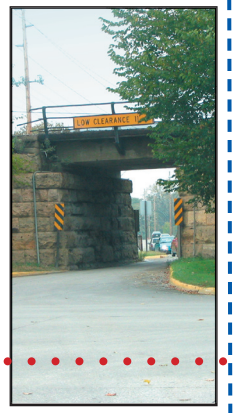
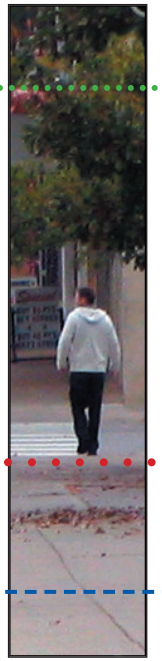
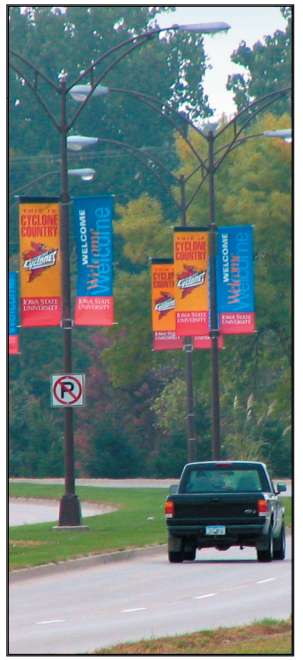
Executive Summary







HWS
Solutions Through Service

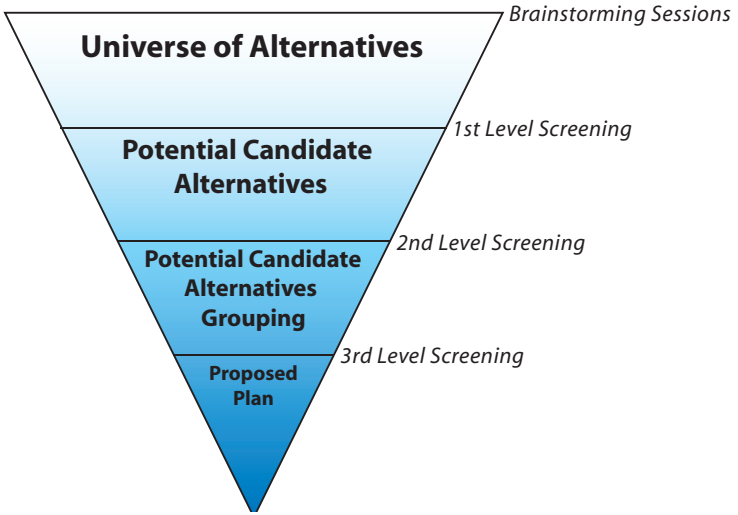
EXECUTIVE SUMMARY

The purpose of preparing the Ames Area MPO Long Range Transportation Plan (LRTP) was to have a document that embodied the community's vision for transportation consistent with the adopted Land Use Policy Plan (LUPP) for the metropolitan area. Each step of the process required input and oversight from agencies concerned with potential changes to the transportation system. Public involvement was also critical to the success of the plan and its ultimate adoption by elected officials.

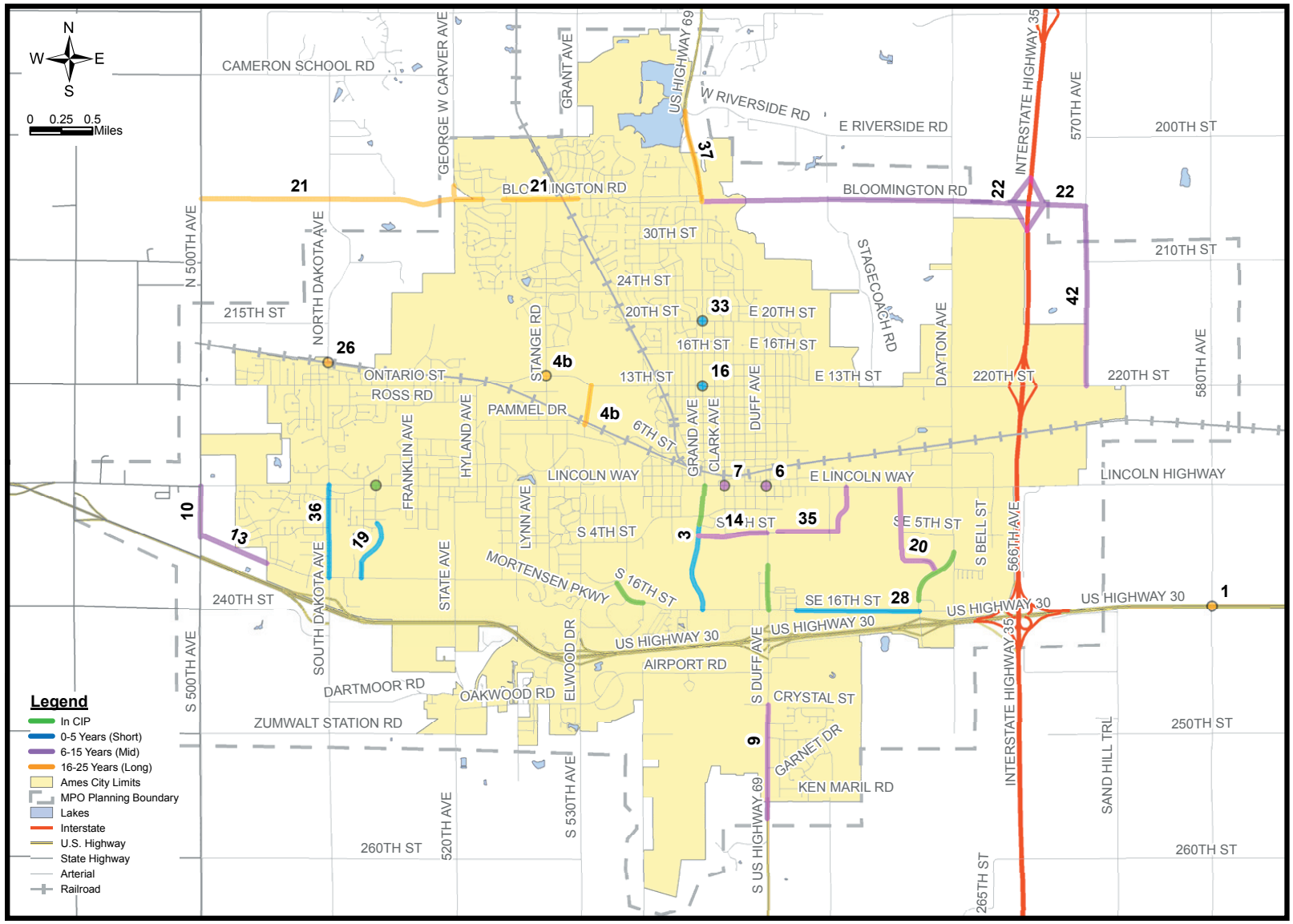
This transportation plan is unique because it is the first one prepared with Ames designated as a metropolitan area. The recently formed Ames Area Metropolitan Planning Organization (AAMPO) includes the City of Ames, Boone County, Story County, Iowa State University, CyRide, Federal Highway Administration, Federal Transit Administration, the Iowa Department of Transportation and other agencies and communities that are affected by planning decisions within the metropolitan area. As an MPO, the Ames area is entitled to new categories of funding for transportation improvements. The plan identifies transportation projects and services that would be funded through 2030.

Bandshell Park is an example of the many amenities in Ames that add to quality of life. This transportation plan respects these amenities and creates a balance between transportation needs and community values.

Four Step Planning Process



This study used a four step process to achieve the goal of finding the best improvement alternatives as defined by residents of the Ames Metropolitan Area. The process involves identifying the Universe of Alternatives and then examining each alternative using more and more detailed levels of analysis. Alternatives with lessor merit in terms of traffic carrying capability, environmental impacts and costs are eliminated in favor of those that appear to better achieve community goals. Alternatives that are eliminated are not necessarily inadequate or undesirable. They simply are deemed to be less worthy of further study than the ones that remain.



SHORT, MID AND LONG TERM ROADWAY IMPROVEMENT PLAN

Proposed Roadway Improvement Plan

1. U.S. 30 and 580th Avenue Grade Separation - A new interchange at the U.S. 30 and 580th Avenue intersection would be constructed.

3. Grand Ave Extension from S. 5th Street to S. 16th Street - This project involves an extension of Grand Avenue between South 5th Street and South 16th Street.

4b. Elwood Drive Extension from 6th Street to 13th Street/ 13th Street and Stange Road Intersection Improvement - This project proposes an extension of Elwood Drive between 6th Street and 13th Street. Additionally, this alternative involves the reconstruction of the 13th Street and Stange Road intersection to add an exclusive westbound right turn lane. The intersection would also receive new pavement markings.

5a. 13th Street and Stange Road Intersection Improvements - The intersection would be reconstructed to add left turn lanes to Stange Road.

6. Lincoln Way and Duff Avenue Intersection Improvements - The intersection would be reconstructed to add left turn lanes to Lincoln Way.

7. Lincoln Way and Clark Avenue/ S. Walnut Avenue Intersection Improvements - The intersection would be reconstructed adding left turn lanes to Lincoln Way.

9. South Duff Avenue Widening from Kitty Hawk Drive to Ken Maril Road - This alternative would widen the current two-lane South Duff Avenue from Kitty Hawk Drive to Ken Maril Road to a paved five-lane roadway.

10. County Line Road Reconstruction from Mortensen Road to West Lincoln Way - The two-lane gravel County Line Road from Mortensen Road to West Lincoln Way would be reconstructed to a two-lane paved road.

The underpass at Pammel St and Haber Rd currently allows only one direction of traffic through at a time. Project 4B (Elwood Drive Extension) would widen the underpass and reduce traffic on the ISU campus.

13. Mortensen Road Extension from Miller Avenue to County Line Road (with County Line Road Reconstruction described above) - This alternative proposes an extension of Mortensen Road between Miller Avenue and County Line Road.

14. South 5th Street Extension from Grand Avenue to South Duff Avenue - South 5th Street would be extended between Grand Avenue and South Duff Avenue.

16. 13th Street and Grand Avenue Intersection Improvements - The intersection would be reconstructed to add left turn lanes to both 13th Street and Grand Avenue.

19. Dotson Drive Extension from Aplin Road to Mortensen Road - This alternative proposes an extension of Dotson Drive between Aplin Road and Mortensen Road.

20. Freel Drive Reconstruction and Extension from Lincoln Way to Dayton Avenue - Freel Drive would be extended from SE 5th Street to the future SE 9th Street and Dayton Avenue intersection. Freel Drive from SE 5th Street to East Lincoln Way will be reconstructed as a paved two-lane section.

21. Bloomington Road Extension from G.W. Carver Avenue to County Line Road - This alternative involves extending

Bloomington Road between G.W. Carver Avenue and County Line Road. This project also involves widening the existing Bloomington Road to four lanes from just east of the UPRR to just west of G.W. Carver Avenue.

22. Bloomington Road Extension from Grand Avenue to 570th Avenue - The project entails the construction and reconstruction of a paved two-lane roadway. Intersections will be built at Stage Coach Road, Dayton Avenue and 570th Avenue. An interchange will be built at I-35. An Environmental Impact Study would be prepared with this project.

26. North Dakota Avenue and Union Pacific Railroad Crossing Grade Separation - A four-lane bridge over the U.P.R.R. on North Dakota Avenue would be constructed. North Dakota Avenue would be widened to four lanes on the approaches to the bridge.

28. SE 16th Street Reconstruction from South Duff Avenue to South Dayton Avenue - The two-lane SE 16th Street from Lark Avenue to South Dayton Avenue would be reconstructed from a gravel road to a paved road. The project would also improve the intersections along SE 16th Street at South Duff Avenue and Dayton Avenue.

33. 20th Street and Grand Avenue Intersection Improvements - The 20th Street and Grand Avenue intersection would be reconstructed to add left turn lanes to Grand Avenue.

35. SE 5th Street and Lincoln Way Connection - This alternative would extend SE 5th Street from South Duff Avenue to East Lincoln Way. The proposed roadway section would be three lanes.

36. South Dakota Avenue Widening from Lincoln Way to Mortensen Road - The current two-lane section on South Dakota Avenue from Mortensen Road to Lincoln Way would be widened to a five-lane section.

Most shared use paths require regular maintenance. Because of costs, snow removal is limited to those paths along major routes to work, shopping and commercial areas.

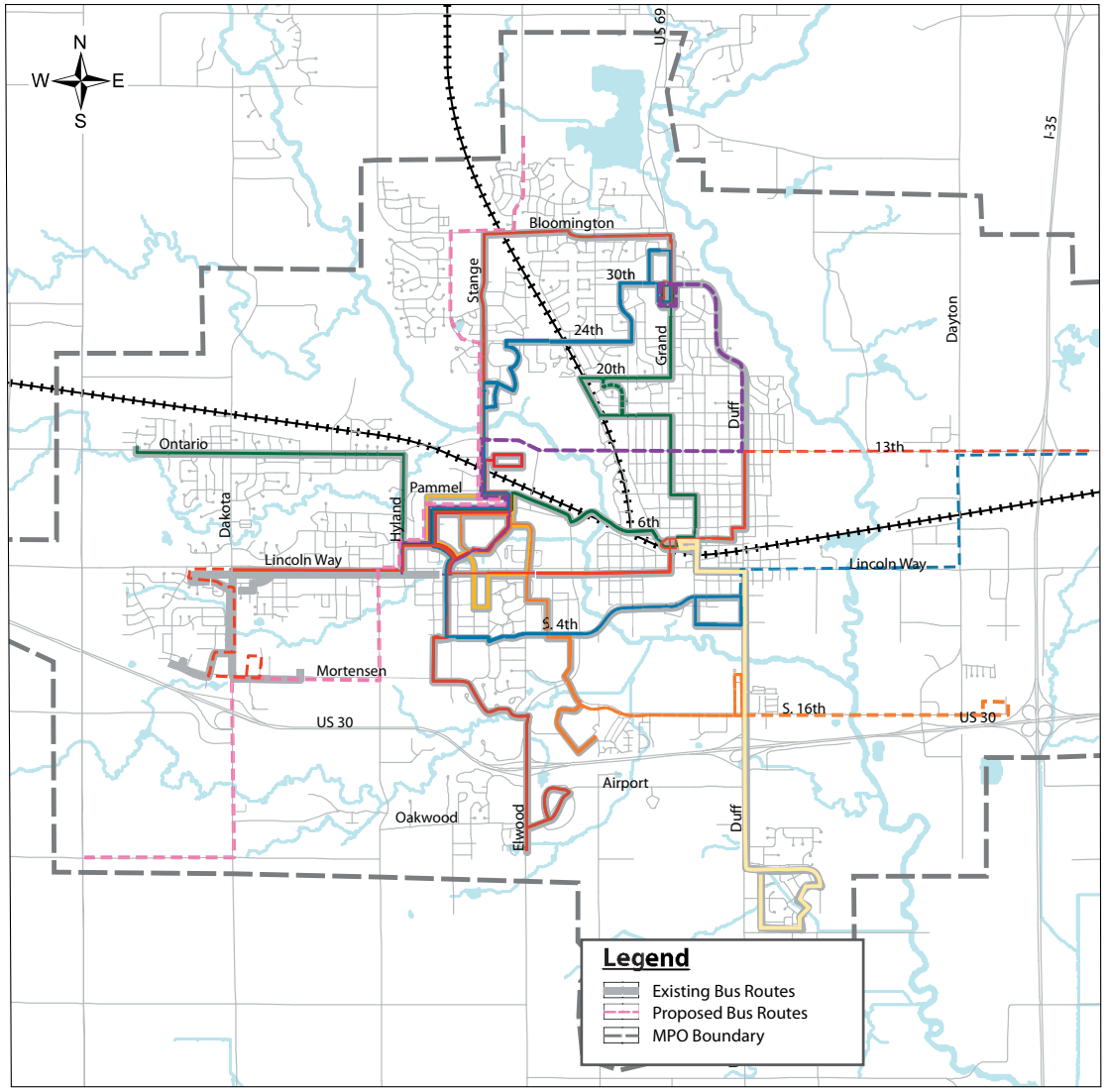
37. U.S. 69 Widening from Bloomington Road to Riverside Road - This alternative would widen the current two-lane U.S. 69 section from Bloomington Road to Riverside Road to a five-lane section.

42. 570th Avenue Reconstruction - 570th Avenue would be reconstructed as a two-lane paved section from 13th Street to the proposed Bloomington Road Extension project.

Proposed Transit Plan

Short Term Policies

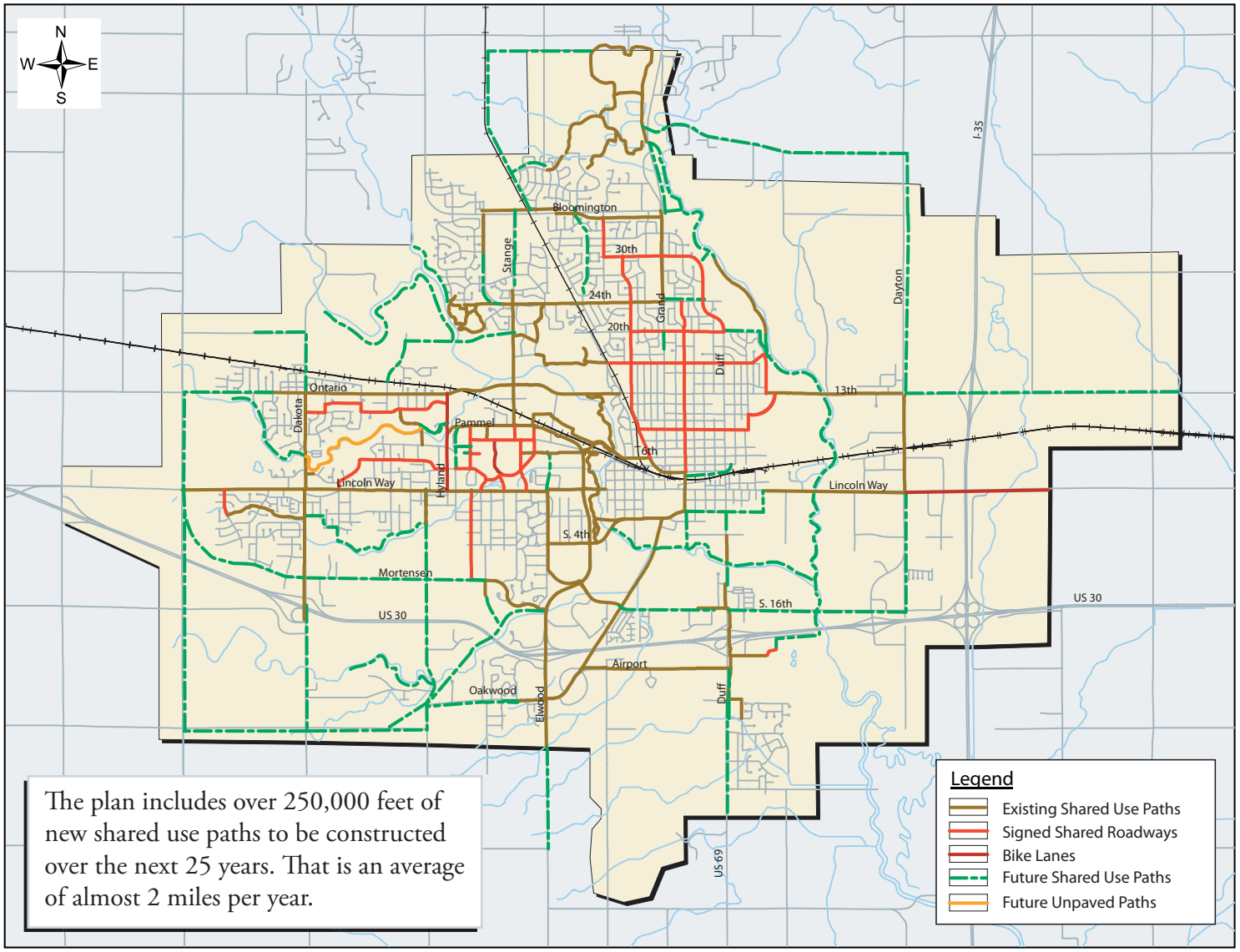
1. Extend the Blue route east along Lincoln Way and to the future East 13th Street commercial area.
2. Reroute the Red route east along East 13th Street from Duff Avenue to I-35.
3. Reroute the Purple route along the current Red route to North Grand Mall
4. Extend the Orange route east along South 16th Street.
5. Eliminate the Purple route and reroute the Red route west of the ISU campus.
6. Add a new Pink route, or existing route extensions, to serve neighborhoods on the city's northwest and southwest sides.



PROPOSED BUS ROUTES

Long Term Policies

- Add service to areas experiencing deficiencies, particularly those with transit-dependent populations, including concentrations of students, senior citizens, renters and low-income households.
- Ensure transit service within ¼ mile of low-density residential areas and 1/8 mile of medium- and high-density residential areas.
- Ensure that the design of new retail and employment centers provides access for buses and includes adequate pedestrian access to transit stops.
- Ensure minimal headways along heavily traveled routes, in-vehicle travel times of less than 30 minutes between major activity centers and that trips require no more than one transfer.
- Maintain a cost per revenue mile, cost per revenue hour, farebox recovery ratio and ridership level that is well above the average performance level of peer transit systems.
- Establish a goal that the majority of the routes do not fall below 60% of the system-wide average for each performance measure.



EXISTING AND PLANNED BICYCLE FACILITIES

Does the Plan Achieve the Community's Goals?

Goals, objectives and policies were identified at the beginning of the planning effort and became the framework for the entire process.

Goal	Goal Achieved?	Discussion
GOAL 1: Coordinate the various modes of transportation.	Yes	The plan incorporates pedestrian, bicycle and transit improvements with roadway projects.
GOAL 2: Provide efficient transportation service.	Yes	The plan is efficient with improved travel times, less delay and reduced congestion. All intersections and roadway segments are expected to operate at an acceptable level of service.
GOAL 3: Provide safe travel.	Yes	The plan should improve safety by reducing congestion and providing for more direct travel to work, shopping and recreation areas.
GOAL 4: Provide interconnection of non-motorized transportation facilities.	Yes	The plan provides greater access to the roadway system and transit facilities for bicyclists and pedestrians. Several miles of new mixed use trail facilities are proposed.
GOAL 5: Enhance economic development.	Yes	The plan improves several roadways providing convenient access to under utilized property within and outside the city limits.
GOAL 6: Minimize negative impacts.	Yes	The efficiency of the proposed roadway system will have a positive effect on the environment. Proposed new roadway alignments, transit routes and pedestrian facilities minimize need to acquire right-of-way and widen existing streets.
GOAL 7: Integrate with the Land Use Policy Plan.	Yes	The Land Use Policy Plan was used as the basis for all socio-economic data used in the planning process.
GOAL 8: Establish interagency coordination and cooperation.	Yes	The plan was put together under the supervision of the agencies that are members of the Ames Area MPO.
GOAL 9: Provide a financially feasible transportation plan.	Yes	The plan is fiscally constrained which means the projects listed can be constructed in the next 25 years with current funding levels.
GOAL 10: Commitment to implement the improvements according to a schedule.	Yes	The plan provides a schedule of short, mid and long term projects. Approval of the plan by the MPO Policy Board reflects the commitment of member agencies to maintain this schedule.

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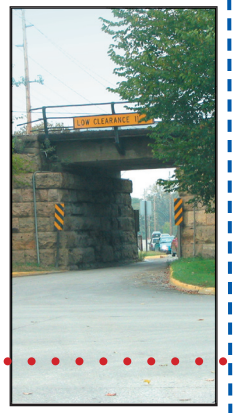
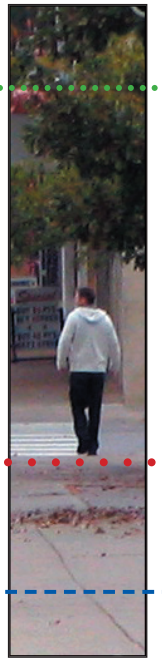
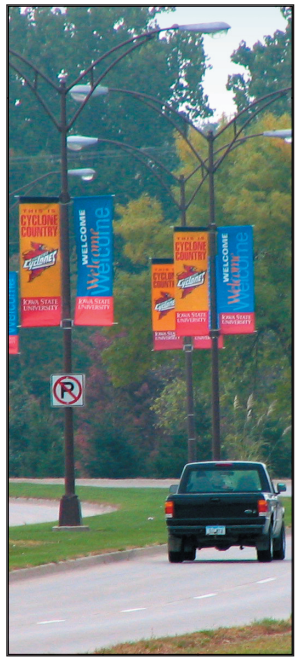






HWS

Solutions Through Service

INTRODUCTION

What is a Metropolitan Planning Organization and what has changed since the Ames Area became one?

A Metropolitan Planning Organization (MPO) is an entity identified by the federal government for communities that have reached a population of 50,000 or greater. It provides a way to coordinate federal funds for projects such as transportation improvements and environmental cleanup efforts for communities with multiple jurisdictions and agencies. Being an MPO provides Ames and surrounding communities with an opportunity to qualify for more federal funding options for these types of improvements. It also requires the communities within the MPO to cooperate and coordinate their efforts to a greater degree than they have in the past.

