 to allow the public and stakeholders a chance to review, comment and provide ideas on potential alternatives and strategies within the Ames transportation system. Due to the COVID-19 pandemic, the AAMPO cancelled the in-person event as a precautionary measure and opted to host a virtual meeting at amesgisweb.city.ames.ia.us/forward45 from March 31, 2020 through April 14, 2020.

The virtual meeting utilized the following interactive activities to engage the public and stakeholders in sharing their ideas for alternatives and strategies:

- **Mapping Exercises**: Participants were asked to select their preferred proposed roadway, bicycle and pedestrian and transit strategies and map them on an interactive online mapping tool. Participants could learn more about each proposed strategy by clicking on a reference sheet that provided an overview and pros and cons for each strategy. The purpose of this exercise was to solicit input on which strategies participants would like implemented in the Ames area.



- **Emerging Technologies Prioritization**: Participants were provided a reference sheet to learn more about the ten proposed emerging trends and technologies. They were then asked to rate how important it was to them that each technology is incorporated in Ames.

The virtual meeting received approximately 400 views while it was open for input. From the mapping exercises and surveys, AAMPO received over 200 unique comments.

Online Alternatives and Strategies Open House Results

The resulting input from the public during the Online Alternatives and Strategies Open House are shown in **Figure 9-9**, **Figure 9-10**, and **Figure 9-11**. **Figure 9-9** shows the results for the roadway strategies exercise. As indicated in the figure, roundabouts and signal timing projects were popular selections by the public. **Figure 9-10** displays the public comments for potential bicycle and pedestrian projects in the region; bike lanes, high-visibility crossings, and new/improved sidepaths were the most common responses from the public. **Figure 9-11** shows public comments for improvements to CyRide's fixed-route system. Most responses for this part of the online open house highlighted areas for new transit routes or extensions of current routes, especially in the Campustown and Southwestern areas of the City of Ames.