The purpose of preparing the Ames Area Metropolitan Planning Organization (AAMPO) Long Range Transportation Plan (LRTP) was to have a document that embodied the community's vision for transportation consistent with the adopted Land Use Policy Plan (LUPP) for the metropolitan area. Each step of the process required input and oversight from agencies concerned with potential changes to the transportation system. Involvement by the public was also critical to the success of the plan and its ultimate adoption by elected officials.

This transportation plan is unique because it is the first one prepared with Ames being designated a metropolitan area. The recently formed AAMPO includes the City of Ames, Boone County, Story County, Iowa State University, CyRide, Federal Highway Administration, Federal Transit Administration, the Iowa Department of Transportation and other agencies and communities that are affected by planning decisions within the metropolitan area. As an MPO, the Ames area is entitled to new categories of funding for transportation improvements. It is also responsible for more communication and coordination among the organizations that make up the MPO.

The City of Ames has engaged in transportation planning in the past, with the first plan completed in 1967 and a subsequent plan completed in 1985. The most recent transportation plan was approved in 2000 and included the development of a travel demand model to use as a tool for identifying future deficiencies and determining the potential outcomes of various transportation improvements under consideration. With the recent designation of Ames as a MPO, the City of Ames is faced with the need to update the 2000 plan to identify transportation projects and services that would be funded through the year 2030.

1.1 Study Area

The LRTP study area is delineated by the AAMPO boundary, which includes the Ames incorporated city limits plus the planning jurisdiction outside of the incorporated areas. Figure 1.1 illustrates the study area.

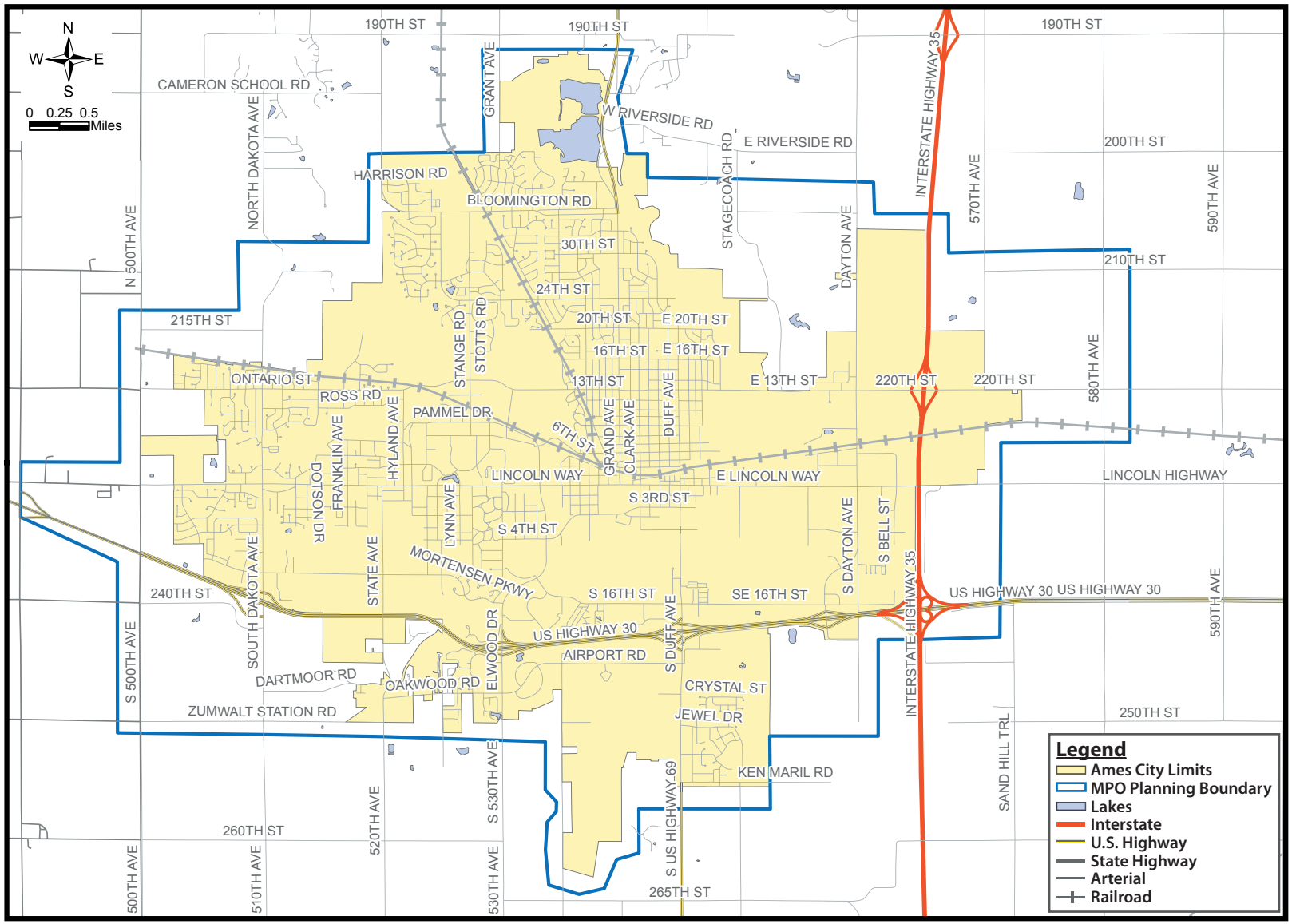


FIGURE 1.1 - STUDY AREA

1.2 Methodology

The following modes of transportation were addressed in the Ames Area MPO LRTP:

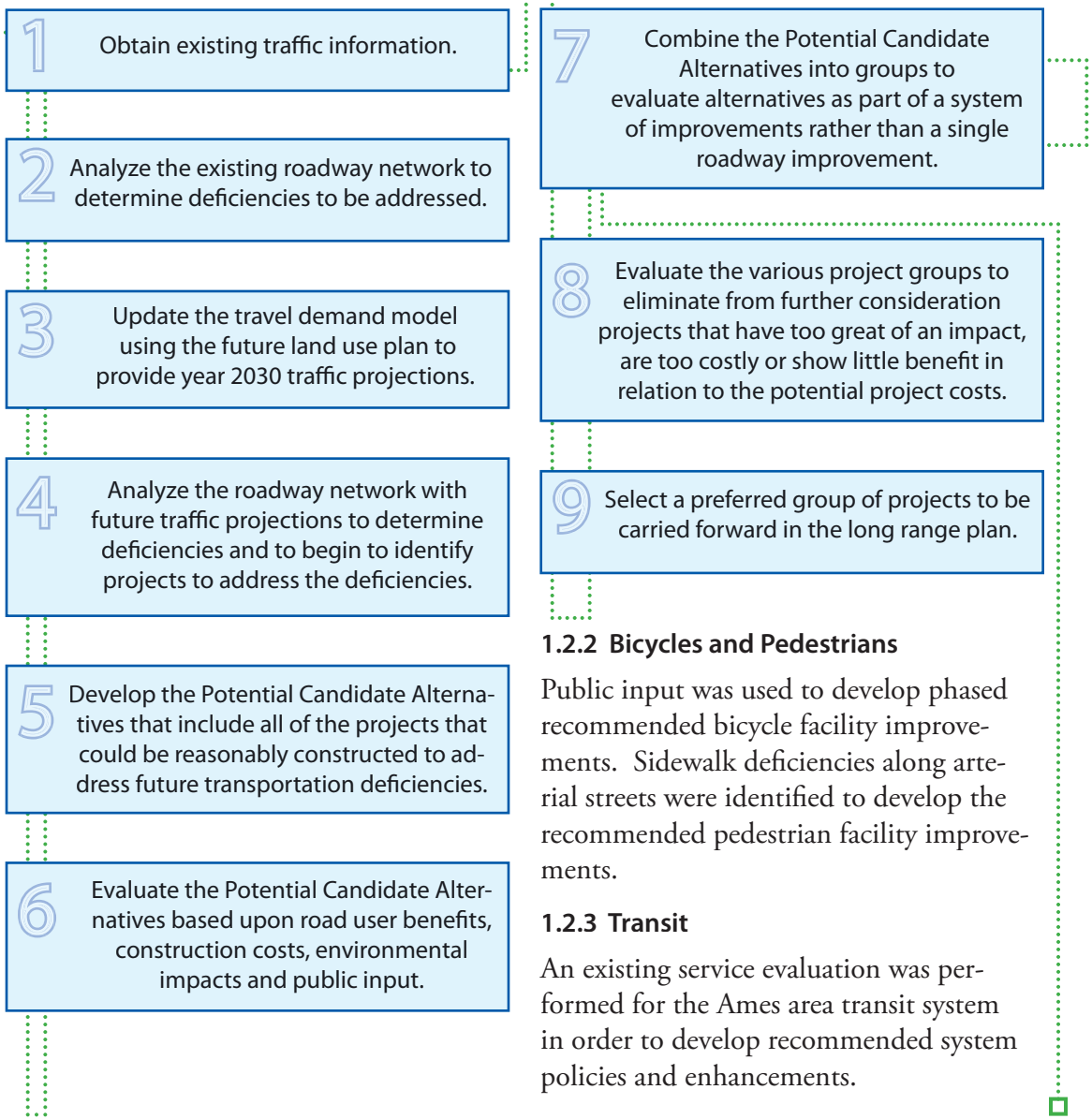
- Roadways
- Bicycles and Pedestrians
- Transit
- Other Modal Systems

The methodology for including these elements is described in the chart.

1.2.1 Roadways

The study used a "performance based" planning approach to examine the roadway system and arrive at the most cost-effective method to accommodate future vehicular traffic demand. The flow chart to the right summarizes each step of the process:

This methodology allows for flexibility in determining the alternatives to be studied as well as grouping them in ways to determine how one project influences another. The entire process was done with the help of the public through meetings, correspondence and other outreach programs.



1.2.2 Bicycles and Pedestrians

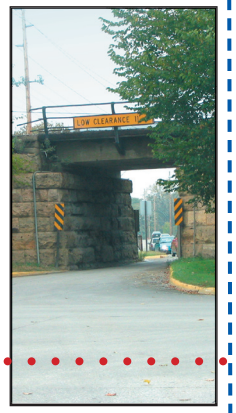
Public input was used to develop phased recommended bicycle facility improvements. Sidewalk deficiencies along arterial streets were identified to develop the recommended pedestrian facility improvements.

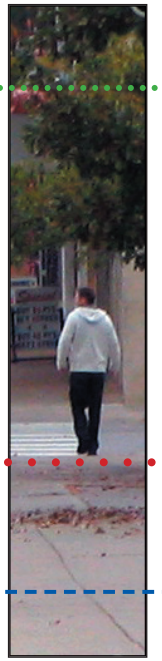
1.2.3 Transit

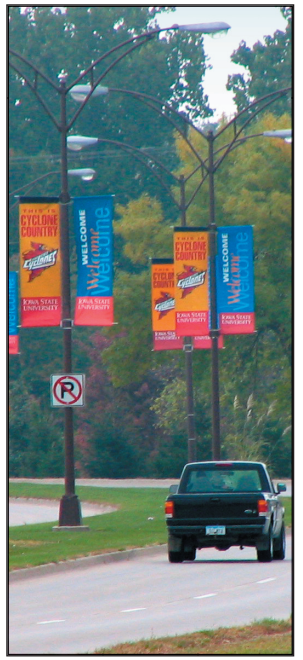
An existing service evaluation was performed for the Ames area transit system in order to develop recommended system policies and enhancements.

Goals and Objectives

Section 2







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Solutions Through Service

This section of the report describes the goals identified for the Ames Area MPO LRTP.

Objectives describe specific outcomes that satisfy the intent of the goals. They may be thought of as more detailed descriptions of the goals. Preferably, objectives should be quantifiable in order to determine if the objective has been met and what progress has been made toward achieving the goals.

Policies are statements designed to identify when an objective has been met. For example, if an objective is to reduce air pollution, the policy may be to reduce carbon monoxide concentrations to a level below the National Ambient Air Quality standard.

The following are the goals, objectives, and policies for the Ames Area MPO LRTP.

The Transportation System

GOAL 1: Mobility - Coordinate the various modes of transportation to provide convenient travel for all system users.

Objectives

a. Enhance the coordination of the automobile, public transit, bicycle, air travel and pedestrian facilities and services.
b. Provide desirable linkages between the existing transportation system and new developments, redevelopment or other significant changes in land use.
c. Evaluate the potential for additional transportation service from Ames to surrounding cities.

GOAL 2: Transportation Performance - Provide efficient transportation service with needed capacity, convenience, health, and safety for all users.

Objectives

a. Achieve appropriate performance levels for peak-period demand.
b. Reduce the delay and crash potential at highway/rail crossings.
c. Improve regional access and travel times for emergency response.
d. Expand and/or improve vehicular access to regional highways such as I-35 and U.S. Highway 30.
e. Improve access management for the roadway system.
f. Expand the role of transportation modes other than the auto for trips.
g. Provide transportation options including public transportation service that is accessible to residential areas and to primary trip attraction areas at a reasonable cost.
h. Achieve reasonable travel times for intraregional trips by all modes.
i. Preserve and maintain the existing transportation facilities including pavement, signage, striping, signal systems and other transportation infrastructure.
j. Incorporate intelligent transportation systems (ITS) in order to address and alleviate transportation congestion and to provide real time information to motorists.

Policies

- Provide peak hour Level of Service C or better for all streets.
- Identify the need for improvement of highway/rail crossings.
- Make possible average travel times 15 minutes or less for travel by automobile and 30 minutes or less for travel by transit.
- New or improved streets should conform to local and/or Iowa DOT design standards.
- The street system should be planned to provide alternate linkages to areas that could be impacted by flood emergencies.
- The street system should balance the needs for efficient traffic flow and property access through appropriate intersection spacing, driveway spacing and left-turn restriction consideration.
- The majority of CyRide service should be planned considering a maximum one-quarter mile walking distance to bus routes.
- A functional classification map should be adopted for the metropolitan area. The integrity of the roadway's classification should be maintained through proper continuity and spacing.
- Ninety-five percent (95%) of CyRide service should allow trips to be made with no more than one transfer.
- Arterial streets should have a bicycle facility or the next parallel street should be appropriate for biking.

GOAL 3: Safety - Provide safe travel for all modes of transportation.

Objectives

a. Reduce traffic crashes.
b. Support safety education and training programs.
c. Plan, design and maintain transportation facilities keeping safety in mind.
d. Increase the percentage of trips accomplished by bicycle or pedestrian modes.

Policies

- Collect and maintain crash data in order to identify high crash locations, determine probable causes and provide alternatives to resolve the safety problems on a continual basis.
- Identify safety candidate locations by using the Iowa DOT's "Safety Improvement Candidate (SICL) Methods".

GOAL 4: Non-Motorized Travel - Provide a system of interconnected and shared-use paths, sidewalks and recreational trails.

Objectives

a. Develop one bicycle system that acknowledges the presence of different user groups.
b. Link land uses with the bikeway and pedestrian system such that these modes can be used as a convenient and efficient mode of travel, as well as an attractive recreational opportunity.
c. Link the Ames bikeway system to the county/state bikeway system, including the Heart of Iowa Trail.
d. Extend the bikeway and pedestrian system to be integrated with new development.

e. The bikeway system should be a significant part of the transportation system.
f. The bikeway system should be free of pavement hazards and other obstructions.

Policies

- The design and integration of bike, pedestrian and other non-automotive facilities should creatively meet the overall purpose of the transportation plan while meeting AASHTO design standards.
- Sidewalks should be in accordance with the City's adopted standards.
- Those shared-use paths that will have winter maintenance shall be designated by the responsible agency.

GOAL 5: Support and enhance economic development within the region.

Objectives

a. Provide access to major commercial zones to enhance economic conditions for the primary regional markets.
b. Provide direct and efficient roadway access from the Ames industrial and commercial development corridors to I-35 and U.S. 30.
c. Create a pattern of improved accessibility for the high priority residential growth areas of Ames.
d. Provide efficient access to entertainment, cultural and recreational land uses in the Ames region, including special events.
e. Provide roadway and other modal access to industrial/commercial developments to enhance goods movement.

Policies

- Match the level of accessibility with the trade area associated with the land use.
- The priority of transportation improvements should be consistent with the development priorities defined by the Land Use Policy.

GOAL 6: Environmental and Natural Resource Protection - Recognize the environmental resources of the region and minimize negative impacts on such areas.

Objectives

a. Minimize transportation system encroachments into undisturbed areas of significant natural resources.
b. Minimize significant encroachment by non-local traffic within residential areas.
c. Promote long-term improvements in air quality, use energy efficiently, minimize noise and vibration levels and provide visually pleasing facilities.

Policies

- Where needed transportation improvements have the potential for environmental encroachment, appropriate mitigation will be considered.
- Non-motorized travel modes should be encouraged to promote desirable air quality and energy conservation.
- Consider traffic calming measures if the 85th percentile speed of motor vehicle traffic exceeds the speed limit by 10 mph.

The Planning Process

GOAL 7: Integration with Land Use Policy Plan – Integrate the Transportation Plan with the adopted Land Use Policy Plan.

Objectives

a. Link the transportation system with the desired development pattern of the overall community.
b. Establish new transportation corridors that have been planned, in part, to minimize impacts on significant natural resources.
c. Increase the efficiency of existing traffic movement in reducing air pollutants from automobiles.
d. Through a linkage with the LUPP, seek a development pattern that protects the airport and supports the airport's activities.
e. Seek land use compatibility with the transportation network.

GOAL 8: Interagency Coordination - Establish a spirit of commitment to interagency coordination and cooperation in the region.

Objectives

a. Provide transportation services that achieve equity in benefits and costs among the agencies in the region.
b. Match functional hierarchy with the appropriate jurisdiction so that the functions of the system's individual elements are balanced with level of responsibility.
c. Enhance intergovernmental relationships for coordination and cooperation and to provide the means for improving multimodal transportation.

GOAL 9: Financial Feasibility - Provide a financially feasible transportation plan.

Objectives

a. Cost-effectiveness, initial capital cost and life cycle costs should be considered in selecting projects for implementation.
b. Define a feasible financing strategy for the transportation master plan.
c. Leverage the use of non-local resources to increase the amount and/or effectiveness of federal and state resources available to the region.
d. Increase the use of private sector financial resources for transportation improvements based on the impacts generated by the private developments.

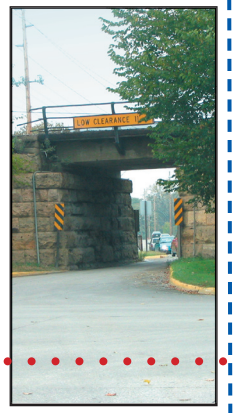
GOAL 10: Commitment to Implementation - Commit to implement the recommended improvements according to an identified schedule.

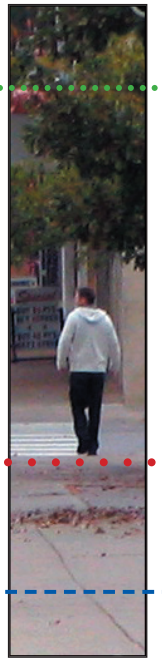
Objectives

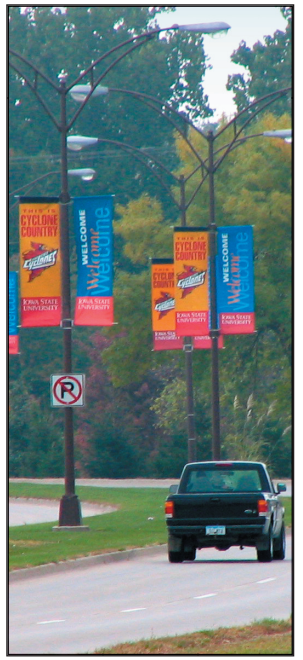
a. Provide a system for transportation plan implementation.
b. Define specific milestones for implementation.

Public Participation Program

Section 3







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Solutions Through Service

Transportation improvements represent a significant public investment. These projects affect many people who live in the community and/or have property near areas where improvements are constructed. Therefore, every reasonable attempt was made to provide the public with the opportunity to participate in the identification and development of alternatives. The Ames Area MPO LRTP included the public involvement elements described below.

3.1 Community Needs Assessment Survey

One of the first public participation elements of the Ames Area MPO LRTP was to conduct a Community Needs Assessment Survey. The purpose of the survey was to gather information and opinions from a random sample of residents regarding future transportation needs and issues.

ETC Institute designed and conducted a survey instrument to gather 800 completed surveys during September 2004. It should be noted that AAMPO was involved in the design of the survey. The "Regional Transportation Survey Findings Report" was completed in October 2004 and should be referred to for more detailed survey information. A summary of the report is included below. The major findings of the resident survey are as follows:

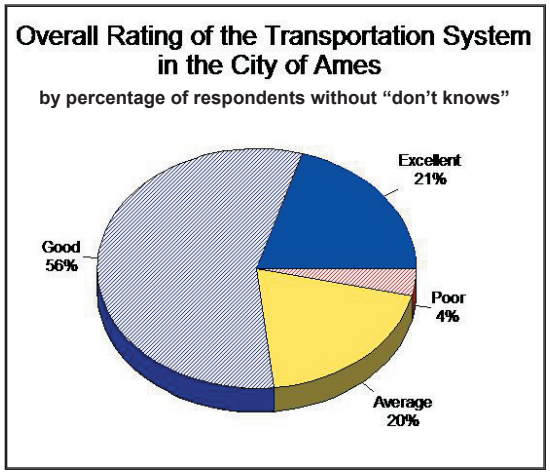
- **Satisfaction with the transportation system in Ames.**
  - **Highest rated aspects of the transportation system.** Based upon the combined percentage of "very satisfied" and "satisfied" responses, residents were most satisfied with the ease of traveling from Ames to other Iowa cities (85 percent), the ease of traveling from home to City parks (81 percent) and the flow of traffic at non-peak times (81 percent).
  - **Lowest rated aspects of the transportation system.** Residents were least satisfied with the flow of traffic on area streets during peak times of the day (36 percent), availability of bicycle lanes (46 percent) and traffic signal operations (48 percent).
- **Top priorities for transportation system improvements.** The three major areas that residents thought should receive the most emphasis from the City were flow of traffic on area streets during peak times of the day, traffic signal operations and ease of north/south travel in Ames.

ETC Institute discussed the survey results at the first public meeting.

- **Overall rating of the transportation system.** Over three-quarters (77 percent) of the respondents rated the transportation system in Ames as "excellent" or "good", 20 percent rated the transportation system as "average" and 4 percent rated the system as "poor".
- **Availability of public transit.** Eighty-eight percent of the respondents rated the availability of public transit in Ames as "excellent" or "good", 10 percent rated the availability as "average" and 2 percent rated the availability as "poor".
- **Reasons residents do no use public transportation more frequently.** The most cited reasons that residents do not use public transportation more frequent-

ly were that they prefer to drive and it takes too long compared to travel by car.

- **Support for increased funding of public transit.** Forty-two percent of the respondents were either "very supportive" or "somewhat supportive" of increasing funding to improve the current bus system in Ames. Thirty-two percent of the respondents were "not supportive" of increasing funding and 26 percent did not have an opinion.
- **Use of bikes.** Nearly one-half (48 percent) of the respondents had ridden a bicycle on a public street during the past year. Of these bicycle riders, 90 percent had ridden on a bike path during the last year.
- **Safety when riding bicycles.** Of those who had ridden a bicycle on a public street during the past year, 28 percent indicated that they did not feel safe bicycling on bike paths in the area where they live, 54 percent felt safe, 17 percent felt very safe and one percent did not have an opinion.
- **Intersections that residents thought should be top priority for improvement.** The two intersections residents identified as the top priority for improvement over the next five years were Lincoln Way and Duff Avenue and Grand Avenue and 13th Street.
- **Support for system enhancements.** Based upon the combined percentage of "very supportive" and "somewhat supportive" responses, residents were most supportive of adding turn lanes at critical intersections (91 percent), widening existing roads and building new roads to relieve congestion (71 percent) and having dedicated lanes for bikes on some city streets in Ames (70 percent).
- **Dependence on public transit or rides from others.** Nearly one in every five households (19 percent) responding to the survey had at least one person that is dependent on public transit or rides from friends/relatives because they do not drive. Eighty-one percent of the households had no one living in them that are dependent on public transit or others for transportation.



This is one of many charts that ETC Institute displayed at the first public meeting to illustrate the results of the surveys.

3.2 Technical Committee

A Technical Committee was formed for the Ames Area MPO LRTP to provide technical direction, review and comment on technical issues, develop solutions and make project decisions. This committee had major decision power. The Technical Committee was made up of members of various agencies, including the City of Ames, Story County, Iowa Department of Transportation, Iowa State University, CyRide, Boone County, Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA).

3.3 Citizen Advisory Committee

A Citizen Advisory Committee was also formed for the Ames Area MPO LRTP. The purpose of the committee was to provide feedback on and react to project decisions, to act as a sounding board for project ideas and to voice priorities and opinions

to the Technical Committee. The Citizen Advisory Committee was comprised of an appropriate cross section of the general population of Ames. The three committee meetings coincided with the three public meetings. This committee did not hold decision-making power but was integral in gathering feedback at key milestones throughout the project.

3.4 Public Meetings

Three public meetings were held to keep the public informed on the project's progress. Each meeting was held at key milestones and decision points. The public meetings were informal and provided time for viewing exhibits, meeting with the study team and asking questions.

Members of the study team discussed traffic issues with concerned citizens.

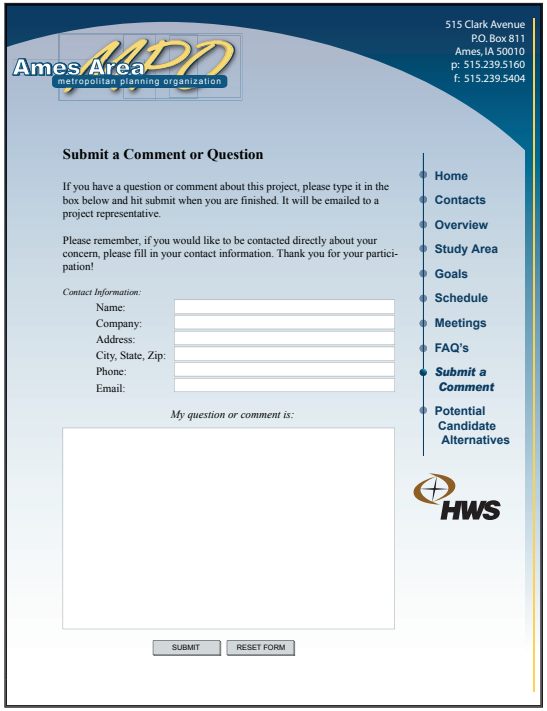
The public meetings are described as follows:

- **1st Public Meeting – February 16, 2005**
  Presented the Community Needs Assessment Survey, discussed issues and developed the Potential Candidate Alternatives.
- **2nd Public Meeting – May 19, 2005**
  Presented, evaluated and discussed the Potential Candidate Alternatives.
- **3rd Public Meeting – August 4, 2005**
  Presented the Potential Candidate Alternative groups and finalized project recommendations to obtain a preferred alternative for the plan.

3.5 Project Website

A project website was developed to inform the public of the project progress that can be accessed when it is convenient for them. The website address is www.hws.com/aampo. The site contains the following information:

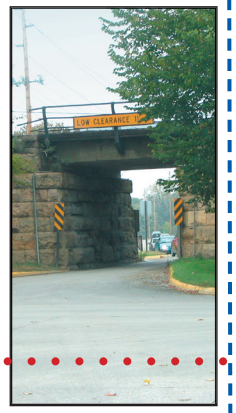
- Contact information
- Project overview
- Study area map
- LRTP goals
- Public meeting schedule
- Public meeting information, including handouts and presentations
- Frequently asked questions
- Comment or question form
- Potential Candidate Alternatives map

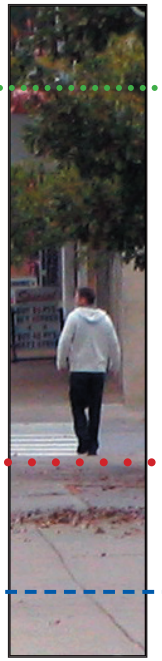


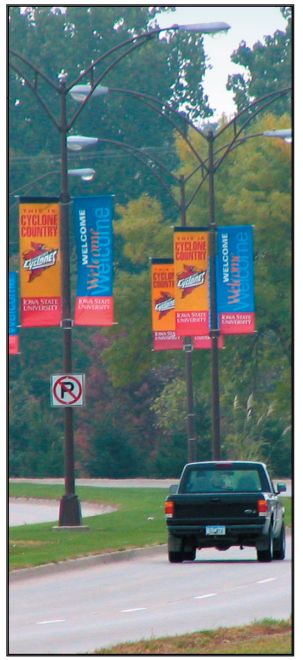
The AAMPO website had over 1,700 hits in nine months. The website allowed the public to submit their comments or questions online to the study team.

Land Use

Section 4







HWS

Solutions Through Service

LAND USE

As stated in the Introduction section of this report, the purpose of preparing an update to the Ames Area MPO LRTP was to have a document that embodied the community's vision for transportation consistent with the adopted Land Use Policy Plan (LUPP) for the metropolitan area. This section of the report discusses the study area's existing and future land use. It was developed using various documents obtained from the City of Ames Department of Planning and Housing.

4.1 Population Trends

The City of Ames has been experiencing a 0.75 percent annual population growth. According to the U.S. Census Bureau, the City's Population was 47,198 in 1990, 48,691 in 1995 and 50,731 in 2000.

4.2 Population Projections

Population within the City of Ames Planning Area is projected to grow from approximately 50,000 in 1990 to between 65,000 and 67,000 by the year 2030, as shown in Table 4.1. The population increase is 15,000 to 17,000 or 30 to 34 percent. The annual rate of growth is 0.7% - 0.8%. This is comparable to the trend experienced in the 1990's.

	Population Projections	
Year	Low	High
1990	50,000	50,200
1995	51,850	52,300
2000	53,750	54,400
2005	55,700	56,500
2010	57,600	58,600
2015	59,500	60,800
2020	61,400	62,900
2030	65,000	67,000

TABLE 4.1 -
CITY OF AMES PLANNING AREA POPULATION PROJECTIONS – 1990 TO 2030

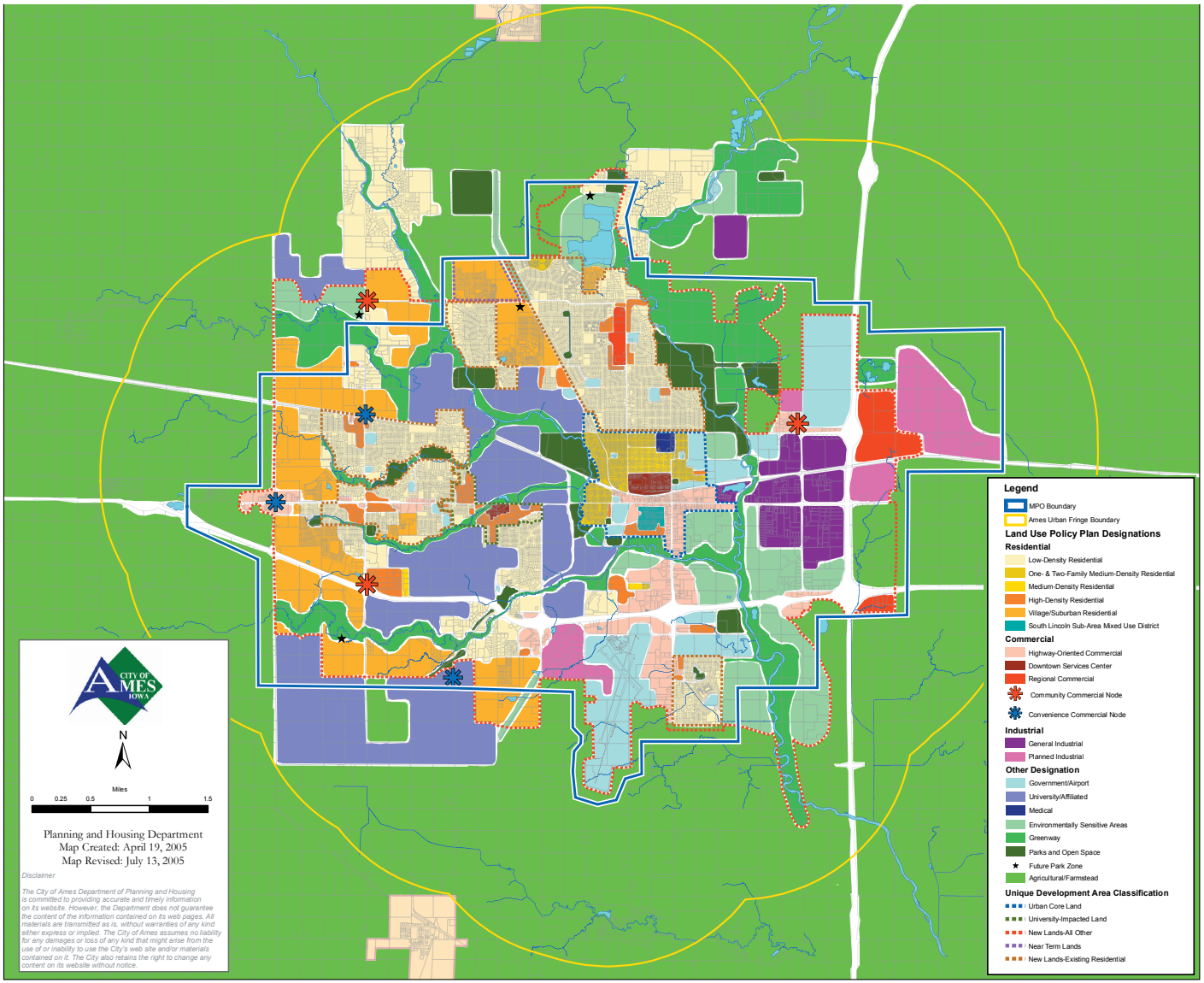


FIGURE 4.1 - LAND USE POLICY PLAN MAP

4.3 Existing Land Use

Figure 4.1 on the previous page illustrates the various areas available to accommodate projected land use according to the current land use policy.

4.4 Future Land Use

The City of Ames Planning Area land use projections are shown in Table 4.2 below.

	Area (acres)		
		2030	
Land Use Type	1994	Low	High
Residential	9,103	10,800	11,150
Commercial	732	1,530	1,630
Industrial	852	1,150	1,230
Public	5,489	5,620	5,670
Parks/Open Space	1,851	2,250	2,300
Other	36,081	32,785	32,128
Total	54,108	54,135	54,108

TABLE 4.2 - CITY OF AMES PLANNING AREA LAND USE PROJECTIONS

Figure 4.2 on the following page illustrates a likely pattern of development of the projected land area within the designated expansion areas.

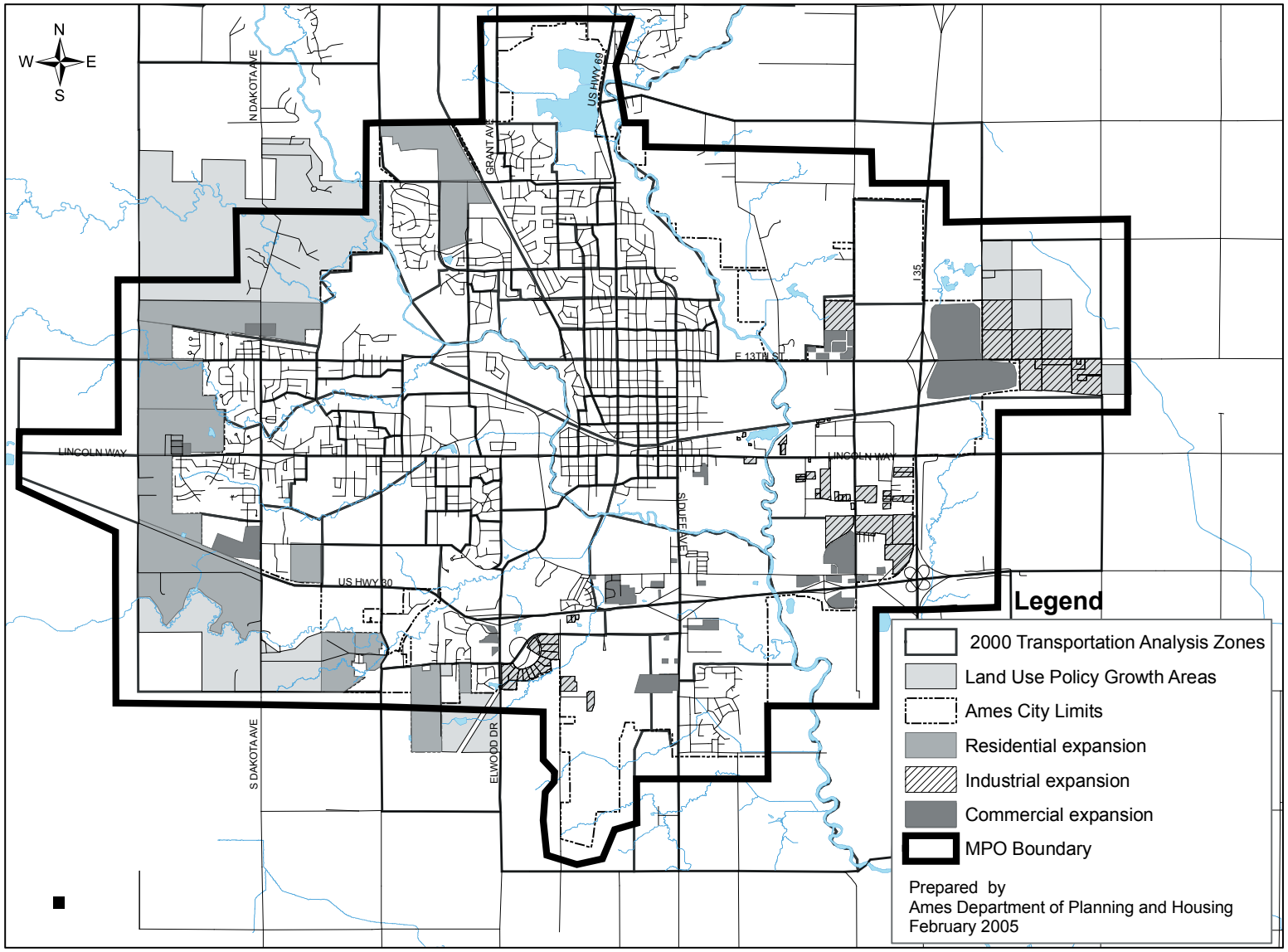
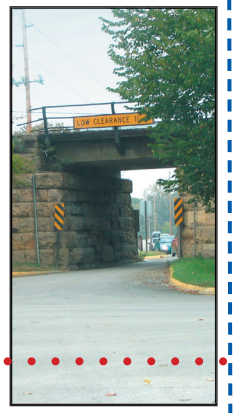
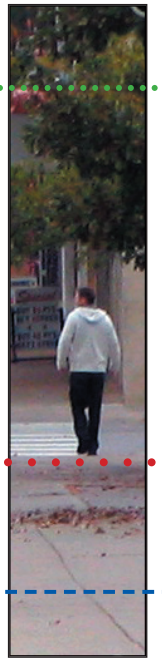


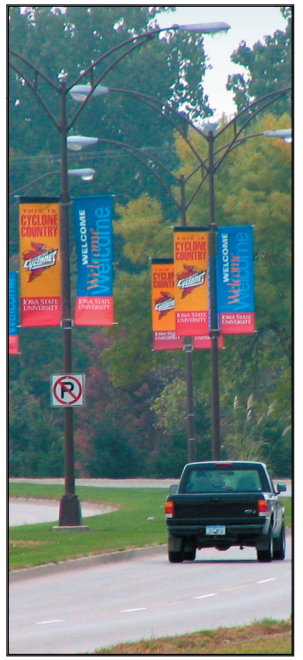
FIGURE 4.2 - PROJECTED EXPANSION AREAS THROUGH 2030

Roadways

Section 5







Solutions Through Service

5.1 Preliminary Roadway Issues

Elwood Drive provides access to Jack Trice Stadium, Hilton Coliseum, Stephens Auditorium and the Scheman Building. ITS technologies such as dynamic message signs, reversible lanes and traffic responsive signal control may help reduce delays.

Public opinion surveys conducted as part of this study indicate over 70% of Ames residents rate the transportation services as good or excellent. However, discussions with various agency representatives, civic groups and the general public revealed a number of roadway issues that should be addressed as part of this study. The issues fell into the following categories:

- **Better roadway connectivity.**
  Ames is bisected by railroad tracks, Skunk River and Squaw Creek. Only 13th Street, Lincoln Way, U.S. 30, I-35 and Dakota Avenue are continuous across the MPO boundary.
- **Congested Intersections.**
  Portions of Lincoln Way, Duff Avenue and Grand Avenue are congested during the morning and evening peak periods.
- **Safety.**
  A number of locations were investigated to determine whether the improvements would reduce crash rates.
- **Poor access to under utilized property.**
  There are several opportunities to better serve undeveloped property.

More specific issues are illustrated on Figure 5.1 and discussed on page 5.3.

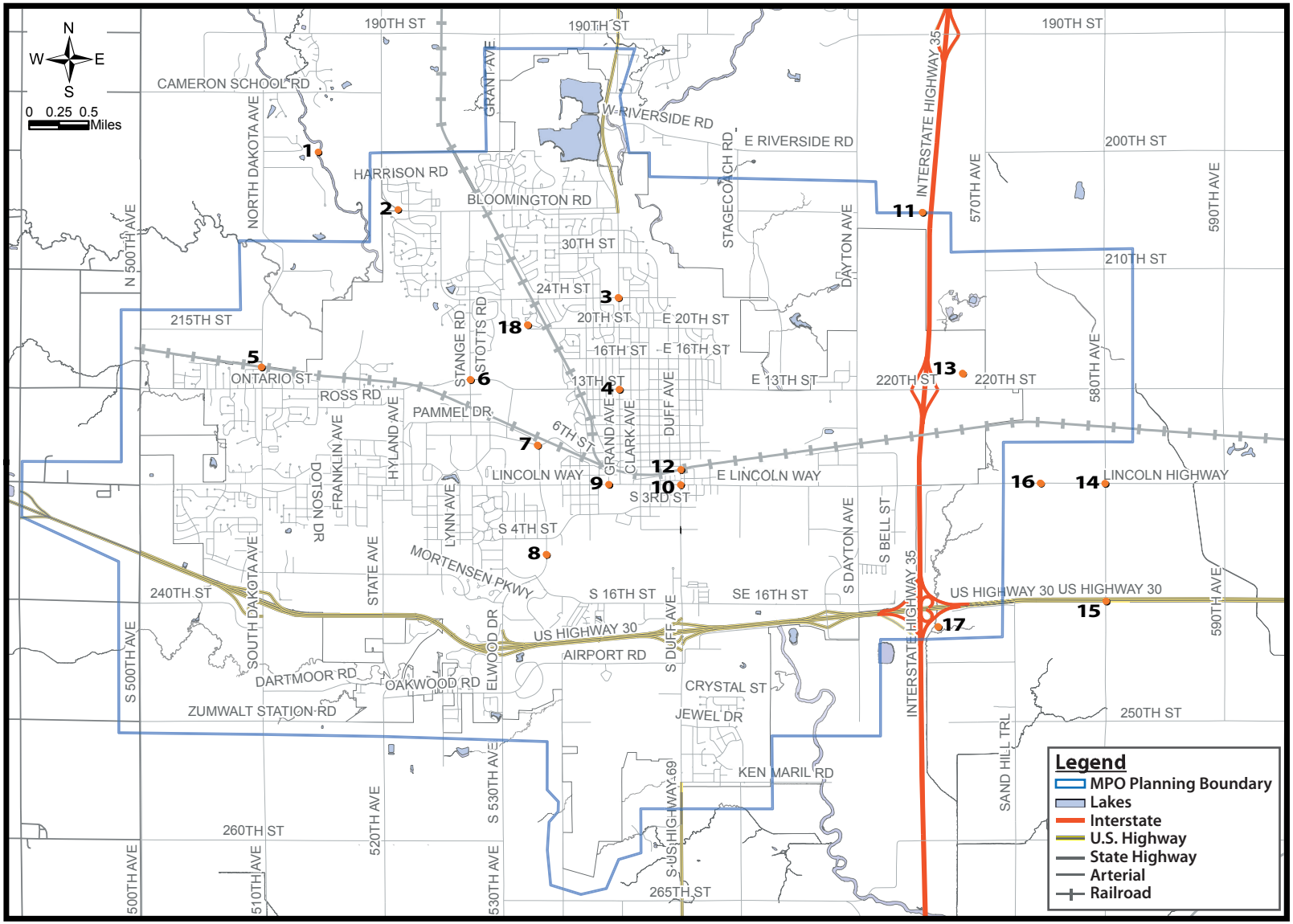


FIGURE 5.1 - PRELIMINARY ROADWAY ISSUES

Preliminary Roadway Issues *(refer to Figure 5.1)*

1. The Squaw Creek and Skunk River Flood Plain limits development opportunities and acts as a barrier to continuous roadways.
2. Possible extension of Bloomington Road to North Dakota Avenue.
3. 24th Street may require improvements at Grand Avenue.
4. 13th Street may require improvements at Grand Avenue.
5. UPRR is a barrier to roadway connectivity.
6. Stange Road and 13th Street intersection may need modifications.
7. Elwood Drive extension to 13th Street would take through traffic out of ISU campus.
8. Sports complex could benefit from dynamic message signs, possible reversible lanes and other ITS technology.
9. Extension of Grand Avenue would reduce traffic on Duff Avenue.
10. Lincoln Way and Duff Avenue expected to operate at poor level of service in the future.
11. Possible extension of Bloomington Road with interchange at I-35.
12. Duff Avenue and UPRR crossing is one of the most hazardous in Iowa.
13. Potential regional shopping center may affect interchange operation.
14. Lincoln Way and 580th Avenue may require channelization and signalization in the future.
15. 580th Avenue at U.S. 30 may need to be grade separation in the future.
16. East Lincoln Way may need to be widened to 4-lanes.
17. I-35 and U.S. 30 interchange may require improvements to accommodate future traffic increases.
18. Hayes Avenue between 24th and 20th Streets is congested with Ames High traffic before and after school.

5.2 Travel Demand Model Background

The Travel Demand Model (TDM) is a tool used by the MPO to assist in determining the effects of various land use and transportation improvement scenarios. The TDM is essentially a computer-based simulation of the region's transportation system and socio-economic characteristics. It was updated as part of this planning effort to include socio-economic data from the 2000 census and forecasted socio-economic data for the year 2030.

5.2.1 Transportation Analysis Zones

Transportation analysis zones (TAZ) are the base geographical unit of analysis for the Ames Area MPO travel demand model. A TAZ generally has its boundaries defined by adjacent:

- Functionally classified streets;
- Homogenous land uses;
- Railroad facilities; and/or
- Natural barriers to access, such as rivers.

The TAZ structure was updated in support of this long-range plan. The Ames Area MPO model now has 130 zones and 13 external stations. The TAZ structure is illustrated in Figure 5.2.

The MPO staff updated the socio-economic data used as an input to the Ames Area MPO TDM. The main variables for generating trips are the number and location of housing (dwelling units) and jobs (employment).

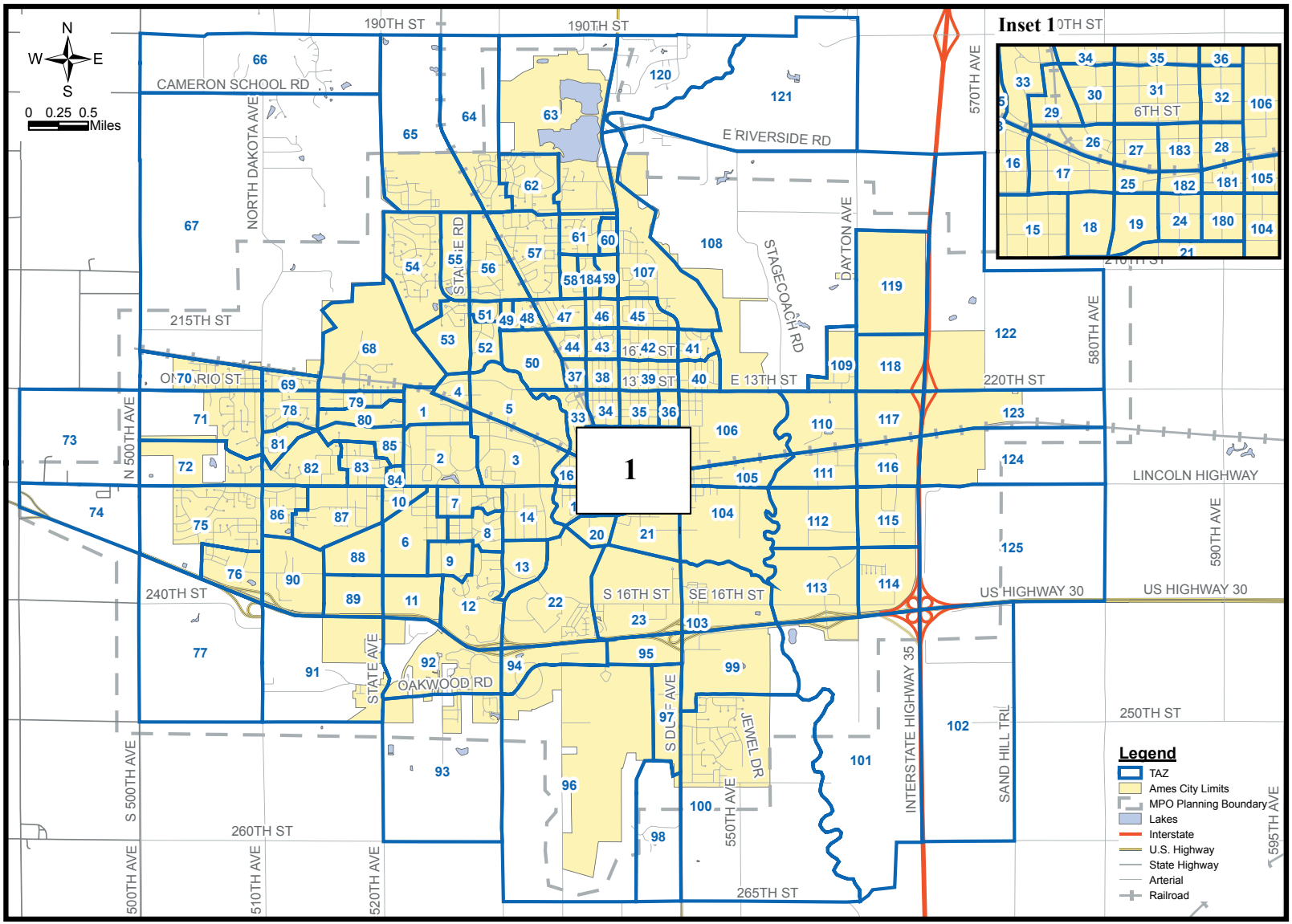


FIGURE 5.2 - TDM TRANSPORATION ANALYSIS ZONES

5.2.2 Existing and Projected Population and Household Data

Population and household data are the base variables used in calculating trip productions in the Ames Area MPO TDM. Current and projected planning horizon population and dwelling units for the study area are documented in Table 5.1.