Figure 9-9: Public Comments for Potential Roadway Strategies

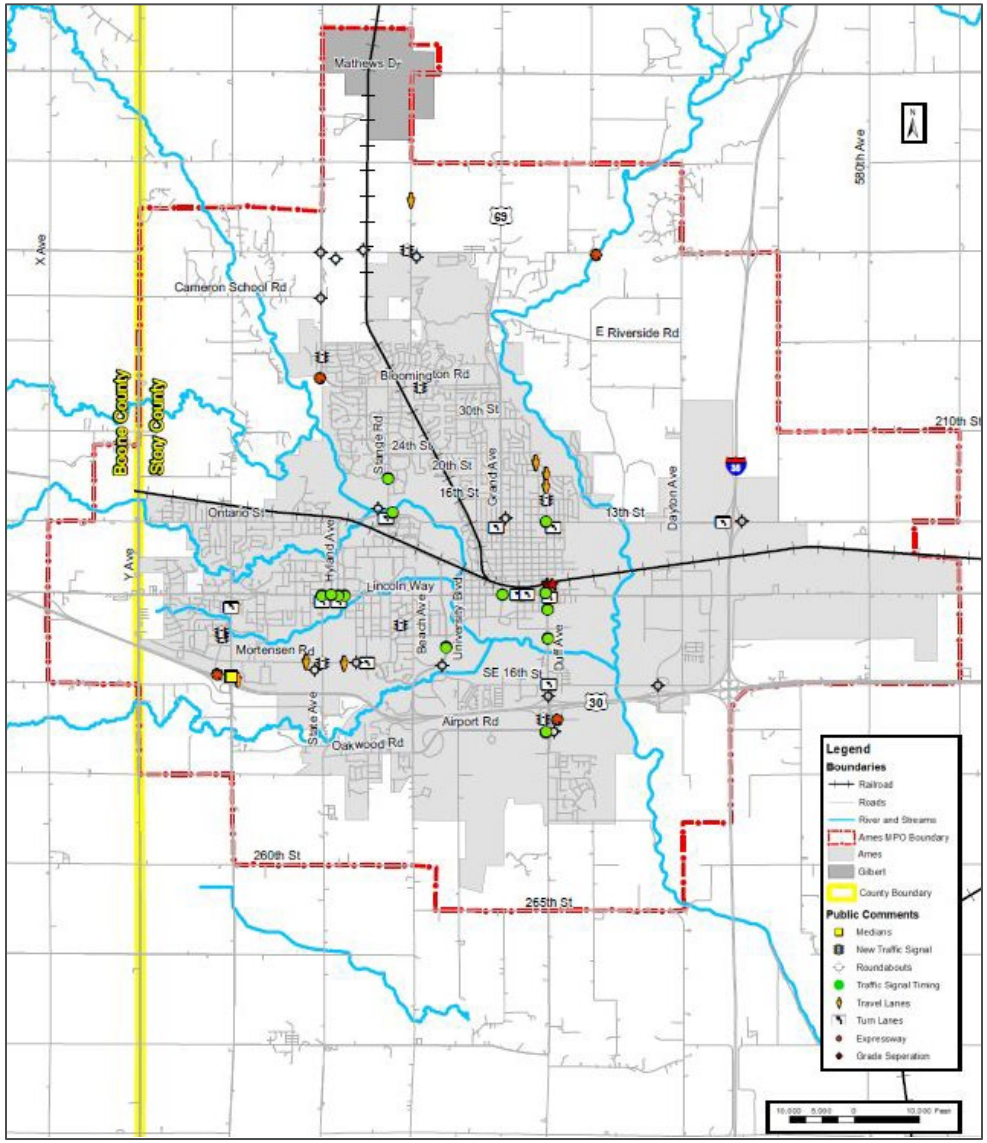


Figure 9-10: Public Comments