Model Year	Population	Dwelling Units
2000	53,901	20,737
2030	68,794	27,068

TABLE 5.1 - STUDY AREA POPULATION AND DWELLING UNITS, 2000 AND 2030

5.2.3 Existing and Projected Employment Data

Employment data is the main variable used in calculating trip attractions in the Ames Area MPO TDM. Employment is categorized into retail, service and other jobs for generating trips. Current and projected employment for the study area is documented in Table 5.2.

Model Year	Retail Employment	Non-Retail Employment	Total Employment
2000	7,301	27,734	35,035
2030	13,584	34,130	47,714

TABLE 5.2 - STUDY AREA EMPLOYMENT, 2000 AND 2030

5.2.4 Model Validation

Model validation is an iterative process where the inputs to a computer model are adjusted to get the model to better reflect observed traffic conditions. It is important to have a base year model that reasonably replicates existing traffic levels and travel patterns. Once validated, the existing model is updated to represent future land use and transportation conditions to project future demands on the transportation system in the Ames metropolitan area. Thus, the validation assessment measures how well the model functions. The validation assessment of the model used for this long-range plan indicates that the model is performing reasonably well.

One validation measure is the correlation between observed traffic counts and model predicted traffic volumes (or traffic assignments). Typically, this comparison is carried out for all links and summarized by the square of the correlation coefficient, or r^2. A correlation coefficient of 1.0 indicates a perfect model. A correlation coefficient of 0.0 indicates the model does not accurately predict traffic volumes. For the Ames Area MPO Model, the r^2 comparison of observed counts and model assignments is 0.92, indicating that there is a high

level of correlation between predicted and actual traffic volumes on all links in the study area. Typically, a model is deemed acceptable if the correlation coefficient is greater than 0.88 in accordance with the recommendations provided by the Federal Highway Administration (FHWA).

An additional validation measure is the RMSE or Root Mean Square Error that is more of a weighted standard deviation. This statistical measure is also carried out for all links where traffic counts exist and compares the observed count volumes to the model predicted volumes. A RMSE score of 0% indicates a highly accurate model with no error. Conversely, a RMSE score of 100% indicates a model with a significant amount of error. The FHWA has recommended that a model with a RMSE of 30% or lower is regarded as acceptable. The Ames Area MPO model has a RMSE of 28%, which indicates it has an acceptable amount of error.

Lastly, the National Cooperative Highway Research Program NCHRP study 255 has also identified a measure to determine the acceptable accuracy of a travel demand model. These measurements are done by segments in the model meeting certain volume groupings rather than all together. This is important because when using percentage of error to measure the accuracy of a model higher volume roads will have more absolute error than those with lower volumes. Table 5.3 illustrates the percentage deviation within the volume groupings for the Ames Area MPO model.

Volume Groupings (ADT)	Total Count	Total Model	Deviation Limit	% Deviation
0-5,000	70,220	76,310	60.00%	8.7%
5,000-10,000	126,854	91,335	44.00%	28.0%
10,000-15,000	136,894	128,675	33.00%	6.0%
15,000-25,000	112,757	129,112	30.00%	14.5%
> 25,000	162,046	164,064	25.00%	1.2%

Table 5.3 - Model Accuracy by Volume Groupings, NCHRP 255

5.2.5 2030 Post Processing Technique

A post processing technique described in publication NCHRP-255 was used to adjust the 2030 forecasted volumes. This methodology compares the calibrated travel demand model output with actual traffic counts. The differences between the modeled traffic volumes and the actual traffic volumes are then used to adjust future traffic projections. Traffic projections are affected by a number of factors including:

- The available capacity of the roadway network.
- Type and location of land use in the surrounding area.
- The directness (or lack thereof) of available routes between various zones.
- The characteristics (i.e., design speed) of the roadways between zones.

If any of the factors described above change over the course of the study period (2005-2030), traffic projections may also change. Therefore, it is important to update the Travel Demand Model regularly to maximize accuracy.

5.3 Existing Conditions Travel Demand Model (TDM)

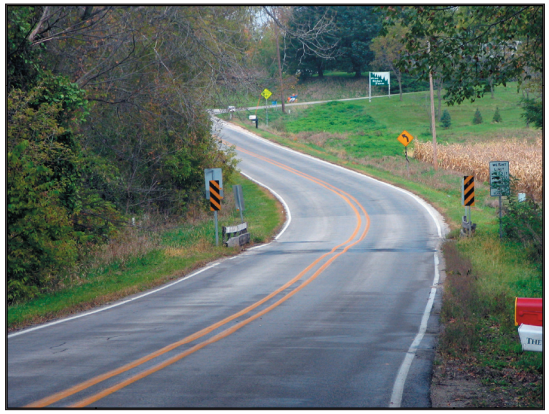
The existing TDM was developed using the street network functionally classified as collector or higher and significant local streets as well as the existing land use. The model was used to identify existing roadway deficiencies that needed to be addressed in the LRTP.

5.3.1 Existing Functional Classifications

The street network within a community is a combination of roadways of various types that serve regional, sub-regional and local traffic. Functional classification is a system used to classify the overall character of a roadway facility. Functional classifications are listed below in their hierarchical order:

- **Principal arterials** typically consist of interstates, U.S. highways and state highways and may include other critical municipal routes. Principal and minor arterials are characterized by a high level of regional and sub-regional traffic and partial to full access control. Mobility along arterials is higher than any other roadway classification.
- **Minor arterials** are described in the above paragraph.
- **Collector roads** typically serve as distributors of local road-way traffic. As such, mobility is less than an arterial but access to property is greater.
- **Local roads** are the lowest rank of the classification hierarchy and primarily serve as land access.

Figure 5.3 provides an illustration of the study area roads federal functional classifications.



North Dakota Avenue is a collector street north of Ontario Street and will see significant increase in traffic over the next 25 years. Improving the roadway to four lanes would be a challenge because horizontal and vertical curves would need to be improved.

5.3.2 Existing TDM Traffic Volumes

Figure 5.4 shows the existing Average Daily Traffic (ADT) volumes for the study area roadways. The majority are year 1999 Iowa DOT annual average daily traffic volumes.

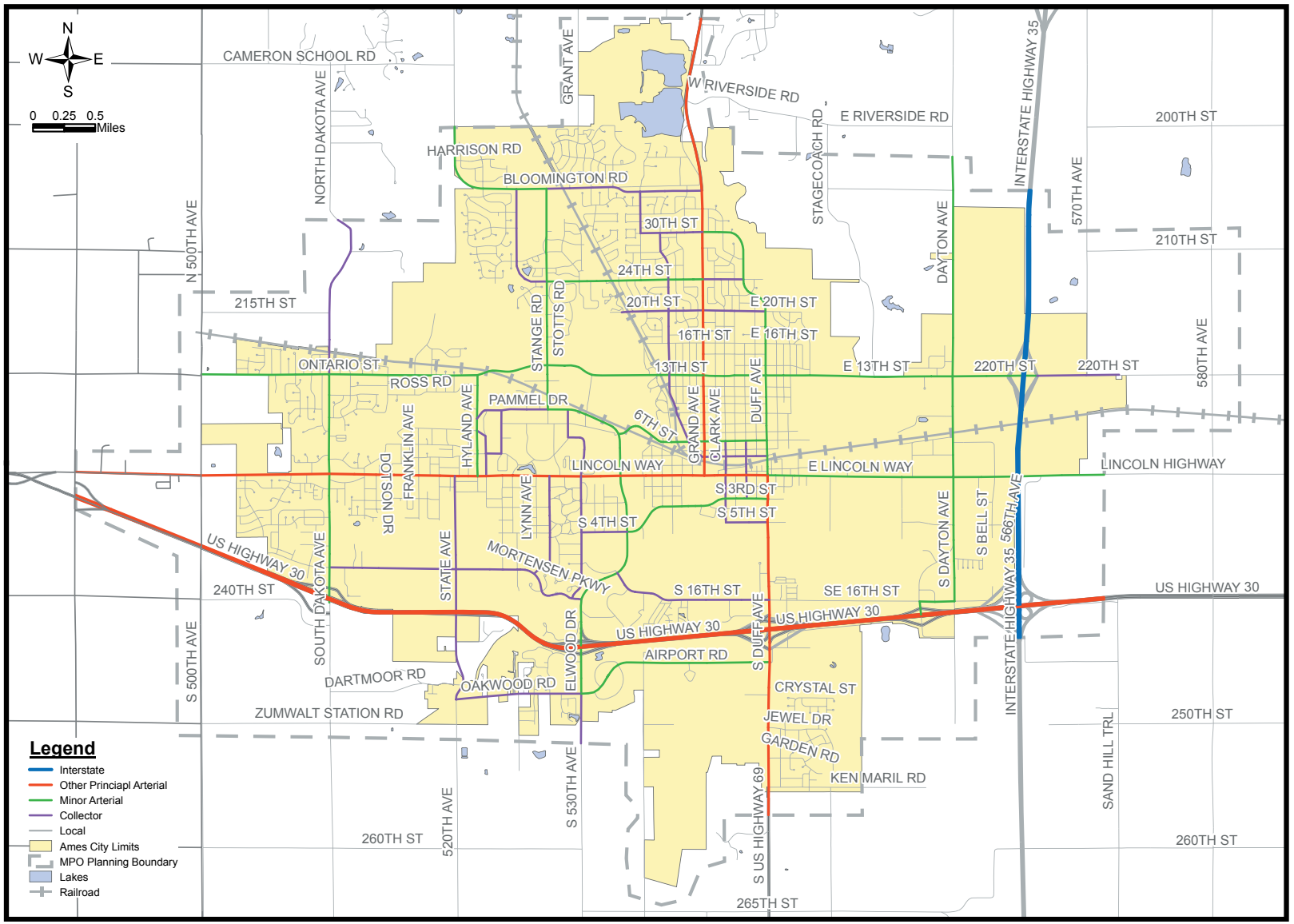


FIGURE 5.3 - EXISTING ROADWAY FUNCTIONAL CLASSIFICATIONS

5.3.3 Existing Levels of Service

An Intersection Capacity Utilization (ICU) peak hour Level Of Service (LOS) analysis was completed for the key intersections within the study area using current traffic volumes. The ICU method was used because it is a simple yet powerful tool for measuring an intersection's LOS and is ideal for traffic planning purposes. The most popular method for analyzing capacity is the Highway Capacity Manual (HCM) methodology, which is based on estimating delay for the intersection. The HCM is used for more detailed analyses to determine such things as left turn lane lengths and traffic signal timing plans.

The analysis was performed in the existing TDM, which uses ICU methodology from Trafficware. The ICU LOS gives insight into how an intersection is functioning and how much extra capacity is available to handle traffic fluctuations and incidents.

Table 5.4 contains a brief description of the conditions expected for each LOS:

The Grand Avenue extension and improvements to South 5th Street will help reduce congestion on Lincoln Way and Duff Avenue.

	A	B	C	D	E	F	G	H
Intersection Capacity Utilization	<60%	60% to 70%	70% to 80%	80% to 90%	90% to 100%	100% to 110%	110% to 120%	>120%
Congestion	None	Very little	No major	Normally none	Right on the verge of congested conditions.	Over capacity and likely experiences congestion periods of 15 to 60 minutes per day.	Over capacity and likely experiences congestion periods of 60 to 120 minutes per day.	Over capacity and could experience congestion periods of over 120 minutes per day.
Other	Can accommodate up to 40 percent more traffic on all movements.	Can accommodate up to 30 percent more traffic on all movements.	Can accommodate up to 20 percent more traffic on all movements.	Can accommodate up to 10 percent more traffic on all movements.	Has less than 10 percent reserve capacity available.	Residual queues at the end of green are common.	Long queues are common.	Long queues are common.

TABLE 5.4 - INTERSECTION LEVEL OF SERVICE (LOS)

Table 5.5 contains the peak hour LOS for key intersections within the study area. For simplification purposes, the LOS were grouped into three categories: A/B/C, D/E and F. LOS F indicates that the intersection is over capacity and has a LOS of F, G or H.

As shown in the table, all intersections have a LOS of A, B or C except the following four intersections:

- Stange Road and 13th Street
- Grand Avenue and 13th Street
- Duff Avenue and Lincoln Way
- S. Duff Avenue and S. 16th Street

Figure 5.4 illustrates the key intersection peak hour LOS.

5.4 2030 Existing Plus Committed Network

Once the existing Travel Demand Model (TDM) was validated and a future land use plan was developed, both elements were combined to forecast future traffic volumes. The study used the 2030 planning horizon in order to provide a minimum 25 year time period between the date of the study and the analysis period for the improvements.

The 2030 Existing Plus Committed (E+C) network consists of the existing roadway network and any transportation improvements to be completed in the next 25 years that have already been committed through prior planning efforts and capital improvement programs in the study area.

Intersection	Peak Hour LOS
Grand Avenue and Bloomington Road	A/B/C
Grand Avenue and 24th Street	A/B/C
Grand Avenue and 16th Street	A/B/C
Stange Road and 13th Street	D/E
Grand Avenue and 13th Street	D/E
Duff Avenue and 13th Street	A/B/C
Dayton Avenue and 13th Street	A/B/C
South Dakota Avenue and Lincoln Way	A/B/C
State Avenue and Lincoln Way	A/B/C
Hyland Avenue and Lincoln Way	A/B/C
Welch Avenue and Lincoln Way	A/B/C
Elwood Drive and Lincoln Way	A/B/C
Grand Avenue and Lincoln Way	A/B/C
S. Walnut Avenue/Clark Avenue and Lincoln Way	A/B/C
Duff Avenue and Lincoln Way	D/E
Dayton Avenue and Lincoln Way	A/B/C
S. Duff Avenue and 3rd Street	A/B/C
Elwood Drive and S. 16th Street	A/B/C
S. Duff Avenue and S. 16th Street	D/E
Dayton Avenue and S.E. 16th Street	A/B/C
Elwood Drive and Mortensen Parkway	A/B/C

TABLE 5.5 - EXISTING PEAK HOUR LOS

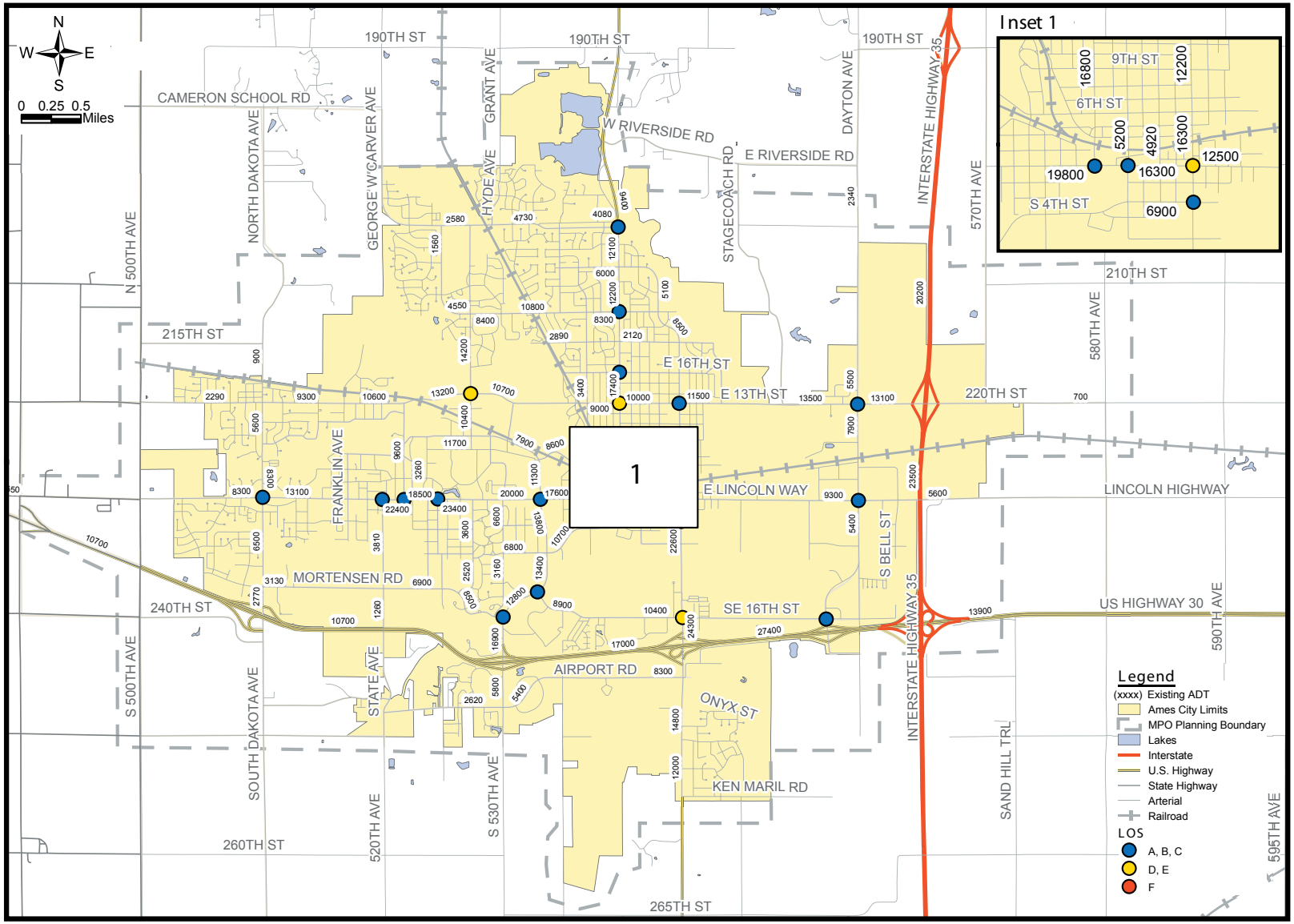


FIGURE 5.4 - EXISTING ADT AND INTERSECTION LOS

The following committed projects were incorporated into the 2030 E+C Network:

- West Lincoln Way Widening to Three Lanes from Thackery Avenue to West City Limits
- East Lincoln Way Widening to Five Lanes from Existing Four-Lane to Dayton Avenue and to Three Lanes from Dayton Avenue to I-35
- US 69/Grand Avenue Widening to Three Lanes from Bloomington Road to 190th Street
- Grand Avenue Extension from Lincoln Way to S. 4th Street (Connects to Squaw Creek Drive)
- Dayton Avenue Extension (three lanes)
- South 16th Street Widening to Four Lanes from Elwood Drive to K-Mart Drive

5.4.1 2030 Existing Plus Committed Traffic Volumes

Figure 5.5 shows the 2030 E+C ADT volumes for the study area roadways.

5.4.2 2030 Existing Plus Committed Levels of Service

Similar to the existing TDM analysis described in the previous section, a peak hour LOS analysis was completed for the key intersections within the study area for the year 2030 using the E+C network. Table 5.6 contains the results of that analysis.

Intersection	Peak Hour LOS[1]
Grand Avenue and Bloomington Road	D/E
Grand Avenue and 24th Street	A/B/C
Grand Avenue and 16th Street	A/B/C
Stange Road and 13th Street	F
Grand Avenue and 13th Street	F
Duff Avenue and 13th Street	A/B/C
Dayton Avenue and 13th Street	F
South Dakota Avenue and Lincoln Way	A/B/C
State Avenue and Lincoln Way	A/B/C
Hyland Avenue and Lincoln Way	A/B/C
Welch Avenue and Lincoln Way	A/B/C
Elwood Drive and Lincoln Way	D/E
Grand Avenue and Lincoln Way	A/B/C
S. Walnut Avenue/Clark Avenue and Lincoln Way	A/B/C
Duff Avenue and Lincoln Way	F
Dayton Avenue and Lincoln Way	D/E
S. Duff Avenue and 3rd Street	D/E
Elwood Drive and S. 16th Street	A/B/C
S. Duff Avenue and S. 16th Street	F
Dayton Avenue and S.E. 16th Street	D/E
Elwood Drive and Mortensen Parkway	D/E

Notes: 1. Intersections in the red boxes signify intersection LOS F, indicating that the intersection is over capacity.

TABLE 5.6 - 2030 EXISTING PLUS COMMITTED PEAK HOUR LOS

The following intersections operate below LOS A, B or C if the improvements identified in the E+C network are the only improvements constructed over the next 25 years:

- Grand Avenue and Bloomington Road
- Stange Road and 13th Street
- Grand Avenue and 13th Street
- Dayton Avenue and 13th Street
- Elwood Drive and Lincoln Way
- Duff Avenue and Lincoln Way
- Dayton Avenue and Lincoln Way
- S. Duff Avenue and 3rd Street
- S. Duff Avenue and S. 16th Street
- Dayton Avenue and SE 16th Street
- Elwood Drive and Mortensen Parkway

Lincoln Way is one of the busiest roadways in the metropolitan area. Pedestrian activity near the ISU campus is significant. Many pedestrians ignore traffic signal indications and cross when there are available gaps.

Figure 5.5 illustrates the key intersection peak hour LOS along with Average Daily Traffic projections for the year 2030.

The 2030 Existing Plus Committed Analysis provided a glimpse of the traffic characteristics citizens can expect if only the planned improvements are constructed. The remainder of the roadway element planning process focuses on identifying projects to address these deficiencies as well as other transportation issues identified by the public.

5.5 Potential Candidate Alternatives

The issues identified through the 2030 Existing Plus Committed Analysis and public input were used as a starting place for the development of the Potential Candidate Alternatives that will ultimately provide a safe, efficient and cost effective roadway system over the next 25 years.

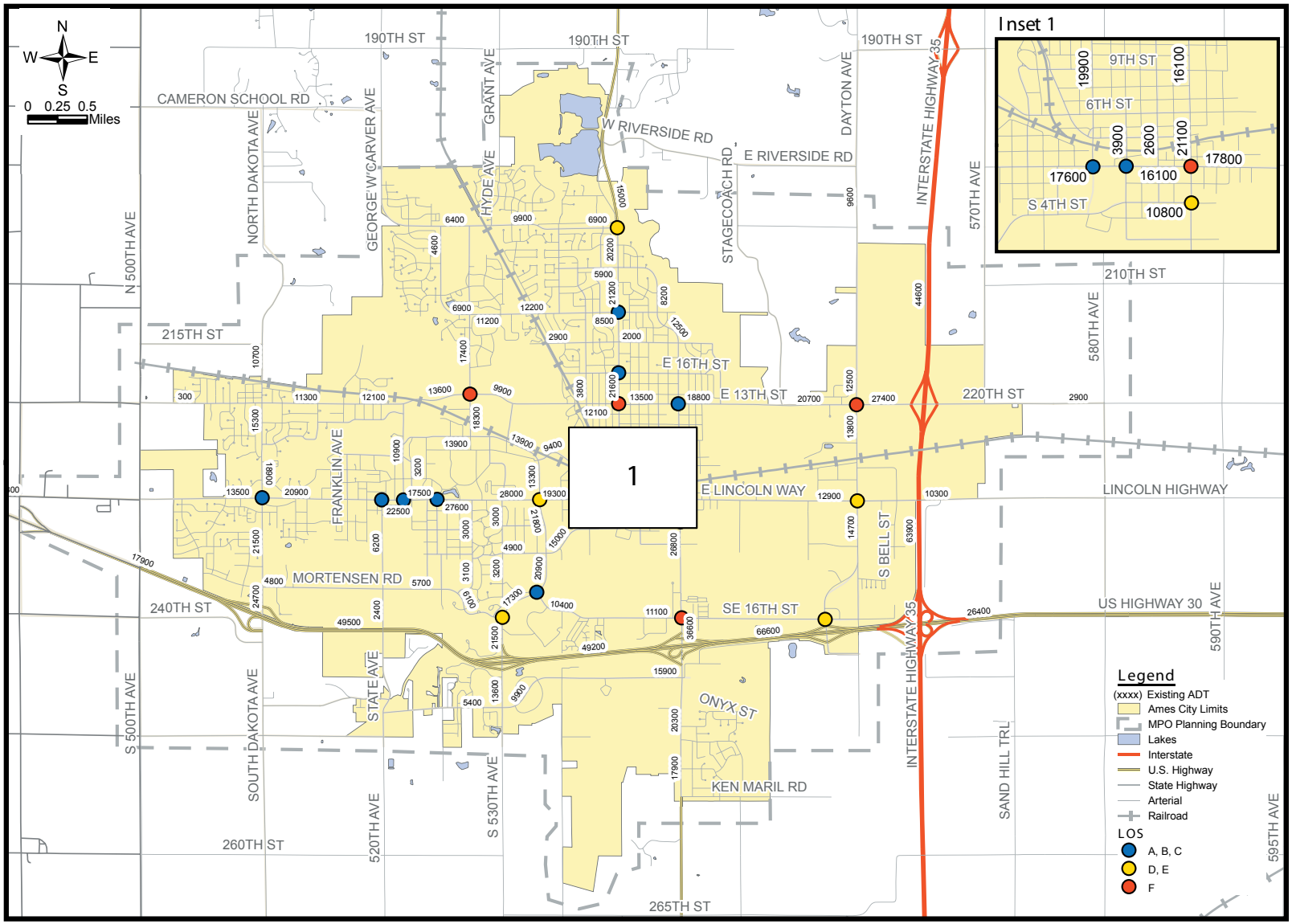


FIGURE 5.5 - 2030 EXISTING PLUS COMMITTED ADT AND INTERSECTION LOS

5.5.1 Potential Candidate Alternative Evaluation Criteria

In order to compare these projects objectively, an evaluation process that accounted for traffic operations, project costs and socio-economic factors was developed. The Potential Candidate Alternative evaluation criteria are shown below in Table 5.7.

Issues	Method of Measurement	Units
Traffic Operation Factors		
Traffic Flow and Congestion	VHT statistics from travel demand model	Daily vehicle hours traveled (VHT)
Reduced Trip Length	VMT statistics from travel demand model	Daily vehicle miles traveled (VMT)
Project Costs		
Construction Costs	Estimated cost of construction in 2005 dollars	Dollars
Socio-Economic Factors		
Roadway User Economic Analysis	Use VMT and VHT statistics to determine benefits compared to construction costs	B/C Ratio

TABLE 5.7 - POTENTIAL CANDIDATE ALTERNATIVE EVALUATION CRITERIA

Notes on the above evaluation criteria are as follows:

- **Traffic Operation Factors** - the traffic operations factors included analysis of the traffic flow, congestion and trip length.
  - In order to analyze the traffic flow and congestion for each Potential Candidate Alternative, the Travel Demand Model was used to determine the change in daily Vehicle Hours Traveled (VHT) for each individual alternative compared to the 2030 E+C Network. For the intersection and interchange alternatives, the change in VHT was calculated using the intersection average delay calculations as described in the Highway Capacity Manual.
  - The projected change in trip length was calculated for each alternative by using the TDM, which calculated the change in Vehicle Miles Traveled (VMT) for each alternative.
- **Project Costs** – planning level construction costs were developed for each Potential Candidate Alternative using year 2005 dollars. It should be noted that it does not include cost for right-of-way.
- **Socio-Economic Factors** – an important criterion in evaluating each Potential Candidate Alternative is roadway user economic values. The benefits are compared with the costs (B/C ratio) to determine the economic feasibility over a 25-year period.
  - The cost includes constructing the proposed improvement minus the residual values based on the useful lives of the various construction elements.
  - The benefit includes the economic benefit to the roadway user by the change in travel time and travel distance as determined by the TDM. For each alternative, benefits were estimated for the same two analysis years, 2000 and 2030, consistent with the analysis years of the TDM.
    - To include time savings in the evaluation, it was necessary to place a monetary value on time saved. For the purpose of this study, values of time based on mean wage rates in the Story County region were used. The value of time used was $17.21/hour.
    - The savings in Vehicle Miles Traveled for each alternative was determined using a cost of $0.405 per mile, which is the current estimated average vehicle cost per mile allowed by the Internal Revenue Service for tax purposes.

5.5.2 Potential Candidate Alternative Descriptions

The Appendix contains a plan view illustration of each Potential Candidate Alternative on aerial photography.

5.5.3 Potential Candidate Alternative Evaluation

The Potential Candidate Alternatives are compared using the evaluation criteria in Table 5.8.

Although the 20th St extension (west of Ames High School) project was not pursued in this long range transportation plan, the MPO policy board recommended a traffic study be conducted to reduce congestion on Hayes Ave during high school peak periods.

Alternative Num.	Alternative Name	Year 2000		Year 2030		25 Year Net Present Value (2005 Dollars)	Total Costs (2005 Dollars)	25 Year Benefit - Cost Ratio
		Changes in VMT (mi)	Changes in VHT (mi)	Changes in VMT (mi)	Changes in VHT (mi)			
1	U.S. 30/580th Ave Grade Separation	-	(1)	-	(195)	$6,192,900	$8,300,000	1.00
2	Grand Ave Extension-Lincoln Way to Squaw Creek Dr	NA	NA	NA	NA	NA	3600000	NA
3	Grand Ave Extension-South 5th St to South 16th St	(101)	(64)	(9)	(128)	$6,291,900	$4,500,000	1.46
4a	Elwood Dr Extension-6th St to 13th St	(392)	1	(1,344)	(12)	$1,657,000	$9,800,000	0.22
4b	Elwood Dr Extension/13th St & Stange Rd Intersection Improvements	(270)	(12)	(883)	(26)	$2,088,400	$9,900,000	0.32
5a	13th St/Stange Rd Intersection Improvements	-	(3)	-	(7)	$312,900	$2,900,000	0.14
5b	13th/Stange Rd Roundabout	-	(127)	-	(182)	$10,014,700	$1,100,000	10.22
6	Lincoln Way/Duff Ave Intersection Improvements	-	(71)	-	(115)	$6,009,600	$2,700,000	3.19
7	Lincoln Way/Clark Ave/South Walnut Ave Intersection Improvements	-	(5)	-	(7)	$588,400	$2,100,000	0.39
8	East Lincoln Way Over I-35 Bridge Widening & Roadway Widening	(4)	(3)	(312)	(46)	$1,791,200	$5,500,000	0.40
9	South Duff Ave Widening	-	(2)	-	(70)	$2,281,100	$3,300,000	0.80
10	County Line Rd Reconstruction	NA	NA	NA	NA	NA	$1,600,000	NA
11	East 13th St Widening	NA	NA	NA	NA	NA	$5,200,000	NA
12	U.S. 30/South Dakota Ave. Interchange	-	(0)	-	(2)	$80,600	$900,000	0.10
13	Mortensen Rd Extension	8	(7)	(1,756)	(24)	$2,295,400	$2,800,000	0.95
14	South 5th St Extension	195	(11)	21	(24)	$959,500	$2,600,000	0.39
15	SE 5th St Extension	(418)	(19)	(1,824)	(93)	$5,270,500	$10,700,000	0.58
16	13th St/Grand Ave Intersection Improvements	-	(96)	-	(129)	$7,316,300	$4,000,000	2.38
17	580th Ave Widening	NA	NA	NA	NA	NA	$5,100,000	NA
18	Oakwood/Zumwalt Station Rd Realignment	(8)	2	189	2	-$265,000	$4,400,000	- 0.07
19	Dotson Dr Extension	36	(13)	311	(30)	$1,126,900	$1,500,000	0.94
20	Freel Dr Reconstruction and Extension	52	(5)	(1,220)	(50)	$2,616,500	$3,100,000	1.05
21	Bloomington Rd Extension-G.W. Carver Ave to County Line Rd	(1,309)	(89)	337	(67)	$5,906,100	$18,700,000	0.40
22	Bloomington Rd Extension-Grand Ave to 570th Ave	405	(225)	1451	(515)	$22,469,400	$24,500,000	1.20
23	16th St/Grand Ave Intersection Improvements	-	(1)	-	(1)	$177,900	$1,700,000	0.12
24	Dayton Ave Widening	-	-	216	(10)	$155,500	$3,400,000	0.05
25	Mortensen Rd and South 16th St Connection	(40)	8	(309)	(11)	$339,900	$2,600,000	0.11
26	North Dakota Ave/UPRR Crossing Grade Separation	NA	NA	NA	NA	NA	$4,400,000	NA
27	20th St Extension	(131)	(5)	(255)	(4)	$588,700	$1,900,000	0.36
28	SE 16th St Reconstruction	8	(16)	(2,835)	(141)	$7,101,900	$6,600,000	1.82
29	North and West Beltway	744	(101)	9,261	(1,335)	$38,141,000	$86,700,000	0.51
30	South and West Beltway	(1,230)	(28)	158	(428)	$15,337,200	$73,500,000	0.24
31	Bloomington Rd/UPRR Grade Separation	NA	NA	NA	NA	NA	$4,500,000	NA
32	Harrison Rd Extension and UPRR Grade Separation	NA	NA	NA	NA	NA	$2,300,000	NA
33	20th St/Grand Ave Intersection Improvements	-	(3)	-	(5)	$616,200	$1,600,000	0.44
34	Lincoln Way/Hyland Ave Intersection Improvements	-	(6)	-	(18)	$1,015,200	$2,500,000	0.47
35	South 5th St and Lincoln Way Connection	(436)	(14)	(1,782)	(51)	$3,756,800	$5,300,000	0.80
36	South Dakota Ave. Widening	1153	(33)	3816	(248)	$5,200,700	$2,000,000	3.02
37	U.S. 69 Widening	329	(19)	801	(95)	$2,787,700	$3,200,000	1.04
38	Lincoln Way Widening-Franklin Ave to Marshall Ave	-	(1)	-	(1)	$878,800	$1,100,000	0.92
39	North Dakota St Widening-Ontario St to Onion Creek Ln	22	-	3	(79)	$2,478,700	$5,500,000	0.51
40	SE South 16th Street Widening	NA	NA	NA	NA	NA	$900,000	NA
41	SE 3rd St to Lincoln Connection	(241)	(8)	(439)	(25)	$1,578,100	$3,200,000	0.55
42	570th Avenue Reconstruction	NA	NA	NA	NA	NA	$3,800,000	NA

TABLE 5.8 - POTENTIAL CANDIDATE ALTERNATIVE COMPARISON

= Undetermined Benefit Calculation
= Highway Capacity Manual control delay used to calculate time savings
= Highway Capacity Manual control delay used to calculate time savings. Safety Benefits also added
= Travel Demand Model used to determine daily time and mileage savings

5.5.4 Potential Candidate Alternatives Elimination

The Potential Candidate Alternative evaluation process identified several projects to remove from further consideration because of poor economic feasibility and/or lack of support for the project during the public participation process. Table 5.9 contains the eliminated Potential Candidate Alternatives as well as brief explanations of why they were removed.

Alternative Number	Alternative Name	Reason for Elimination
2	Grand Avenue Extension from Lincoln Way to Squaw Creek Drive	- Already a committed project.
4a	Elwood Drive Extension – 6th Street to 13th Street	- Would go through established park. - A better alternative exists.
5b	Stange Road/13th Street Roundabout	- Two-lane roundabout may be confusing. - Lower cost alternative exists.
8	East Lincoln Way Roadway and Bridge Over I-35 Widening from Bell Avenue to 580th Avenue	- Traffic projections did not support need to widen to four lanes.
11	East 13th Street Widening from I-35 to 580th Avenue	- Widening is not needed if the mall is not built. If the mall is constructed, the developer will pay for the widening.
12	U.S. 30/South Dakota Ave. Interchange – SE quadrant	- Traffic analysis does not support the need for the additional ramp.
15	SE 5th Street Extension from S. Duff Avenue to S. Bell Avenue	- Roadway would go through floodway and floodplain. - Bridge over Squaw Creek would be expensive. - Limited economic development potential.
17	580th Avenue Widening from 13th Street to U.S. 30	- Traffic projections did not support need to widen to four lanes.
18	Oakwood Road/ Zumwalt Station Road Realignment	- Traffic projections do not support new alignment and paving.
23	16th Street/Grand Avenue Intersection Improvements	- Traffic projections do not support project.
24	Dayton Avenue Widening	- Traffic projections do not support widening. - Roadway improvements and mixed use trail planned adjacent to USDA Lab.
25	Mortensen Road and S. 16th Street Connector	- Minimal traffic benefits. - Potential impacts to Veterinary College.
27	20th Street Extension	- Only serves Ames High School traffic from the north and west. - Potential environmental impacts.

TABLE 5.9 - ELIMINATED POTENTIAL CANDIDATE ALTERNATIVES

Alternative Number	Alternative Name	Reason for Elimination
29	North and West Beltways – U.S. 30 (west) to I-35 (north)	- Low benefits compared to the construction cost.
30	South and West Beltways – U.S. 30 (west) to I-35 (south)	- Low benefits compared to the construction cost.
31	Bloomington Road/ Union Pacific Railroad Grade Separation	- Impacts to adjacent properties. - Relatively low train traffic.
32	Harrison Road Extension and Union Pacific Railroad Grade Separation	- Impacts to adjacent properties. - Relatively low train traffic.
34	Lincoln Way/Hyland Avenue/Sheldon Avenue Intersection Improvements	- May require taking historic building. - Limited benefits to safety and congestion reduction.
38	Lincoln Way Widening from Marshall Avenue to Franklin Avenue	- Limited benefits to safety and congestion reduction.
39	North Dakota Avenue Widening from Union Pacific Railroad to Onion Creek Lane	- Traffic projections do not support widening. - Impacts to adjacent property.
40	S. 16th Street Widening	Already a committed project.
41	SE 3rd Street/Lincoln Way Connector	The SE 5th Street/Lincoln Way Connector project (#35) will accomplish the purpose of this project.

5.6 Improvement Groups

Analyzing each Potential Candidate Alternative individually is not a true measure of how one project might work with another. Some projects may not be cost effective unless considered in combination with other projects. By looking at volume changes associated with each alternative, it is clear that an individual project can have a significant effect on the traffic volumes on surrounding roadways. Therefore, if one project is constructed, it may eliminate the need for another. As a result, the next step in the Ames Area MPO LRTP included combining the various projects within the Potential Candidate Alternatives into Improvement Groups that are described below. Please refer to the Appendix for plan view project illustrations on top of an aerial.

Base Projects

The Base Projects that were included in each of the Improvement Groups are as follows:

1. U.S. 30 and 580th Avenue Grade Separation
A new interchange at the U.S. 30 and 580th Avenue intersection would be constructed. Currently the intersection is at-grade.

3. Grand Ave Extension from S. 5th Street to S. 16th Street
This project involves an extension of Grand Avenue between South 5th Street and South 16th Street. The segment from South 5th Street to approximately 800 feet north of South 16th Street would be a three-lane section. The segment from approximately 800 feet north of South 16th Street to South 16th Street would be a four-lane divided section with left turn lanes. Currently this roadway does not exist.

5a. 13th Street and Stange Road Intersection Improvements
The 13th Street and Stange Road intersection would be reconstructed to add left turn lanes to Stange Road.

6. Lincoln Way and Duff Avenue Intersection Improvements
The Lincoln Way and Duff Avenue intersection would be reconstructed to add left turn lanes to Lincoln Way.

7. Lincoln Way and Clark Avenue/S. Walnut Avenue Intersection Improvements
The Lincoln Way and Clark Avenue/S. Walnut Avenue intersection would be reconstructed to add left turn lanes to Lincoln Way.

9. South Duff Avenue Widening from Kitty Hawk Drive to Ken Maril Road
This alternative would widen the current two-lane South Duff Avenue from Kitty Hawk Drive to Ken Maril Road to a paved five-lane roadway.

10. County Line Road Reconstruction from Mortensen Road to West Lincoln Way
The two-lane gravel County Line Road from Mortensen Road to West Lincoln Way would be reconstructed to a two-lane paved road.

Grand Avenue from 13th St to 20th Street currently does not have left turn lanes. This plan recommends left turn lanes be constructed at 20th St and 13th St.

13. Mortensen Road Extension from Miller Avenue to County Line Road (with County Line Road Reconstruction described above)
This alternative proposes an extension of Mortensen Road between Miller Avenue and County Line Road. The new roadway would be a three-lane section. Currently this portion of Mortensen Road does not exist.

14. South 5th Street Extension from Grand Avenue to South Duff Avenue
South 5th Street would be extended between Grand Avenue and South Duff Avenue. It would be a three-lane section between South Duff Avenue and Walnut Avenue and a two-lane section with left turn lanes at the intersections between Walnut Avenue and Grand Avenue. Currently the portion of South 5th Street between Walnut Avenue and Grand Avenue does not exist.

16. 13th Street and Grand Avenue Intersection Improvements
The 13th Street and Grand Avenue intersection would be reconstructed to add left turn lanes to both 13th Street and Grand Avenue.

19. Dotson Drive Extension from Aplin Road to Mortensen Road
This alternative proposes an extension of Dotson Drive between Aplin Road and Mortensen Road. The new roadway would be a two-lane section. Currently this portion of Dotson Drive does not exist.

20. Freel Drive Reconstruction and Extension from Lincoln Way to Dayton Avenue
Freel Drive would be extended from SE 5th Street to the future SE 9th Street and Dayton Avenue intersection. The extension is planned to be a two-lane section. Additionally, Freel Drive from SE 5th Street to East Lincoln Way will be reconstructed as a paved two-lane section.

26. North Dakota Avenue and Union Pacific Railroad Crossing Grade Separation
A four-lane bridge over the U.P.R.R. on North Dakota Avenue would be constructed. North Dakota Avenue would be widened to four lanes on the approaches to the bridge.

28. SE 16th Street Reconstruction from South Duff Avenue to South Dayton Avenue
The two-lane SE 16th Street from Lark Avenue to South Dayton Avenue would be reconstructed from a gravel road to a paved road. The project would also improve the intersections along SE 16th Street at South Duff Avenue and Dayton Avenue.

33. 20th Street and Grand Avenue Intersection Improvements
The 20th Street and Grand Avenue intersection would be reconstructed to add left turn lanes to Grand Avenue.

35. SE 5th Street and Lincoln Way Connection
This alternative would extend SE 5th Street from South Duff Avenue to East Lincoln Way. The proposed roadway section would be three lanes.

36. South Dakota Avenue Widening from Lincoln Way to Mortensen Road
The current two-lane section on South Dakota Avenue from Mortensen Road to Lincoln Way would be widened to a five-lane section.

37. U.S. 69 Widening from Bloomington Road to Riverside Road
This alternative would widen the current two-lane U.S. 69 section from Bloomington Road to Riverside Road to a five-lane section.

Improvement Group 1

Improvement Group 1 includes the Base Projects in conjunction with the following projects:

4b. Elwood Drive Extension from 6th Street to 13th Street/ 13th Street and Stange Road Intersection Improvement
This project proposes an extension of Elwood Drive between 6th Street and 13th Street. Haber Road would be widened to a four-lane section between Pammel Drive and 13th Street. The major through movement would be from Elwood Drive to Haber Road with Pammel Drive teeing into the new Haber Road. A railroad bridge would be built to replace the current tunnel under the U.P.R.R. on Haber Road and to accommodate the widening of Haber Road and the tee intersection with Pammel Drive.

Duff Avenue north of 5th St is one of the most scenic arterial roadways in Ames. The extension of Grand Ave south of Lincoln Way should help reduce expected increases in traffic on Duff Ave and Lincoln Way.

Additionally, this alternative involves the reconstruction of the 13th Street and Stange Road intersection to add an exclusive westbound right turn lane. The intersection would also receive new pavement markings. The 13th Street and Stange Road intersection improvement replaces project 5a.

Improvement Group 2

Improvement Group 2 includes the Base Projects in conjunction with the following projects:

21. Bloomington Road Extension from G.W. Carver Avenue to County Line Road
This alternative involves extending Bloomington Road between G.W. Carver Avenue and County Line Road. The roadway would be a paved two-lane section. Intersections will be built at North Dakota Avenue, County Line Road and G.W. Carver Avenue. Currently this roadway does not exist. Additionally, this project involves widening the existing Bloomington Road to four lanes from just east of the UPRR to just west of G.W. Carver Avenue.

22. Bloomington Road Extension from Grand Avenue to 570th Avenue
The project entails the construction and reconstruction of a paved two-lane roadway. Intersections will be built at Stage Coach Road, Dayton Avenue and 570th Avenue. An interchange will be built at I-35. Currently this roadway does not exist except for the section of Old Bloomington Road between Stage Coach Road and Dayton Avenue. This project includes preparing an Environmental Impact Study.

42. 570th Avenue Reconstruction
570th Avenue would be reconstructed as a two-lane paved section from 13th Street to the proposed Bloomington Road Extension project. Currently the road is gravel.

Improvement Group 3

Improvement Group 3 includes the Base Projects in conjunction with Group 1 and Group 2 projects as follows:

4b. Elwood Drive Extension from 6th Street to 13th Street/ 13th Street and Stange Road Intersection Improvement
21. Bloomington Road Extension from G.W. Carver Avenue to County Line Road
22. Bloomington Road Extension from Grand Avenue to 570th Avenue
42. 570th Avenue Reconstruction

The Appendix contains a city map showing the project locations as well as a map showing the key intersection LOS and change in traffic volumes from the 2030 E+C Network for the Base Projects and all three Improvement Groups. It should be noted that a more detailed LOS analysis was completed for alternatives within the Improvement Groups. If the ICU LOS was below LOS C for an individual intersection, a more detailed LOS was obtained using Highway Capacity Manual (HCM) methodology.

The evaluation criteria described in Table 5.7 and the additional criteria contained in Table 5.10 were used to compare the Improvement Groups.

Issues	Method of Measurement	Units
Project Cost		
Right-of-Way Cost	Estimated cost of right-of-way using generalized costs in 2005 dollars.	Dollars
Land Use		
Consistency with Land Use Plan	Review and evaluation of the land use plan.	Yes/No
Socio-Economic Factors		
Number of Residential Units Purchased	Number of homes anticipated to be purchased.	Units
Number of Businesses Purchased	Number of businesses anticipated to be purchased.	Businesses

TABLE 5.10 - IMPROVEMENT GROUP ADDITIONAL EVALUATION CRITERIA

Issues	Units	E+C	Base		Group 1		Group 2		Group 3	
		Values	Values	Change from E+C Conditions	Values	Change from E+C Conditions	Values	Change from E+C Conditions	Values	Change from E+C Conditions
Traffic Operation Factors										
Traffic Flow and Congestion	Daily Vehicle hours traveled	48,105	47,364	(741)	47,342	(763)	46, 948	(1,157)	46,923	(1,182)
Reduced Trip Length	Daily vehicle miles traveled	2,091,500	2,093,864	2,364	2,093,737	2,237	2,094,369	2,869	2,095,073	3,573
Project Cost										
Construction Cost	Dollars	N/A	$58,000,000	N/A	$64,800,000	N/A	$96,100,000	N/A	$106,700,000	N/A
Right-of-Way Cost	Dollars	N/A	$4,400,000	N/A	$4,700,000	N/A	$10,500,000	N/A	$10,800,000	N/A
Land Use										
Consistency with Land Use Plan	Yes/No	N/A	Yes		Yes		Yes		Yes	
Socio-Economic Factors										
Roadway User Economic Analysis	B/C Ratio	N/A	0.53	N/A	0.50	N/A	0.59	N/A	0.57	N/A
Number of Residential Units Purchased	Units	N/A	3	N/A	3	N/A	5	N/A	5	N/A
Number of Businesses Purchased	Businesses	N/A	4	N/A	4	N/A	5	N/A	5	N/A

TABLE 5.11 - IMPROVEMENT GROUP COMPARISONS = best in category = tie

5.7 Proposed Roadway Improvement Plan

Through the July 27, 2005 Technical Committee meeting and the August 4, 2005 Public Meeting, Improvement Group 3 was chosen as the proposed roadway improvement plan to carry forward in the LRTP. As stated above, this Improvement Group is a combination of Group 1 and Group 2. Figure 5.6 illustrates the proposed roadway improvement plan. Additionally, refer to the Appendix for Improvement Group 3 city map showing the project locations as well as a map showing the key intersection LOS and change in traffic volumes from the 2030 E+C Network.

The proposed roadway improvement plan was analyzed in the TDM and is referred to as the Approved Network. Figure 5.7 illustrates the Approved Network TDM ADT volumes and intersection LOS. All key intersection LOS are above LOS C.

5.8 ITS Opportunities

As future roadway improvements are made, intelligent transportation systems (ITS) should be included in the projects. ITS encompasses a broad range of technologies that are incorporated into the transportation system. The purpose of this technology includes monitoring traffic, reducing congestion and providing route information to travelers. A regional architecture study is currently in progress and is scheduled to be completed in the fall of 2005. It will contain further details on the planned Ames area ITS elements.

An ITS Workshop was conducted in January 2005, to discuss potential opportunities. The participants include: City of Ames, CyRide, Mary Greeley Medical Center Ambulance, Iowa State Patrol, Story County Sheriffs's Office, City of Ames' Police, FHWA and the Iowa DOT.