for Potential Bicycle and Pedestrian Projects

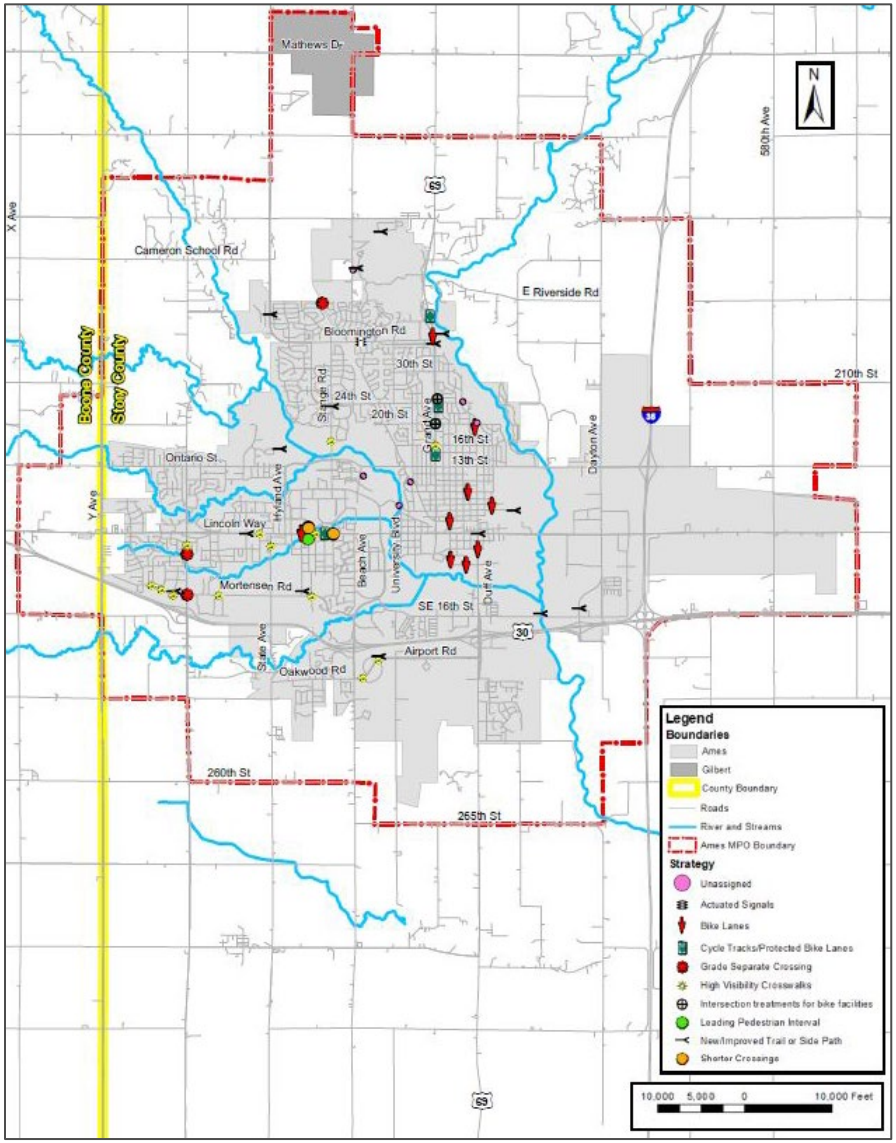
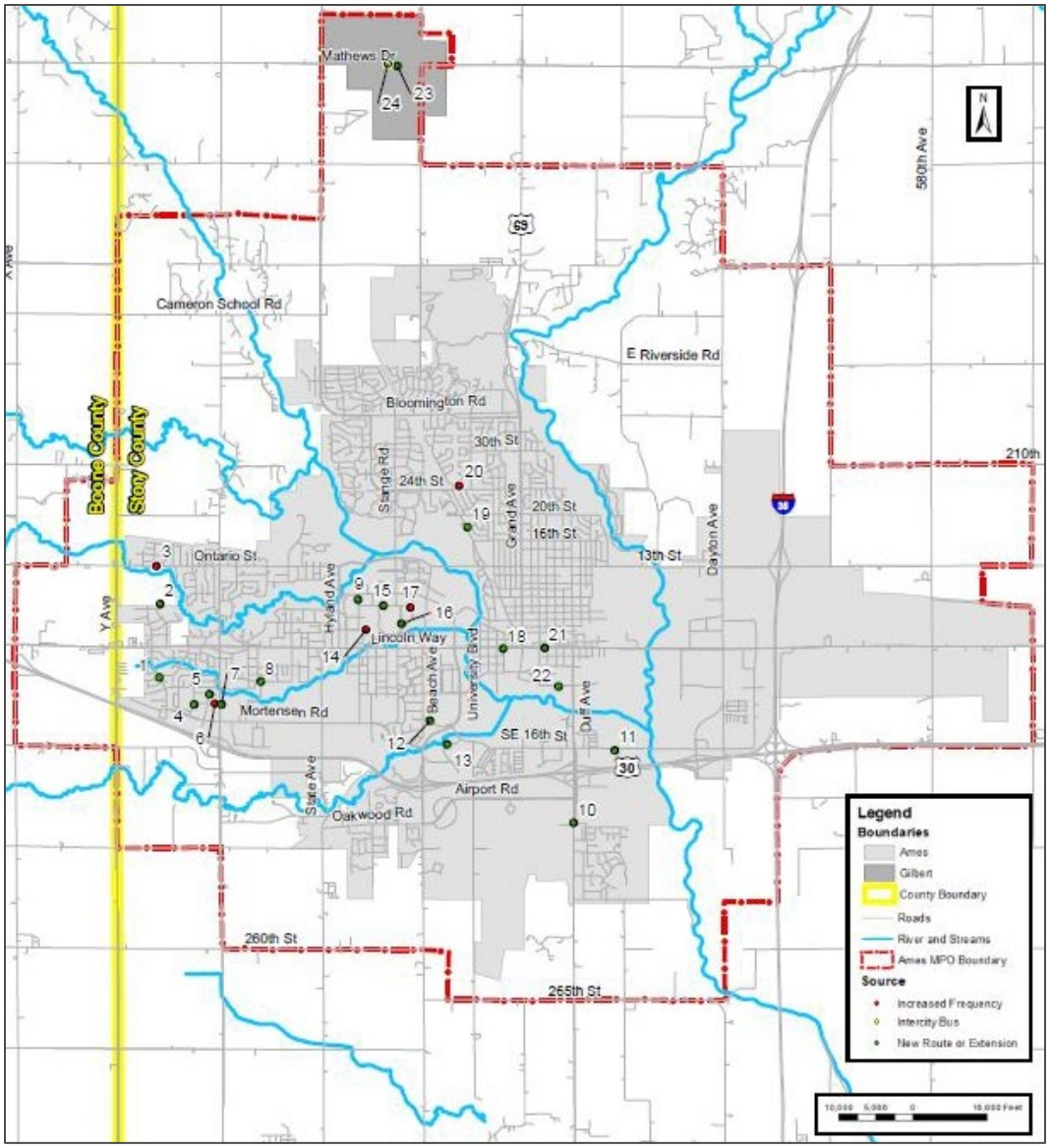