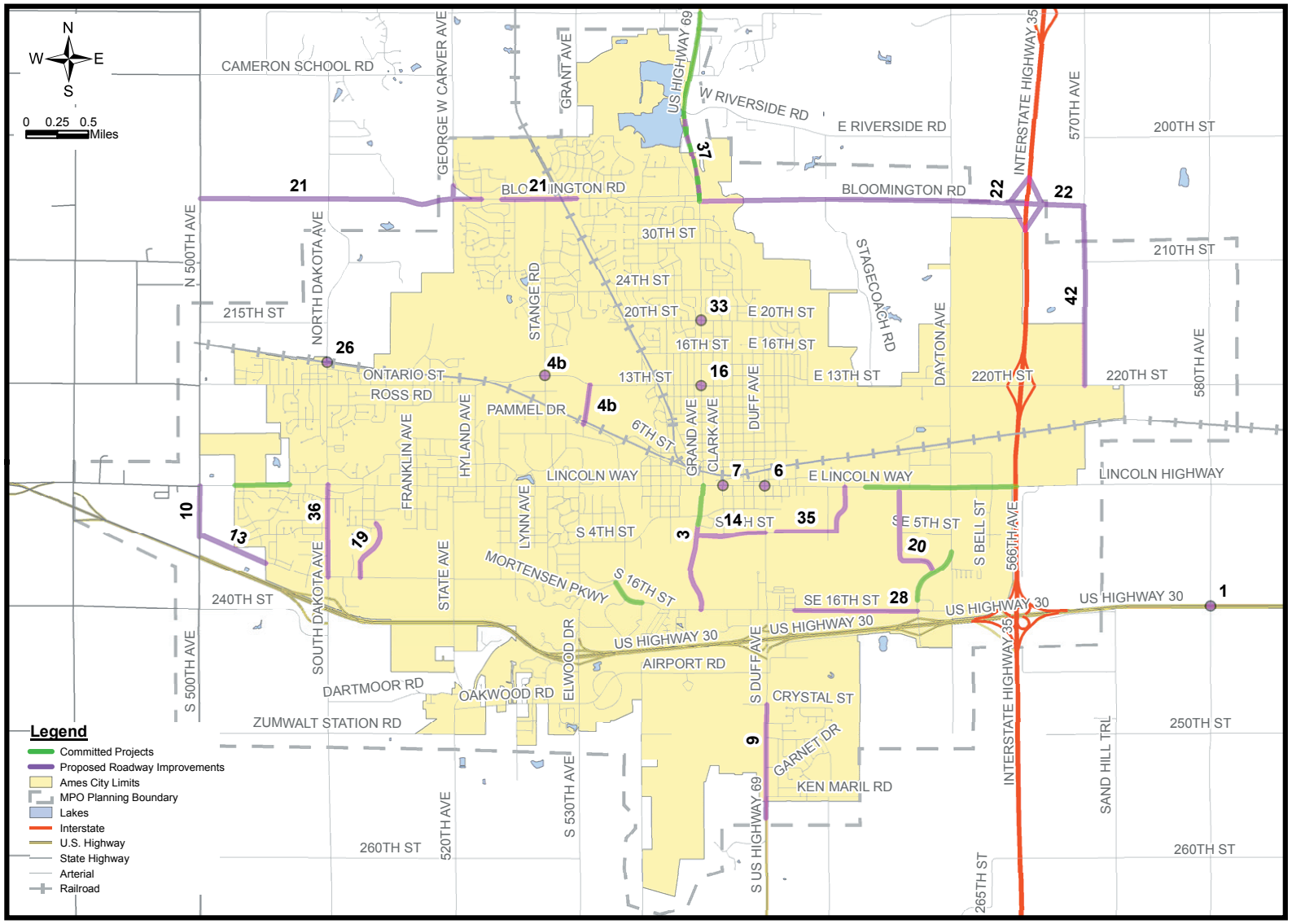


FIGURE 5.6 - PROPOSED ROADWAY IMPROVEMENT PLAN

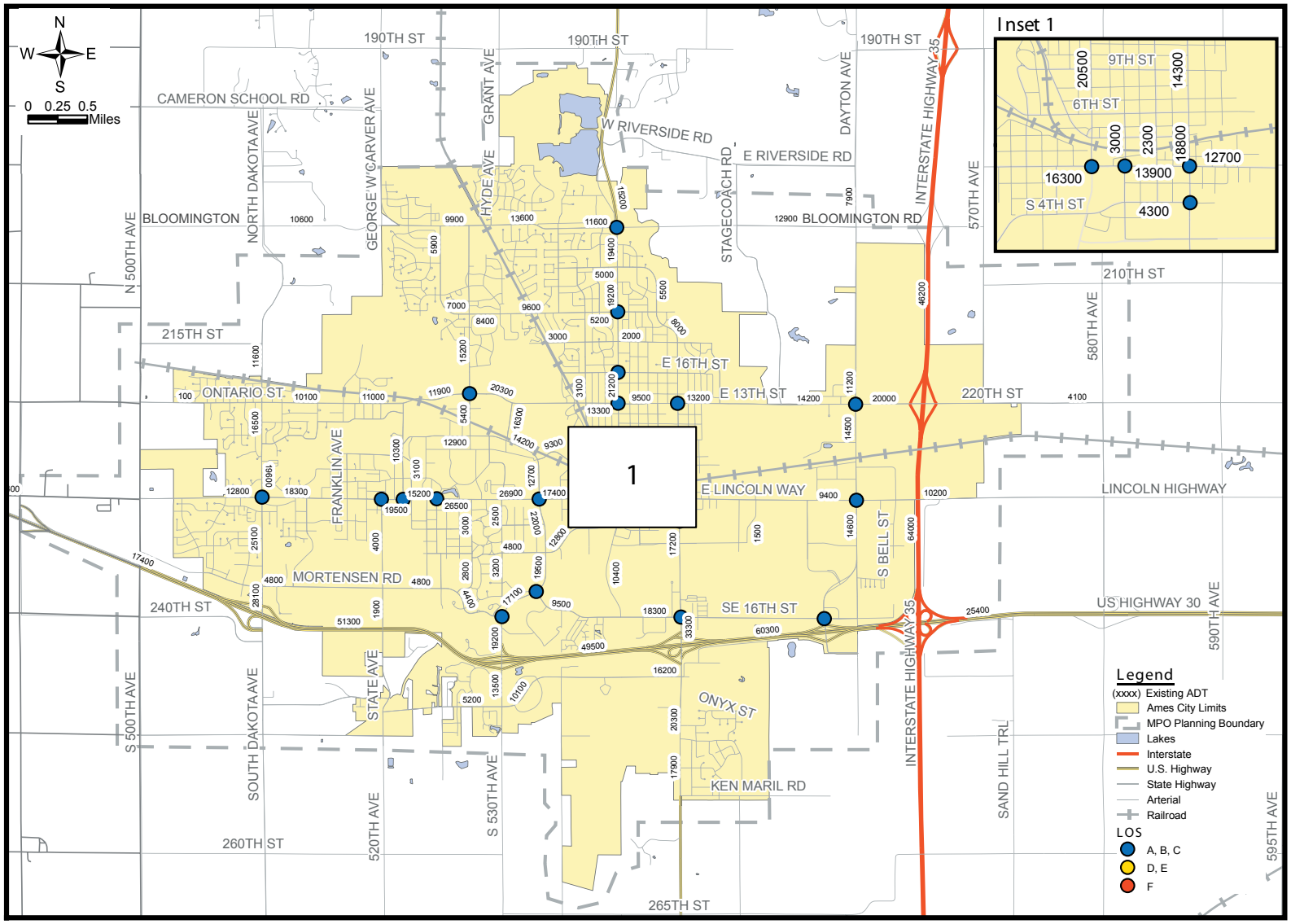
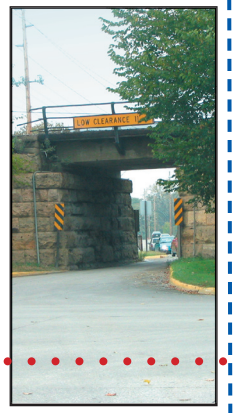
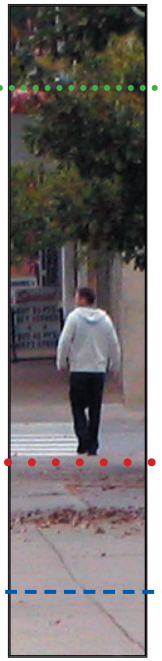


FIGURE 5.7 - 2030 APPROVED NETWORK ADT AND INTERSECTION LOS

Bicycles and Pedestrians

Section 6





HWS

Solutions Through Service

Bicycle and pedestrian systems play many roles in a community by promoting mobility, recreation and health, economic development and community image and quality. Ames presently enjoys a relatively high level of service from its sidewalk and trail system. However, this chapter aims to address gaps in the present system, provide better facilities for recreation and improve connectivity to the regional trail system.

This element builds upon the Ames Transportation Master Plan (2000), which itself incorporated the City's adopted Bicycle Facility Master Plan (1997). The previous plan envisioned expanding the bicycle and pedestrian system to serve both daily (work, school, personal) and recreational trips and to promote bicycling, walking and in-line skating in the community. This vision furthers the Ames Land Use Policy Plan (LUPP) goals of Environmental friendliness, Sense of Place and Connectivity and Mobility and Alternative Transportation. Ames has made great progress in accomplishing these goals in recent years.

6.1 Bicycle and Pedestrian Demand

As a university community, Ames experiences much higher levels of non-automotive travel than similarly-sized, non-university communities. According to the 2000 Census, 8.6% of all Ames employees indicated that their primary means of transportation to work was by bicycle or on foot. While this figure is comparable to Iowa City (10.2%), it is about eight times higher than non-university Iowa cities. For example, the percent of workers walking and bicycling to work in Fort Dodge, Burlington and Marshalltown are 0.9%, 1.0% and 1.2% respectively. To put these numbers in perspective, Davis, California, sometimes referred to as "The Bicycle Capital of the U.S," estimates that 20-25% of all trips in the city are made by bicycle. While bicycle trips in Ames fall below this level, the city still experiences significant bicycle and pedestrian traffic.

The ETC Institute survey, discussed earlier in this plan, indicated that 14% of respondents bicycle or walk as their normal method of transportation to work or school. Nearly one-half (48%) of all survey respondents indicated that they had ridden a bicycle on Ames public streets during the past year. Of those, 71% indicated that they felt "safe" or "very safe" bicycling on the streets, while 28% indicated that they felt "not very safe". By contrast, 88% indicated that they felt "safe" or "very safe" bicycling on bike paths, while only 3% indicated they felt "not very safe".

This interest in bicycling and concern with safety resulted in high stated priorities for bicycle facility improvements from the survey respondents. The "availability of bike lanes" tied for fourth place, among sixteen options, with "condition of roadway" and "neighborhood traffic safety" as the "most important priority for improving transportation in the City of Ames. Likewise, "availability of bicycle lanes" scored next to the last among sixteen alternatives regarding satisfaction

13th St currently has a shared use path along the north side of the road. This path would be extended to east of I-35 if a new shopping center is constructed in the area.

with various aspects of the transportation system in Ames. About 70% of respondents indicated that they would be "very supportive" or "somewhat supportive" of "adding dedicated bike lanes on some streets." This placed bike lanes third priority among eleven alternative system enhancements.

In the 2004 Ames Residential Satisfaction Survey, prepared by the Iowa State University Extension Service, respondents rated bike paths as compared to a broad range of city facilities and improvements; 89% of respondents rated the "adequacy of bike path system" as "very good" or "good," with only 11% rating the system "poor." Corresponding to this expressed high level of satisfaction, bike path improvements rated in the middle of a group of nine alternative capital improvements with slightly over half of the respondents indicating that such improvements were "very or somewhat important."

The City of Ames has reacted to this demand for bicycle facilities by significantly increasing funding for trail improvements over the last five years. At the time of the 2000 Transportation Master Plan, the City of Ames was spending approximately $75,000 per year on bicycle facility improvements. That plan recommended that the average annual expenditure to improve the bikeway system over the next 20 years be increased by more than 100 percent to approximately $185,000 per year—a level the city has already exceeded. In fact, the current draft of the Year 2005/06 to 2009/10 Capital Improvements Plan calls for the expenditure of $1.12 million over the five year period, for an annual average of approximately $220,000. Those CIP projects are funded from a mix of Local Option Sales Tax, MPO/STP Funds and developer funding.

6.2 Bicycle Facilities Plan

The traditional concept of trail systems involves a network of off-street facilities that are routed on their own rights-of-way and are completely separated from roadways. While this type of trail is the most desirable alternative, the proposed function of the Ames' bicycle system, the absence of clearly defined corridors in some locations, and the urban context of many parts of the city require a trail system that uses several design configurations. While this discussion does not present comprehensive design standards for bicycle facilities, it proposes a system composed of several basic types.

Terms used in this section include:

Bicycle Facilities: A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically designated for bicycle use.

Bikeway: A generic term for any road, street, path or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

Bicycle Lane or Bike Lane: A portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists.

Rail-Trail: A multi-use trail built within the right-of-way of an abandoned railroad.

Rail with Trail (RWT): A multi-use trail built within the right-of-way of an operating rail line.

Terms continued:

Shared Roadway: A roadway which is open to both bicycle and motor vehicle travel. This may be an existing roadway, street with wide curb lanes or road with paved shoulders.

Shared Use Path: A facility physically separated from motorized vehicular traffic by an open space or barrier and either within the road right-of-way or within an independent right-of-way. Shared Use Paths typically accommodate a variety of user groups, including pedestrians, in-line skaters, wheelchair users and other non-motorized users. Shared Use Paths in Ames typically have a minimum width of 8 feet and are surfaced with asphalt or portland cement concrete.

Sidewalk: The portion of a street or highway right-of-way designed for preferential or exclusive use by pedestrians. Typical sidewalk width is 4 feet.

Signed Shared Roadway: A shared roadway which has been designated by signing as a preferred route for bicycle use.

6.2.1 Public Input

In addition to interviews with public officials, the consultant attended meetings of advocacy groups to identify key issues related to bicycle facilities in Ames, including a regular meeting of the Friends of Central Iowa Bicycling Organization. Also, meetings of the City Council-created Sidewalk Focus Group and the Central Iowa Bicycle-Pedestrian Roundtable were monitored.

Important enhancements identified included:

- Providing adequate east-west bicycle facilities north of downtown. While north-south bicycle connections north of downtown are viewed as adequate with the designation of Clark and Northwestern Avenues as "shared roadways," east-west bicycle connections in the vicinity of 13th Street need to be improved.
- Providing adequate east-west bicycle facilities in the vicinity of Lincoln Way.
- Completing the Skunk River and Squaw Creek paths to expand opportunities for recreational bicycling.
- Improving connectivity to regional trail systems, including linking Ames to the Heart of Iowa Nature Trail (HOINT) via Elwood Drive, US 69 or the Skunk River.

6.2.2 Description of the Proposed System

This section describes proposed improvements to the Ames area's bicycle facilities, as well as phasing of the development program and costs of each component. The completed network should connect the city's neighborhoods, major community facilities, parks and the regional trail system. The eventual network, illustrated by Figure 6.1, will include additional shared use paths, bike lanes and signed shared roadways. These segments should be constructed through either the City's CIP process or by developers as part of planned project construction.

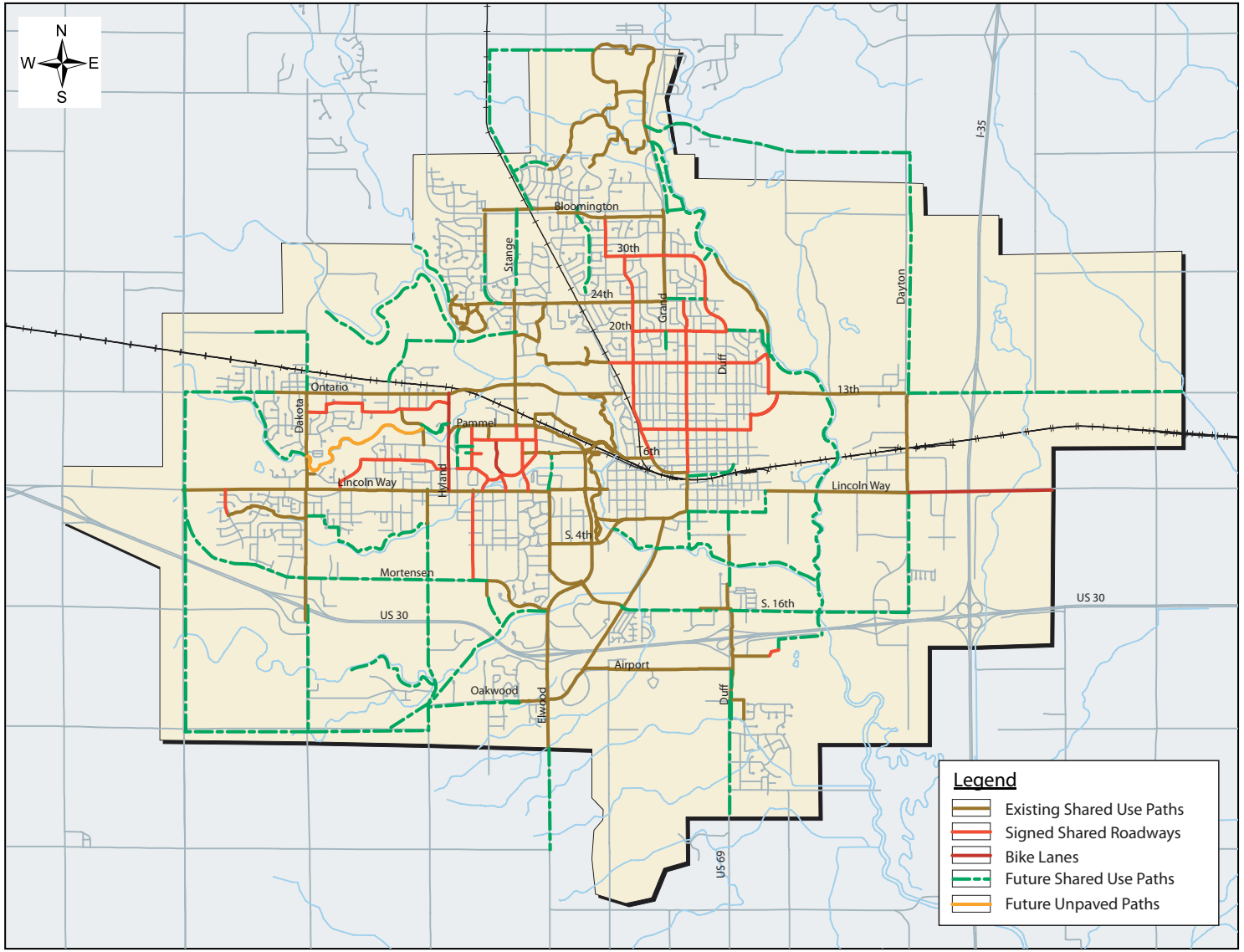


FIGURE 6.1 - EXISTING AND PLANNED BICYCLE FACILITIES

As shown on Figure 6.2, implementation should occur in three phases:

Phase I: This includes projects presently listed in the city's 5-year capital improvements program (CIP) and additional shared roadway designations. These components, outlined in Table 6.1, should be implemented within 5 years. These projects represent a total expenditure of $1,031,000 or an average of $206,200 per year. This five-year plan represents a continued focus on improving system continuity, extending shared use paths into newly-developing areas and a new emphasis on constructing the Skunk River path across the community as a major recreational amenity.

Major components of Phase I include:

- **The Skunk River Shared Use Path:** The city's CIP proposes a shared use path along the Skunk River from Ada Hayden Heritage Park to the Youth Sports Complex.
- **Shared Use Paths parallel to several arterial streets:** Other major CIP projects include the Elwood Drive path between the city limits and 260th Street, the South Duff path from Airport Road to Crystal Street, the Ontario Street path from Idaho to Kentucky Avenue, the State Avenue path from Squaw Creek to Mortensen Road, the Grand Avenue path between 20th Street and Murray Drive, the Walnut Avenue path between South 3rd Street and Squaw Creek and the Oakwood Road path from Green Hills Drive to White Oak Drive.
- **9th and 16th Street Shared Roadway Designations:** 9th Street is currently signed as a "Bicycle Friendly" street and should continue to be designated as a "Signed Shared Roadway." This designation should extend east the length of 9th Street, turn north on Maxwell, and then diagonally east through the municipal cemetery. 16th Street should also be designated as a Share the Road route between the existing path at the Union Pacific Railroad and Meadowlane Avenue via Carr Drive.

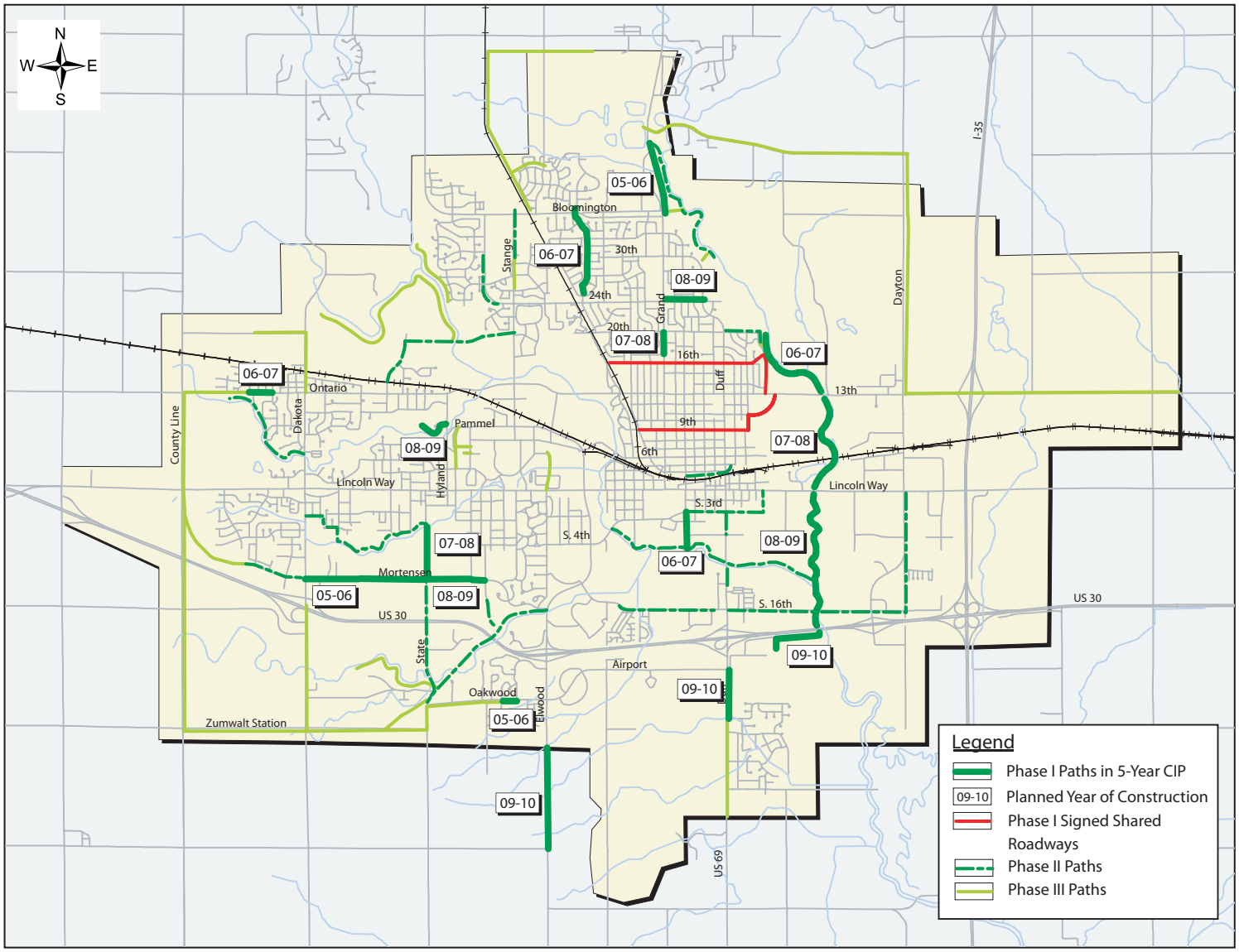


FIGURE 6.2 - PHASING OF BICYCLE FACILITIES

Priority	Facility	Limits	Side	Length (feet)	Type	Construction Cost	Year
I	Mortensen Rd.	South Dakota Ave. to Dotson Dr.	north	1,350	Shared Use Path	$55,000	2005/06
I	Oakwood Rd.	Green Hills Dr. to White Oak Dr.	south	700	Shared Use Path	$37,000	2005/06
I	Skunk River.	Ada Hayden Heritage Park to Top-O-Hollow Rd.	west	3,000	Shared Use Path	$93,000	2005/06
I	Ontario St.	Idaho Ave. to Kentucky Ave.	south	2,950	Shared Use Path	$43,000	2006/07
I	Parkview Park	Bloomington Rd. to 24th St.	-	4,200	Shared Use Path	$70,000	2006/07
I	Skunk River	Carr Pool to E. 13th St.	west	4,200	Shared Use Path	$71,000	2006/07
I	Walnut Ave.	S. 3rd St. to S. 5th St.	west	920	Shared Use Path	$65,000	2006/07
I	Grand Ave.	20th St. to Murray Dr.	west	1,050	Shared Use Path	$45,000	2005/06
I	Skunk River.	E. 13th St. to Lincoln Way	west	5,000	Shared Use Path	$80,000	2007/08
I	State Ave.	College Creek to Mortensen Rd.	east	2,350	Shared Use Path	$105,000	2008/09
I	24th St.	Grand Ave. to Duff Ave.	south	1,700	Shared Use Path	$55,000	2008/09
I	Skunk River	Lincoln Way to SE 16th St.	west	5,900	Shared Use Path	$75,000	2008/09
I	Elwood Dr.	city limits to 260th St.	west	1,420	Shared Use Path	$60,000	2009/10
I	McCarthy Lee Park	Hyland Ave. to existing path	north	1,260	Shared Use Path	$20,000	2009/10
I	S. Duff Ave.	Airport Rd. to Crystal St.	east	2,150	Shared Use Path	$97,000	2009/10
I	Skunk River	SE 16th St to Youth Sports Complex	west	9,500	Shared Use Path	$60,000	2009/10
I	16th St.	Union Pacific RR to Carr Pool	-	-	Signed Shared Roadway	-	
I	9th St.	Northwestern Ave. to Maxwell Ave.	-	-	Signed Shared Roadway	-	
I	Carr Dr.	E. 16th St. to Meadowlane Ave.	-	-	Signed Shared Roadway	-	
I	Maxwell Ave.	E. 9th St. to E. 11th St.	-	-	Signed Shared Roadway	-	
	Total			**47,650**		**$1,031,000**	

TABLE 6.1 - PHASE I COMPONENTS

Phase II: Construction of Phase II facilities, listed in Table 6.2, will likely occur in more than 5 years, but within the 25-year horizon of this plan. Phase II includes about 17.1 miles of shared use paths and focuses on filling gaps in developed and developing areas of the city. It is estimated that construction costs an average of $40 per lineal foot. Based on the city's present annual spending level of about $220,000 on trail construction, Phase II represents a development program spanning over 15 years.

One major component of Phase II is a South 3rd Street shared use path. To avoid the congested downtown segment of Lincoln Way, the existing recreational path along north right-of-way of South 3rd Street should be extended east from Walnut Avenue. It should cross Duff at the signalized intersection at South 3rd Street, continue east alongside Target and then north to Cherry Avenue to connect to the Lincoln Way path between downtown and the Skunk River.

The plan also recommends that:

(1) the existing South Duff path be extended north to connect with this proposed South 3rd Street path,
(2) the Walnut Avenue path be extended south to connect with a proposed Squaw Creek trail and
(3) the South 5th Street path proposed in the 2000 Transportation Master Plan be eliminated because it parallels the Squaw Creek trail.

Because of congestion at the Duff Avenue railroad crossing, all bike traffic north of Lincoln Way should be directed to the Skunk River path either via the 9th Street shared roadway or the South 3rd Street path, crossing Lincoln Way at the Clark/Walnut Avenue intersection.

Facility	Limits	Side	Length (feet)	Type	Construction Cost
20th St.	Meadowlane Ave. to Duff Ave.	north	1,500	Shared Use Path	$60,000
Cherry Ave.	S. 3rd St. to Lincoln Way	east	950	Shared Use Path	$38,000
Clear Creek	North Dakota Ave. to Ontario St.	north	5,600	Shared Use Path	$224,000
Clear Creek	McCarthy Lee Park to North Dakota Ave.	north	7,150	Unpaved Path	-
College Creek	State Ave. to South Dakota Ave.	north	6,920	Shared Use Path	$276,800
Dayton Ave.	Lincoln Way to SE 16th St.	west	5,250	Shared Use Path	$210,000
G.W. Carver Ave.	24th St. to York Ave.	west	2,600	Shared Use Path	$104,000
Gateway Hills Park	Mortensen Rd. to Worle Creek	east	2,340	Shared Use Path	$93,600
Grand Ave.	Bloomington Rd. to city limits	west	3,000	Shared Use Path	$120,000
Meadowlane Ave.	20th St. to South River Valley Park enterance	east	1,220	Shared Use Path	$48,800
Mortensen Rd.	South Dakota Ave. to Miller Ave.	north	2,250	Shared Use Path	$90,000
Oakwood Rd.	White Oak Dr. to State Ave.	south	3,300	Shared Use Path	$132,000
Parking Lot	Clark Ave. to Bandshell Park	-	2,240	Shared Use Path	$89,600
S. 16th St.	Zumwalt Station Rd. to Golden Aspen Dr.	north	3,075	Shared Use Path	$123,000
S. 3rd St.	Walnut Ave. to Cherry Ave.	south	3,500	Shared Use Path	$140,000
S. Duff Ave.	Squaw Creek to Chestnut St.	east	800	Shared Use Path	$32,000
Scholl Rd.	Ontario St. to Spangler Lab	west	2,750	Shared Use Path	$110,000
SE 16th St.	S. Duff Ave. to S. Dayton Ave.	north	7,780	Shared Use Path	$311,200
Squaw Creek	S. 4th St. to Skunk River	north	9,720	Shared Use Path	$388,800
Stange Rd.	Northridge Pkwy. to Bloomington Rd.	east	2,750	Shared Use Path	$110,000
State Ave.	Mortensen Rd. to Oakwood Rd.	west	5,630	Shared Use Path	$225,200
Veenker Golf Course	Spangler Lab to Stange Rd.	-	4,765	Shared Use Path	$190,600
Worle Creek	Elwood Dr. to State Ave.	north	7,100	Shared Use Path	$284,000
Total			**90,180**		**$3,401,600**

TABLE 6.2 - PHASE II COMPONENTS

Phase III: Phase III includes proposed trail segments in presently undeveloped portions of Ames that will likely experience growth in the future. These segments, listed in Table 6.3, should be constructed as development occurs in these areas. Developers will likely pay for large portions of these segments.

Major components include new shared use paths along:

- County Line Road
- Zumwalt Station Road
- East Riverside Road
- Squaw Creek
- Onion Creek
- Union Pacific Railroad north of Bloomington Road

It also includes extensions of paths along East 13th Street, East Lincoln Way and Dayton Avenue as urban growth occurs in those areas.

Other Priorities: Linking Ames to the regional trail network, particularly the Heart of Iowa Nature Trail (HOINT), is an essential component of the bicycle facilities plan. Connecting the city to the HOINT would also link Ames to the Central Iowa Loop trail system and the American Discovery Trail. Although detailed analysis has not been completed, preliminary Story County plans propose using Elwood Drive (when paved to County Road E57) and then E57 and R38 south to Slater to connect to the HOINT. Another alternative involves widening Highway 69 to accommodate a trail between Ames and Huxley. Both alternatives are shown on Figure 6.1. Constructing a path along the Skunk River corridor is a less likely alternative given multiplicity of ownership and the better geographic location of the Elwood and Highway 69 corridors as connections to the HOINT.

6.2.3 Bicycle Facilities Maintenance

The undertaking of a community-wide shared use path system represents a substantial ongoing operating expense. There is a tendency for a community to focus on the initial capital construction costs of shared use paths. However, the ongoing operating budget expense of clearing the path, mowing, patching and snow removal should also be considered. For the typical four-foot public sidewalk located in the front right-of-way of properties, construction and maintenance costs are the responsibility of the property owner. However, the increased width and public purpose of shared use paths typically are considered adequate justification for public maintenance of these systems.

Off-street shared use paths in Ames can be considered to be in one of two categories:

- Paths included in the city's "Official System" that are determined to be critical elements of the city-wide system to provide for continuity of pedestrian and bicycle movement.
- Additional paths, both widened public sidewalks in the front rights-of-way and backyard trails that may be constructed as amenities to specific projects. While serving as project and even subarea amenities, these paths are not deemed to be critical parts of the city-wide system needed to provide for continuity of movement.

Facility	Limits	Side	Length (feet)	Type	Construction Cost
13th St.	Dayton Ave. to I-35	north	2,900	Shared Use Path	$116,000
13th St.	I-35 to AAMPO boundary	north	9,200	Shared Use Path	$368,000
215th St.	North Dakota Ave. to future park	south	2,090	Shared Use Path	$83,600
County Line Rd.	Ontario St. to Lincoln Way	east	4,245	Shared Use Path	$169,800
County Line Rd.	Lincoln Way to Zumwalt Station Rd.	east	10,560	Shared Use Path	$422,400
Dayton Ave.	E. Riverside Dr. to E. 13th St.	west	10,650	Shared Use Path	$426,000
E. Riverside Rd.	Grand Ave. to Dayton Ave.	north	11,900	Shared Use Path	$476,000
Mortensen Rd.	Miller Ave. to County Line Rd.	north	4,720	Shared Use Path	$188,800
North Dakota Ave.	Ontario St. to 215th St.	east	2,575	Shared Use Path	$103,000
Ontario St.	Kentucky Ave. to County Line Rd.	south	2,950	Shared Use Path	$118,000
Onion Creek	Moore Memorial Park to future park	south	11,290	Shared Use Path	$451,600
South Dakota Ave.	U.S. 30 to Zumwalt Station Rd.	west	4,700	Shared Use Path	$188,000
S. Duff Ave.	Crystal St. to AAMPO Boundary	east	4,350	Shared Use Path	$174,000
South of 190th St.	Union Pacific NW line to Hallett's Quarry	-	4,650	Shared Use Path	$186,000
Squaw Creek	Moore Memorial Park to city limits	east	4,700	Shared Use Path	$188,000
State Ave.	Oakwood Rd. to Zumwalt Station Rd.	east	1000	Shared Use Path	$40,000
Union Pacific NW line	Bloomington Rd. south of 190th St.	east	7,550	Shared Use Path	$302,000
Worle Creek	State Ave. to South Dakota Ave.	south	6,550	Shared Use Path	$262,000
Worle Creek	State Ave. to Zumwalt Station Rd.	-	2,200	Shared Use Path	$88,000
Zumwalt Station Rd.	State Ave. to County Line Rd.	north	10,520	Shared Use Path	$420,800
Total			**119,300**		**$4,772,000**

TABLE 6.3 - PHASE III COMPONENTS

It is recommended that Figure 6.1: Existing and Planned Bicycle Facilities, be designated as the city's "Official Shared Use Paths" map and that only paths identified on that map be identified for public maintenance responsibilities. It should be noted that some shared use paths, used primarily for recreation and typically on the fringes of the City of Ames, would not have snow removal services. These paths are illustrated in Figure 6.3. Shared use paths used for travel to work and along the major routes are to have snow removal services. Additional paths in the city should be considered private amenities and it should be the responsibility of adjacent property owners or property owners' associations to maintain these facilities.

Annual average shared use path maintenance costs were calculated and include the following:

- Mowing – six feet on each side of the path every seven to ten days
- Sweeping – occurs once a year in the fall
- Snow removal (if appropriate) – assume six times per year

An average cost of $1,290 per mile was used for paths that have snow removal services. An average cost of $1,125 per mile was used for paths that do not have snow removal services.

The following are the approximate shared use path maintenance costs:

- Existing Shared Use Paths
  - With snow removal services = 34.0 miles x $1,290 = $43,860
  - Without snow removal services = 8.5 miles x $1,125 = $ 9,560

    $53,420/year
- Future Shared Use Paths
  - With snow removal services = 32.5 miles x $1,290 = $41,930
  - Without snow removal services = 17.0 miles x $1,125 = $19,130

    $61,060/year

Most shared use paths require regular maintenance. Because of costs, snow removal is limited to those paths along major routes to work, shopping and commercial areas.

The shared use path maintenance costs are paid for from the General Fund. The existing shared use path annual maintenance cost of $53,420 represents less than one percent of the current General Fund for the City of Ames. The future year shared use paths would increase maintenance costs by three percent per year, bringing the total annual maintenance cost to $114,480 in 2030.

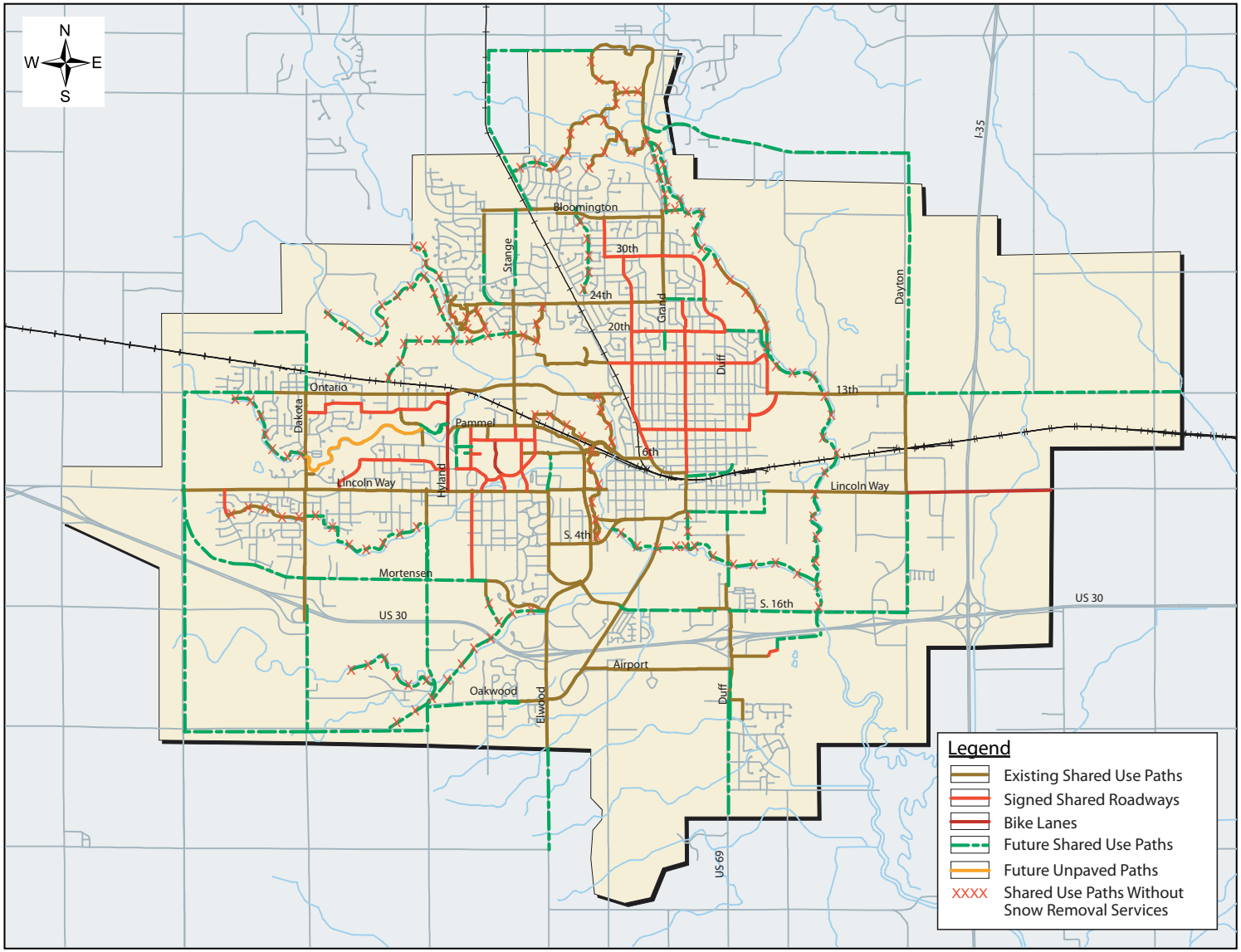


FIGURE 6.3 - SHARED USE PATHS WITHOUT SNOW REMOVAL SERVICES

6.3 Pedestrian Facilities Plan

As established in the 2000 Transportation Master Plan, the components of the pedestrian plan for Ames include:

1. Improved pedestrian system continuity in existing areas of the city. Priorities should be given to arterial and collector streets where physical separation of pedestrians and motor vehicles is of utmost concern. It should be noted that for sidewalk improvements in existing residential areas, city policy requires a petition from local property owners; the costs of these improvements are typically borne by the adjacent property owner(s).
2. Extension of the pedestrian system into all new subdivisions to ensure system continuity. This requirement is enforced through the city's Subdivision Ordinance, which requires installation of four-foot concrete sidewalks on both sides of new streets in commercially and residentially zoned districts and one side of new streets in industrial areas.
3. Inclusion of pedestrian facilities as part of roadway improvement projects including widenings, extensions or pavement reconstruction. In particular, provision of pedestrian facilities should be made with bridge improvements.

Ames has an extensive shared use path system to augment standard sidewalks. Opinion surveys indicate many citizens would like the trail system expanded.

4. Pedestrian street crossing improvements related to:
   - Pedestrian "walk" and clearance times set in traffic signal timing/phasing programs
   - Installation of crosswalks where none are present and pedestrian activity occurs
   - Provision of islands in wide intersections to provide refuge for pedestrians
   - Increased crosswalk visibility through better signing, pavement markings and lighting
5. Improved physical facilities through annual maintenance of existing facilities and upgrading of existing facilities to meet handicapped access standards
6. Pedestrian safety education

These pedestrian system components are consistent with the city's LUPP goals of providing greater mobility and creating a greater sense of place and connectivity, as well as the goals of this plan.

The City of Ames is currently studying the issue of sidewalk construction priorities in developed areas. As recommended in the 2000 Transportation Master Plan, the City undertook a detailed pedestrian system analysis to identify locations with sidewalk deficiencies. A preliminary report proposed an extensive set of criteria for determining construction priorities. A citizen focus group has been created by Council to review the sidewalk construction priorities issue and make recommendations on a plan. The Pedestrian Walkway Advisory Committee was created to solicit public input on a planned sidewalk improvement program, as recommended in the 2000 Transportation Plan.

The Pedestrian Walkway Advisory Committee has begun to focus on a narrower set of criteria more closely related to pedestrian safety and convenience. As indicated in pedestrian plan component No. 1 above, the city should focus on correcting sidewalk discontinuities along arterial streets

and bus routes. Figure 6.4 identifies sidewalk deficiencies along arterial streets in Ames. These segments, listed in Table 6.4, should be the first priority for construction. Figure 6.5 illustrates sidewalk deficiencies along and near bus routes. The Advisory Committee's recommended program does not include these segments.

Completion of sidewalks along both sides of each deficient arterial street segment (one side adjacent to industrial land uses) represents about 18.7 miles of sidewalk. Assuming an average of $18 per lineal foot, total construction costs are estimated at $1,777,248. These costs represent the installation costs and do not include enhancements.

Street	Segment	Side	Dirt Path Existing	Sidewalk One Side	Within 2 blocks of Public School	Adjacent Use
13th St.	Carroll Ave. to Meadowlane Ave.	south	No	Yes	No	Residential
13th St.	Kellogg Ave. to 1227 Burnett Ave.	south	No	Yes	No	Residential
13th St.	Meadowlane Ave. to Skunk River Bridge	south	No	Yes	No	Commercial
24th St.	Pedestrian Crossing to U.P. Railroad	north	No	Yes	No	Residential
Airport Rd.	North Loop Dr to Elwood Dr.	south	No	Yes	No	Industrial
Airport Rd.	Duff Ave. to S. Riverside Dr.	south	No	Yes	No	Commercial
Bloomington Rd.	Eisenhower Ave. to George W. Carver Ave.	-	No	No	No	Residential
Bloomington Rd.	300' east of Eisenhower Ave. to Top-O-Hollow Rd.	north	No	Yes	No	Residential
Bloomington Rd.	Roy Key Ave. to Grand Ave.	north	No	Yes	No	Residential
Bloomington Rd.	Top-O-Hollow Rd. to Hoover Ave.	north	No	Yes	No	Residential
Bloomington Rd.	Hoover Ave. to Roy Key Ave.	north	No	Yes	No	Residential
Bloomington Rd.	George W. Carver Ave. to Harrison Rd.	-	No	Yes	No	Residential
Dayton Ave.	Lincoln Way to 13th St.	west	No	Yes	No	Industrial
Elwood Dr.	Lincoln Way to 6th St.	east	Yes	Yes	Yes	Residential

TABLE 6.4 - EXISTING SIDEWALK DEFICIENCIES ON ARTERIAL STREETS

Street	Segment	Side	Dirt Path Existing	Sidewalk One Side	Within 2 blocks of Public School	Adjacent Use
Elwood Dr.	S. 4th St. to U.S. Highway 30	east	No	Yes	Yes	Government
Elwood Dr.	U.S. Highway 30 to Airport Rd.	east	No	Yes	Yes	Commercial
Grand Ave.	Murray Dr. to 20th St.	east	No	Yes	No	Residential
Grand Ave.	2707 Luther Dr. to 30th St.	east	No	No	Yes	Residential
Grand Ave.	30th St. to Northwood Dr.	east	No	Yes	Yes	Commercial
Grand Ave.	Northwood Dr. to Bloomington Rd.	east	No	Yes	Yes	Commercial
Grand Ave.	15th St. to Murray Dr.	east	No	Yes	No	Residential
Grand Ave.	20th St. to 24th St.	east	No	Yes	No	Residential
Lincoln Way	North Dakota Ave. to Marshall Ave.	north	Yes	Yes	No	Residential
Mortensen Rd.	South Dakota Ave. to Welch Ave.	north	Yes	No	Yes	Residential
Mortensen Rd.	South Dakota Ave. to Elwood Dr.	south	Yes	Yes	No	Residential
North Dakota Ave.	Castlewood Pl. to Reliable St.	west	No	Yes	Yes	Residential
North Dakota Ave.	Ontario St. to 225' North of Delaware Ave.	west	No	Yes	No	Residential
North Dakota Ave.	Delaware Ave. to 225' North of Westbend Dr.	west	No	Yes	No	Residential
North Dakota Ave.	Lincoln Way to 230' south of Westbend Dr.	west	No	Yes	No	Residential
Oakwood Rd.	Elwood Dr. to State St.	-	No	No	No	Residential
Ontario St.	2905 Ontario Rd. to Hyland Ave.	north	No	Yes	No	Residential
Ontario St.	Minnesota Ave. to Garfield Ave.	north	No	Yes	No	Residential
S. 16th St.	375' west of Golden Aspen Dr. to 175' west of Apple Pl.	-	No	No	No	Commercial
S. 16th St.	Duff Ave. to 375' west of Golden Aspen Dr.	-	No	Yes	No	Commercial
S. 16th St.	Elwood Dr. to Apple Pl.	north	Yes	Yes	Yes	Government
S. 3rd St.	S. Walnut Ave. to S. 4th St.	south	No	Yes	No	Commercial
S. Dayton Ave.	Lincoln Way to S. 16th St.	-	No	No	No	Industrial
S. Duff Ave.	Ken Maril Rd. to Airport Rd.	-	No	No	No	Commercial
South Dakota Ave.	Lincoln Way to 400 South Dakota Ave.	east	No	Yes	No	Residential
State Ave.	Arbor St. to Mortensen Pkwy.	-	No	No	No	Residential