Figure 9-11: Public Comments for Potential Transit Projects



Transportation Policy Committee Meetings

The AAMPO is governed by the Technical Policy Committee (TPC), which provides policy direction for the development of regional long-range transportation planning. The TPC is composed of representatives from the City of Ames, City of Gilbert, Boone County, CyRide and Story County. The Iowa DOT, FHWA, FTA and Iowa State University serve as advisory, non-voting members. The MTP team met with the TPC to provide updates at key milestones:

July 14, 2020

- Issues/Visioning Process
- Vision, Goals, & Objectives Development
- Performance Based Planning Approach
- Alternatives Development

September 8, 2020

- Alternative Evaluation
- Draft Fiscally Constrained Plan

September 22, 2020

- Present draft Metropolitan Transportation Plan

October 27, 2020

- Adopt Metropolitan Transportation Plan

Meeting agendas and minutes for TPC updates can be found at: https://www.cityofames.org/government/aampo/about-the-mpo/transportation-policy-committee.

Chapter 10
FAST Act Compliance

Chapter 10 **FAST Act Compliance**

Metropolitan transportation plans are Federally-required to be developed through a performance driven, outcome-based approach. The Forward 2045 plan has adopted this approach throughout, framing the overall vision through a combination of Federal, state, and locally-tailored performance objectives. This chapter demonstrates how the Forward 2045 plan supports the national transportation planning factors and the Federal requirements for Metropolitan Transportation Plans.

As noted in **Chapter 1**, there are 10 Federal metropolitan transportation planning factors. These planning factors were considered in the Forward 2045 planning process. **Table 10-1** shows how each of these planning factors into the Forward 2045 planning process from different perspectives:

- **Plan Goals and Objectives**: a detailed summary of how each plan objective fits with the national planning factors is provided in **Table 10-1**
- **System Performance Measures**: these are the Federal system performance measures the MPO reports and are included in this document, and the locally-developed system performance measures summarized for the fiscally constrained plan in **Chapter 7**; these are the scoring criteria outlined in **Chapter 6** that were used to identify those projects that best fit with the overall goal areas of the plan.

Table 10-1: Forward 2045 Planning Element Consistency with National Planning Factors

National Planning Factor	Forward 2045 Planning Element		
	Plan Goals and Objectives	System Performance Measures	Project Scoring Metrics
Economic Vitality	▲		▲
Safety	▲	▲	▲
Security	▲		▲
Accessibility and Mobility for People and Freight	▲		▲
Environment, Energy Conservation, Quality of Life and Economic Development	▲	▲	▲
System Integration and Connectivity for People and Freight	▲		▲
Efficient Operation and Management	▲	▲	▲
Preserve the Existing Transportation System	▲	▲	▲
System Resiliency and Reliability; Reduce or Mitigate Stormwater Impacts	▲	▲	▲
Enhance Travel and Tourism	▲		▲

The planning approach for this document supports 23 CFR § 450.322 Metropolitan transportation planning process for developing a Metropolitan Transportation Plan. Specific to those requirements, this document provides the Ames area with:

- A 20-Year planning horizon with both long-range and short-range multimodal strategies and actions.
- Forecasts of future person and goods demand.
- Congestion Management Strategies.
- Identification of existing and proposed multimodal facilities.
- Support for transportation and traffic management systems.
- Capital investment measures to preserve the transportation system and enhance regional mobility.
- Proposed transportation strategies and improvements in sufficient detail for cost estimates.
- A multimodal evaluation of the plan's transportation, socioeonomic, environmental, and financial impacts.
- Identification of projects that require further study.
- Consideration and reflection of local comprehensive plans and other national, state, and local plans, goals and objectives.
- Identification of transportation enhancement activities.
- A financial plan that demonstrates the consistency of proposed transportation investments with already available and projected sources of revenue.
- Consultation with state and local agencies responsible for other planning activities.
- Safety element that discusses priorities, goals, and countermeasures.

Comments on the Draft MTP - 9/18/2020

Comments Received from 9/18/2020 to 10/22/2020

Public/Agency Comment

	Comment	Action	Status:
ISU Comment	16th Street from University Blvd to Apple Place should be shown as a committed project.	Add this project to committed project table and map. (Table 7-1, Figure 7-1, Figure 7-3)	Addressed
CyRide Comment	The Intermodal Facility is not funded by CyRide (students, ISU & City). Just ISU and the City fund the Intermodal fyi. Can you change the text on #6? From: Facility is new in 2012, but some improvements like lot resurfacing are anticipated by 2045. Assume some cost sharing with City. To: Facility is new in 2012, but some improvements like lot resurfacing are anticipated by 2045. Costs will be divided between the City of Ames and Iowa State University.	Update text in Transit Plan (Table 7-11)	Addressed
CyRide Comment	Transit Asset Management Plan: Also, CyRide will be updating its TAM Plan numbers for its fleet & equipment on 9/23/00. We will forward the TAM Plan to the AAMPO shortly after 10/1/2020 fyi. It is up to the AAMPO whether to adopt these new percentages or not. Do you want those new percentages for the MTP? The board will likely approve the following on 9/23.	Update the TAM numbers (pg 59). Upon further discussion with AAMPO, it was decided to leave the targets as is since they have not been adopted by the AAMPO Policy Board yet.	Addressed
City of Ames Comment	Where did you get the pavement management data used in Chapter 3 (page 37)?	Send pavement management data that was provided.	Sent
	Update some Figure and Table numbers that need corrections.	Review and updated figure and table numbers.	Addressed
	Locations of schools shown on Figure 8-2 is outdated.	Update current location of schools in the area.	Addressed
FTA 10/2	Chapter 4, Page 79, paragraph2, line 2 – incorrect word - "…themselves without human intervention, and (t)he ability to meet travelers at their front door."	Corrected misspelling	Addressed
	Chapter 6, Page 109 – Grade Separation – Should this box also include a definition for grade separation for roadways, as well	Grade separation definition revised to apply to both railroads and roadways	Addressed
	Chapter 6, Page 117 – Transit-Oriented Development – Most of the boxes look like they contain definitions. However, this TOD box doesn't define the term. Should a definition of the term be included? There is a nice, simple definition of the term at this location: www.transit.dot.gov/TOD	Added TOD definition to box	Addressed
	Chapter 6, Page 119, Figures 6-3 – You might want to choose a different color for either the county boundary or the medium scoring projects. The lines look identical at first glance.	County boundary color changed	Addressed
	Chapter 6, Page 119, Figures 6-3 thru 6-5 – I think these figures would benefit from more description in the text on page 118. I found myself trying the project that matched the project numbers on the maps. I think the numbers match up with the fiscally constrained projects in the Chapter 7 tables. If this is correct, it would be nice if Figures 6-3 thru 6-5 contained a reference to the corresponding table in Chapter 7.	Reference to FC plan added to this section	Addressed
	Chapter 6, Page 125 – Should this section reference Chapter 9 – MTP Engagement?	Reference to chapter 9 added	Addressed
	Chapter 7, Page 137, paragraph2, line 1 – I think the tables are incorrectly referenced. I think the short-term projects are in Tables 6-4 thru 6-6.	References corrected	Addressed

	Comment	Action	Status:
Iowa DOT 10/5	Good description on how alternative roadway and bike-ped projects were analyzed, scored and prioritized.	general comment-no edits	No edit
	Page 119 – Project 41 on the map: Without looking at a list, I would not be able to tell where the project is located or if it is a high, medium, or low scoring tier. Is it missing?	Project was removed-map updated with 41 removed	Addressed
	Page 120 – Some readers may not know what ON and OFF refers to here on this map. Please add more context for ON and OFF to the legend or as a footnote.	Clarification was added on page 115	Addressed
	Page 121 – Same here for CR. I agree with Gerri's comment.	Reference to tables added	Addressed
	Excellent discussion on emerging trends and technologies, especially the way it is conveyed on pages 123-124. It can be quite difficult to discuss these topics any less broadly when we do not confidently know if (some of) the technology will be making significant changes to the planning, project selection, etc. next week or in 10 years. The pros, cons, timeframe and impact are nice touches on this piece. I find myself wanting to know what the definitions are for the timeframe and impacts in relation to their scale. I am not suggesting you add them but my perception of near-term or significant is probably different than this plan. Providing a definition here would help me key into what you want to be telling me.	Definitions added	Addressed
	I am having some difficulty reading the text on Figure 6-6. Either making it darker or bigger would help me read it better.	Picture made larger	Addressed
	Perhaps I missed it, and if so, never mind. If not, please add a discussion of resource agency consultation with applicable Federal, State, and Tribal management, wildlife, and regulatory agencies such as the Iowa Department of Natural Resources, State Archeologist, County Conservation Boards, etc. It is important to have discussions with these folks on the types of potential activities that may have the greatest potential to restore and maintain the environmental functions affected by the regional transportation plan. So please add any examples/discussion about notifying agencies early on in the update or asking for their review and comment on draft sections could be added to either the environmental or MTP engagement section.	Will be added as appendix	Addressed
	Most of the road widening projects in the Forward 2045 Plan are unnecessary. Sizing roads for peak loads is financially unsustainable.		
	If vehicle drivers feel that their route during peak use is congested, the vehicle driver has the option to: 1) start their trip earlier; 2) start their trip later; 3) seek an alternate route; 4) seek an alternate mode; or 5) a combination of the previously mentioned.		

	Comment	Action	Status:
Public Comment 10/20	Adding lanes to a road is the equivalent of adding rooms to a house. In a home scenario, adding rooms will increase the yearly heating, cooling, and maintenance costs due to the additional cubic footage. This 2045 transportation plan does not factor in the financial sustainability of increased yearly costs associated with maintaining more cubic footage of vehicle pavement. Decreasing vehicle congestion is not accomplished by adding lanes. Decreasing vehicle congestion is accomplished by creating more favorable conditions for alternative transportation modes; it's about converting more vehicle trips to carpooling, transit, walking, and bicycling. The cost of constructing shared use paths is dirt cheap compared to road projects. Increased levels of walking and bicycling has health benefits. Decreasing vehicle congestion is not accomplished by adding lanes. Decreasing vehicle congestion is accomplished by creating more favorable conditions for alternative transportation modes; it's about converting more vehicle trips to carpooling, transit, walking, and bicycling. The cost of constructing shared use paths is dirt cheap compared to road projects. Increased levels of walking and bicycling has health benefits. On document page 179, the largest word in the word cloud for "What would you do to improve the Ames transportation system" is "sustainable". Adding car lanes is not sustainable for the environment or the city's finances.	Note: This is all one comment. Comment was documented in the public engagement appendix. As required, a performance-based planning process was used to identify projects for the constrained plan. The performance-based planning project was based of off Federal performance measures along with local performance measures developed from the goals & objectives.	Comment was documented in public engagement appendix
Ames Bicycle Coalition Comment 10/22	The Ames Bicycle Coalition appreciates the thorough approach to developing this plan. Our overriding vision for the plan is that it achieves transportation equity for cyclists, pedestrians, and transit. We prioritize increasing the ease and safety for getting around Ames by something other than personal motorized vehicles. We are seeing significant increases in alternate transportation in the form(s) of walking, bicycling, electric skateboards and scooters, and expect these trends to continue as younger generations face economically and socially destructive challenges caused by COVID, climate change, etc. To reiterate our priorities for transportation planning, financing and implementation: •Prioritize multi-modal transportation. •Require, incentivize, and reward accommodation of multi-modal transportation options such as bikes, pedestrians, buses, electric vehicles, and car-sharing. •Connect and expand bike and pedestrian trail and commuter networks. •Encourage Ames to limit further geographic sprawl. oSprawl often creates conditions -- such as proximity to high volume, high speed vehicle traffic; unsafe or poorly designed intersections; minimalist bike and walking facilities, and streetscapes empty of people and places – that discourage folks from healthy habits of riding and walking. oSprawl creates longer distances that increase the cost for services such as school buses, ambulances, city water services, and travel in general. •Ongoing project imple+A32:A33mentation should continue to prioritize evaluation and adaptions that increase safe and efficient travel for all modes.	Note: This is all on comment.	Comment was documented in public engagement appendix

	Comment	Action	Status:
Ames Climate Action Team Comment 10/22	Thank you for your efforts to develop a balanced, well-rounded 2045 Long Range Transportation Plan in Ames. Because the climate crisis urgently needs to be addressed at all levels of planning, we urge you to build medium and long-term solutions into transportation planning to reduce greenhouse gases and integrate climate adaptation solutions as much as possible, whenever possible. A few examples that we would like to emphasize support for include: •Prioritize multi-modal transportation. •Require, incentivize, and reward accommodation of multi-modal transportation options such as bikes, pedestrians, buses, electric vehicles, and car-sharing. •Connect and expand bike and pedestrian trail and commuter networks. •Encourage Ames to limit further geographic sprawl. Longer distances make cycling harder and less viable. Sprawl causes longer distances that increase the cost for services such as school buses, ambulances, city water services, and travel in general.	Note: This is all one comment.	Comment was documented in public engagement appendix