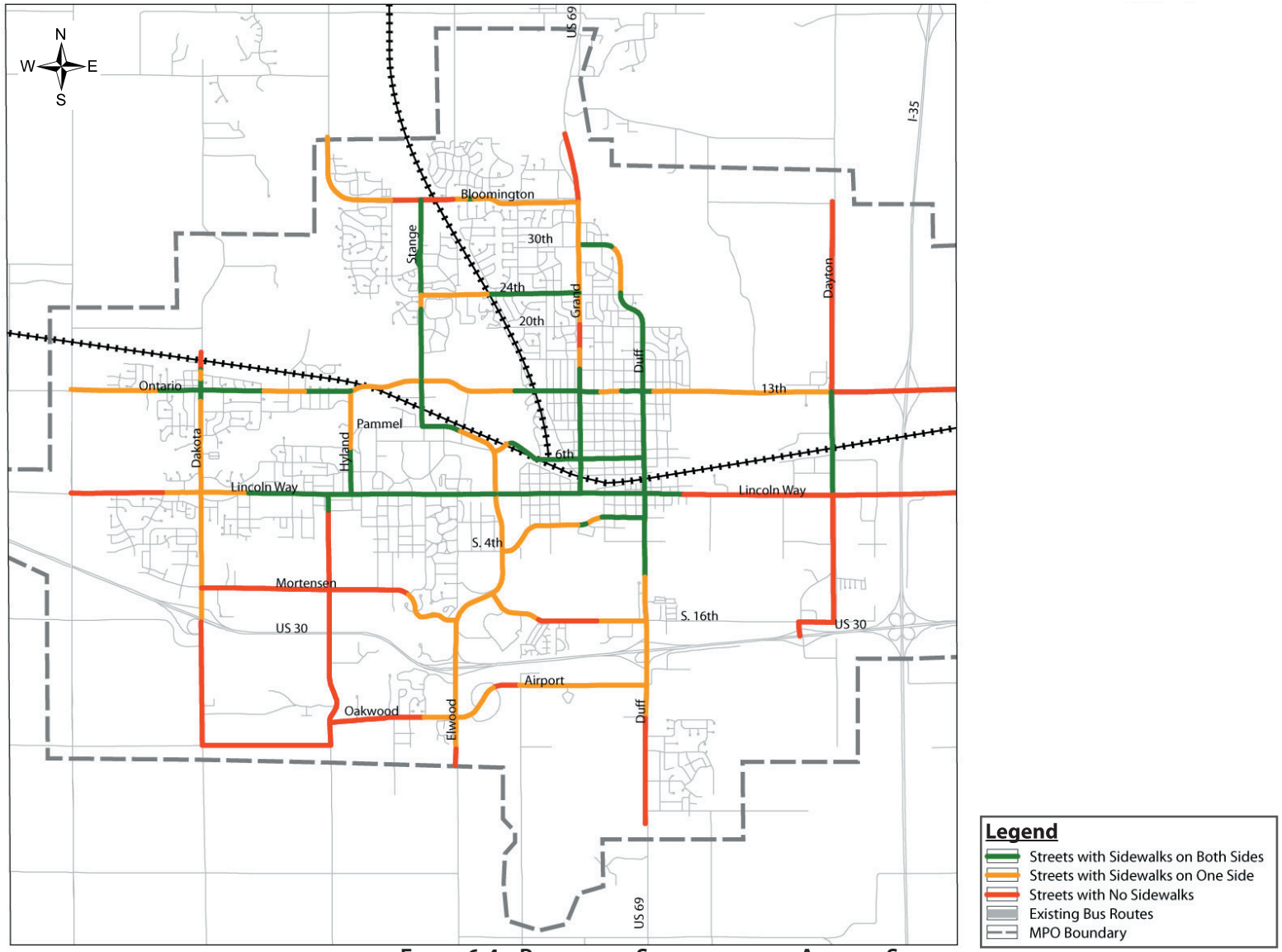


FIGURE 6.4 - PRESENCE OF SIDEWALKS ALONG ARTERIAL STREETS

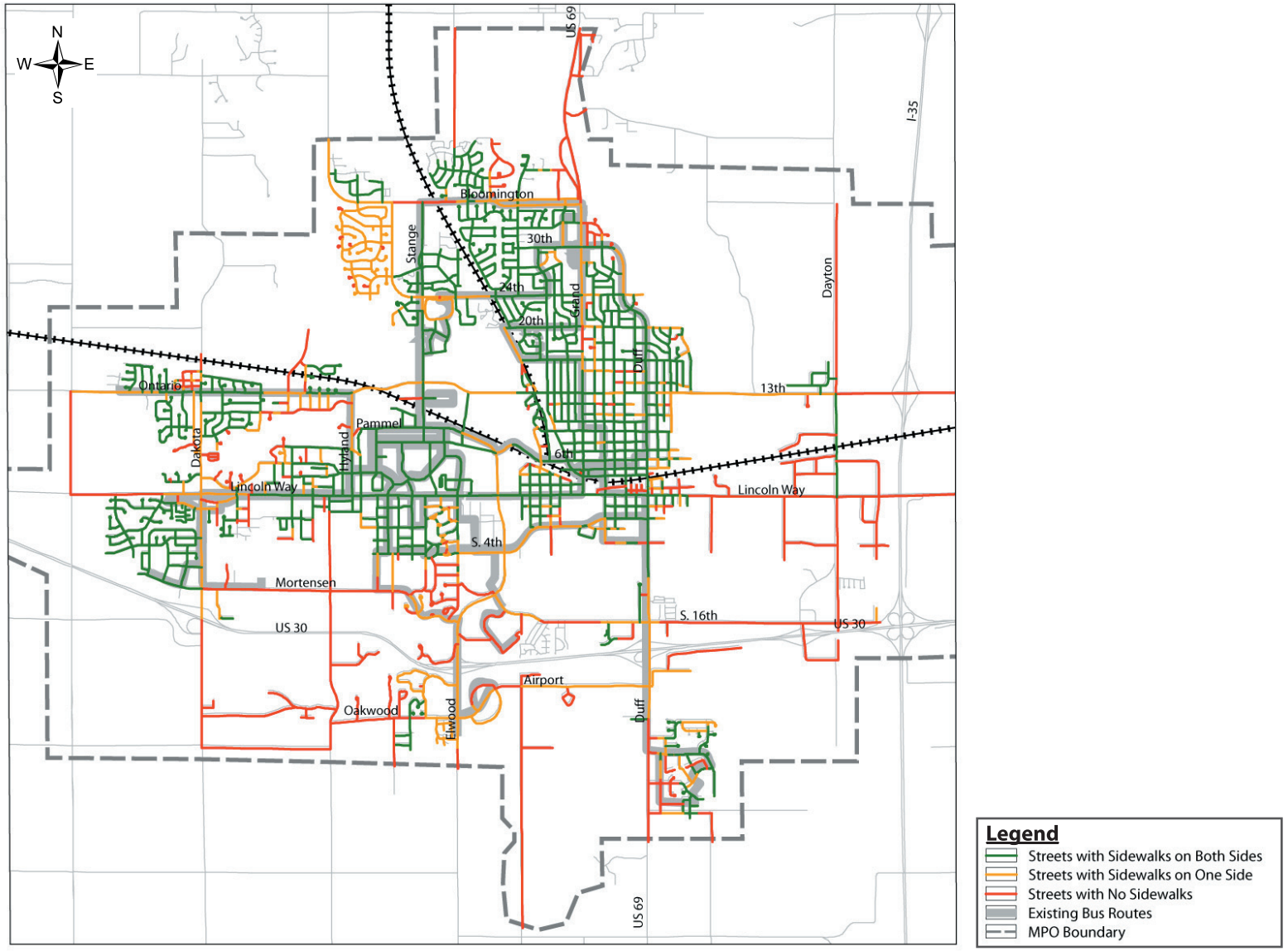


FIGURE 6.5 - PRESENCE OF SIDEWALKS NEAR BUS ROUTES

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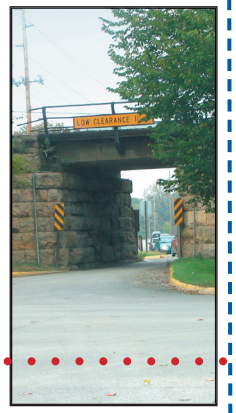
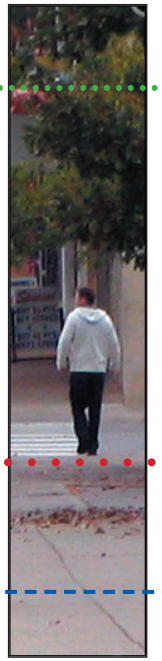
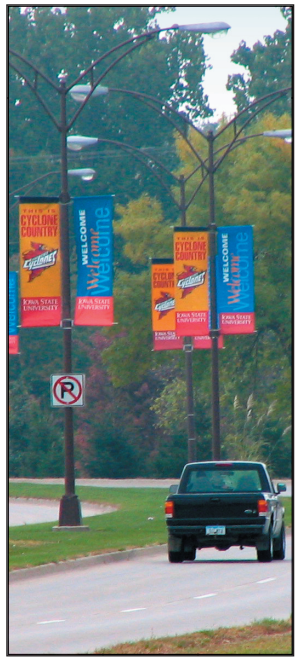
Section 7







HWS

Solutions Through Service

This element of the Ames Area Long Range Transportation Plan develops a short and long-range strategy for effective, economical transit service for the area. The Ames Area Transit Authority, or CyRide, has traditionally had one of the highest per capita ridership levels in Iowa, playing an important role for specific markets. In order to provide an acceptable level of mobility to all people in the area, Ames will continue to expand its transit service as growth occurs. In addition, because transit's role in a balanced transportation system will likely increase in the future, service expansions and improvements will become critical in the coming years. This chapter offers short- and long-range recommendations for improving transit service in the Ames area.

7.1 Existing Service Evaluation

7.1.1 Service Configuration

CyRide, Ames' bus system, operates 9 fixed routes on weekdays and scaled-back service on weekends radiating from the ISU campus. Two routes, the Cardinal and Gold routes, operate solely on the ISU campus as circulator routes. CyRide also operates Dial-A-Ride service for the disabled, Moonlight Express late-night service for students on Friday and Saturday nights and shuttle service to the Des Moines International Airport. Figure 7.1 displays the CyRide fixed route system.

Table 7.1 shows headways and hours of operation for each of the fixed routes.

Route	Hours of Operation	Days	Hours per Week	General Headways (Peak/Off-Peak)
WEEKDAYS				
Red	6:25 am -12:30 pm	Monday - Thursday	18	20 min./30-40 min.
	6:25 am - 10:30 pm	Friday	16.5	
Green	6:25 am - 12:00 pm	Monday - Thursday	18	20 min./30-40 min.
	6:25 am - 10:30 pm	Friday	16.5	
Blue	6:25 am - 12:00 pm	Monday - Thursday	18	20 min./30-40 min.
	6:25 am - 10:30 pm	Friday	16.5	
Yellow	6:45 am - 6:20 pm	Monday - Friday	11.5	30 min.
Brown	6:30 am - 7:00 pm	Monday - Friday	12.5	20 min./30 min.
Purple	7:00 am - 6:15 pm	Monday - Friday	11	30 min./60 min.
Cardinal	7:30 am - 10:15 pm	Monday - Thursday	14.5	10 min./20 min. evening
	7:30 am - 5:15 pm	Friday	11.5	10 min.
Gold	7:00 am - 10:00 pm	Monday - Thursday	15	20 min./20 min. evening
	7:00 am - 5:30 pm	Friday	10.5	20 min.
Orange	6:30 am - 10: 20 pm	Monday - Thursday	16	20 min./20 min.
	6:30 am - 6:50 pm	Friday	12.5	20 min.
WEEKEND				
Red	7:20 am - 10:50 pm	Saturday	15.5	20 min./30-40 min.
Green	7:50 am - 11:05 pm	Saturday	15	40 min./70 min.
Blue	7:20 am - 10:50 pm	Saturday	15	20 min./40-70 min.
Yellow	8:45 am - 6:15 pm	Saturday	9.5	30 min.
Red	9:00 am - 11:25 pm	Sunday	14.5	30-40 min./70 min.
Green	8:45 am - 11:25 pm	Sunday	14.5	40 min./70 min.
Blue	9:00 am - 11:25 pm	Sunday	14.5	30-40 min./70 min.

TABLE 7.1 - CYRIDE ROUTE SCHEDULES, 2004-2005 SCHOOL YEAR

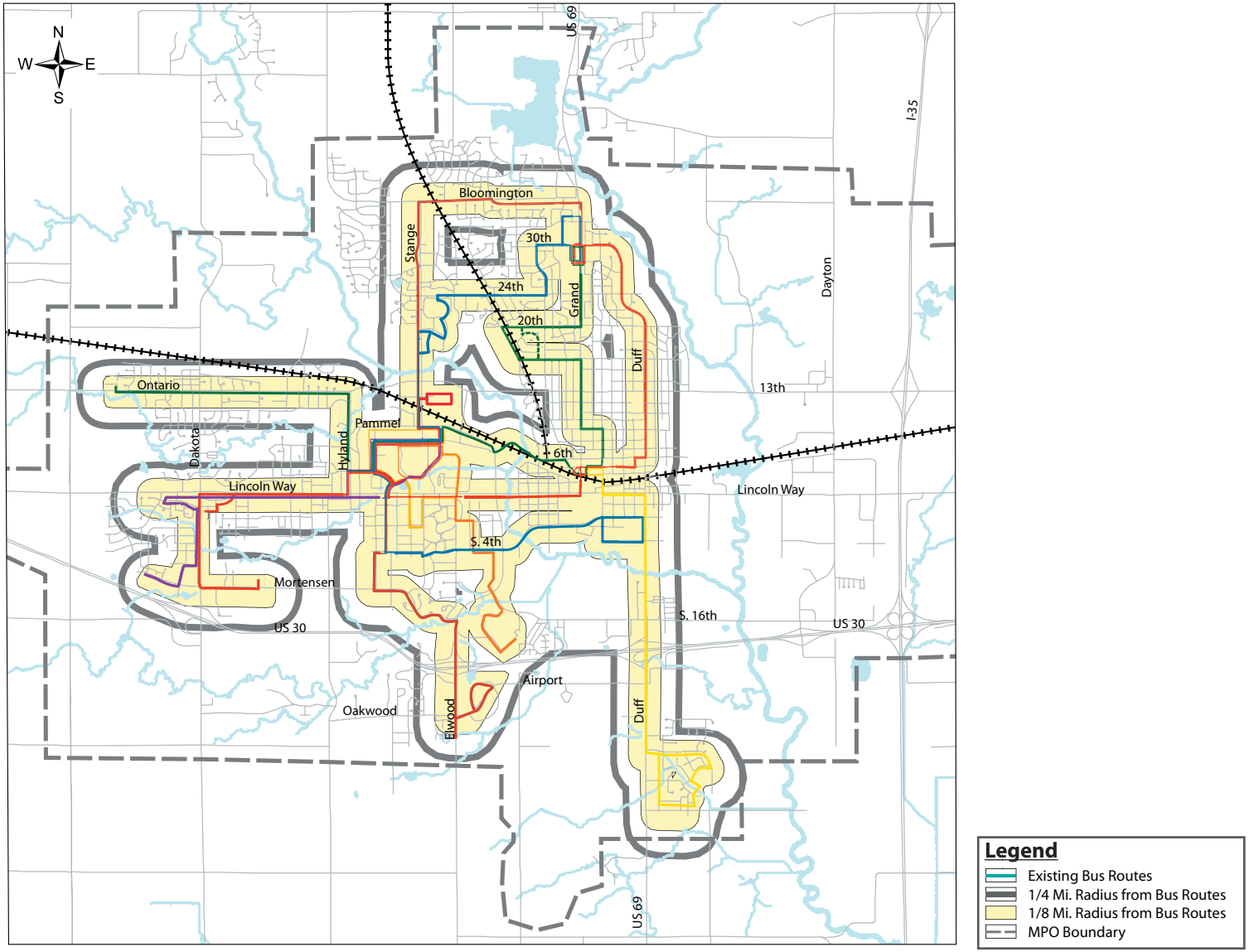


FIGURE 7.1 - EXISTING BUS ROUTES AND SERVICE AREAS

7.1.2 Service Availability

The CyRide system's availability can be examined by looking at the geographic areas it serves. This analysis includes proximity of the routes to land uses with significant trip origins and destinations, such as residential areas, employment centers, business districts, schools and hospitals. It also examines each route's proximity to areas with higher percentages of transit dependent persons. Transit dependency is a function of a variety of factors, including automobile availability, household income, age and health. A transit route generally serves areas within a ¼ mile radius. However, because many people are willing to walk only one or two blocks to a bus stop, a ¼ mile distance is inadequate in areas generating high transit usage.

Household Income. Figure 7.2 displays the percentage of households with annual incomes of less than $25,000 by Census block group. College students residing in dormitories are not considered as part of a household and are excluded from these figures. Areas with particularly high concentrations of low-income households include:

- Along Lincoln Way west of the ISU campus to Dakota Avenue.
- The Campustown area immediately south of the campus.
- South of the Union Pacific Railroad between Squaw Creek and Duff Avenue.
- The east side of Stange Road between 13th and 24th Streets.
- The North Grand Mall area.

Nearly all of these areas lie within ¼ mile of a bus line, except for a small area along Woodland Avenue west of Dakota Avenue. While several portions of these block groups appear underserved based on a 1/8 mile radius, bus routes adequately serve specific land uses, such as large apartment complexes, that generate a large number of transit users.

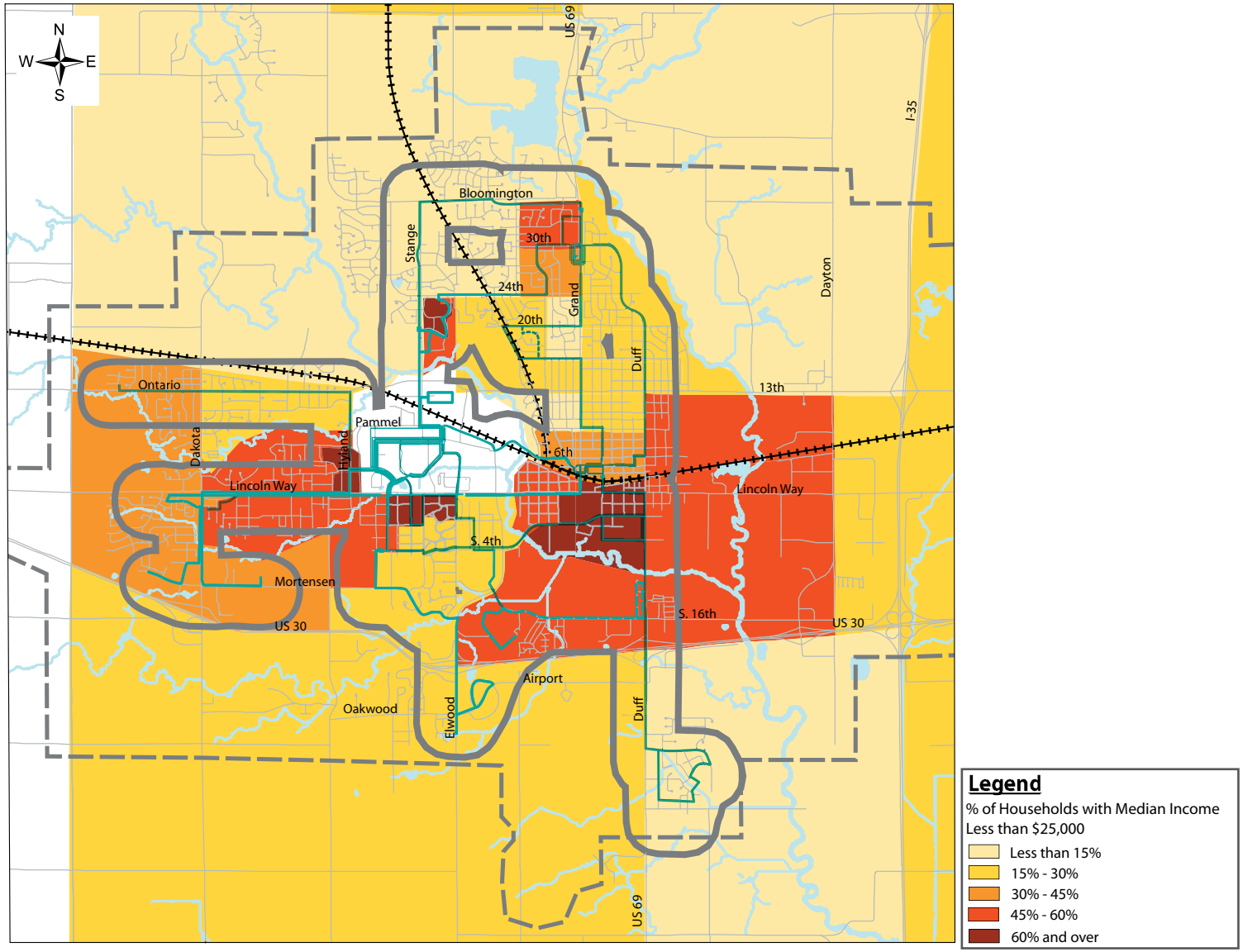


FIGURE 7.2 - PERCENTAGE OF HOUSEHOLDS WITH MEDIAN INCOME LESS THAN $25,000

Age. Figure 7.3 shows areas with high concentrations of elderly residents. Areas with particularly high proportions of elderly residents include:

- Residential areas on the City's north side, generally between 13th and 24th Streets in either direction of Grand Avenue, as well as near the North Grand Mall.
- The Northcrest retirement complex on 20th Street west of the Union Pacific railroad.
- The Green Hills condominium complex west of Elwood Drive and south of Highway 30.

The Green Hills area south of Highway 30 containing concentrations of elderly residents does not receive fixed-route transit service.

Rental Housing Concentrations. Figure 7.3 also presents the distribution of rental housing throughout Ames. Rental housing, and particularly multi-family housing, generates a substantial number of transit users. Transit trips comprise as much as 15% of the total number of trips generated by multi-family housing. Major concentration of apartments and rental housing include:

- Immediately west and south of the ISU campus.
- Along South Dakota Avenue north of Highway 30.
- Near the intersection of North Dakota Avenue and Ontario Street.
- Near North Grand Mall.
- South of Lincoln Way between Duff Avenue and Squaw Creek.
- Immediately north of downtown.

Existing bus routes serve all of these areas.

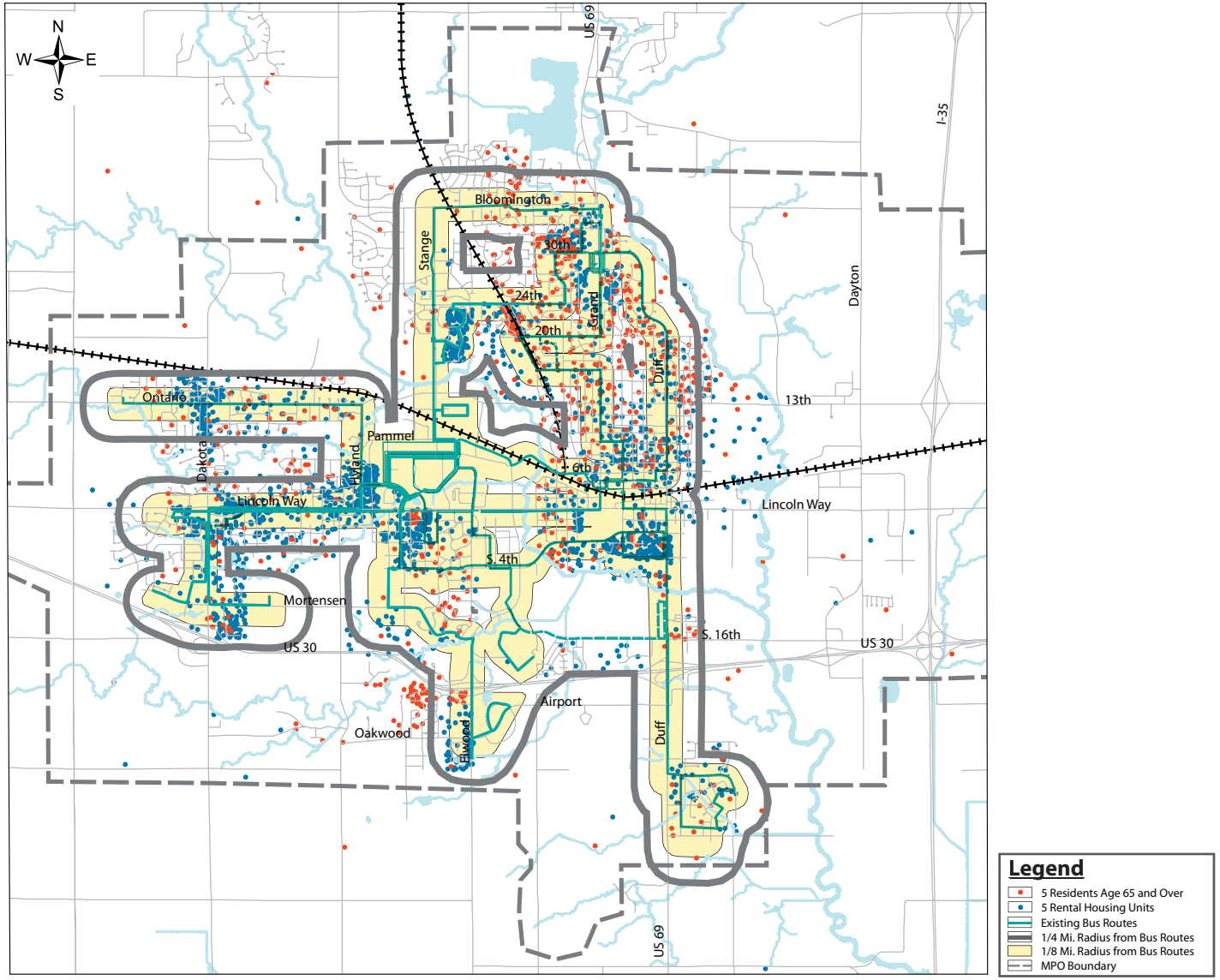
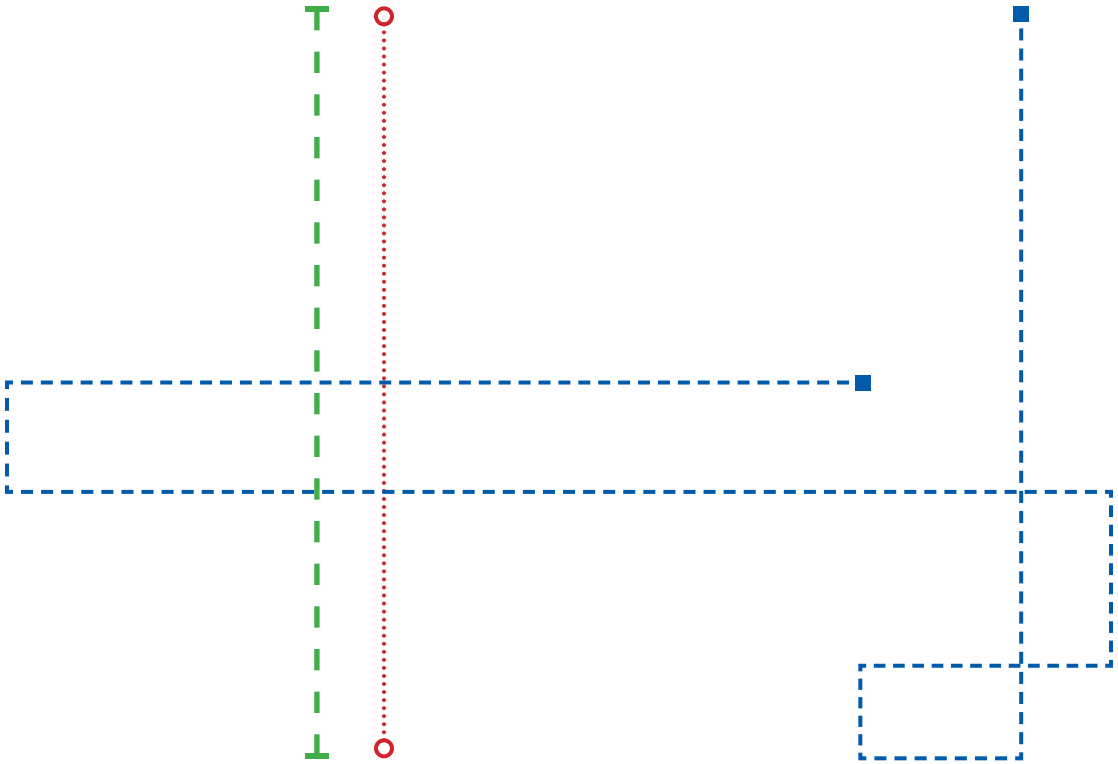


FIGURE 7.3 - ELDERLY RESIDENTS AND RENTAL HOUSING

Automobile Availability. Figure 7.4 displays the number of automobiles per 1,000 residents in each block group. Areas with relatively low automobile availability include:

- South of the ISU campus, or an area bounded by Lincoln Way, Elwood Drive, Mortensen Road and State Avenue.
- The downtown area north of the Union Pacific Railroad tracks, between Duff and Grand Avenues.
- The North Grand Mall area along the west side of Grand Avenue between 24th Street and Bloomington Road.

All of these areas appear adequately served by transit, with several bus routes serving each area.



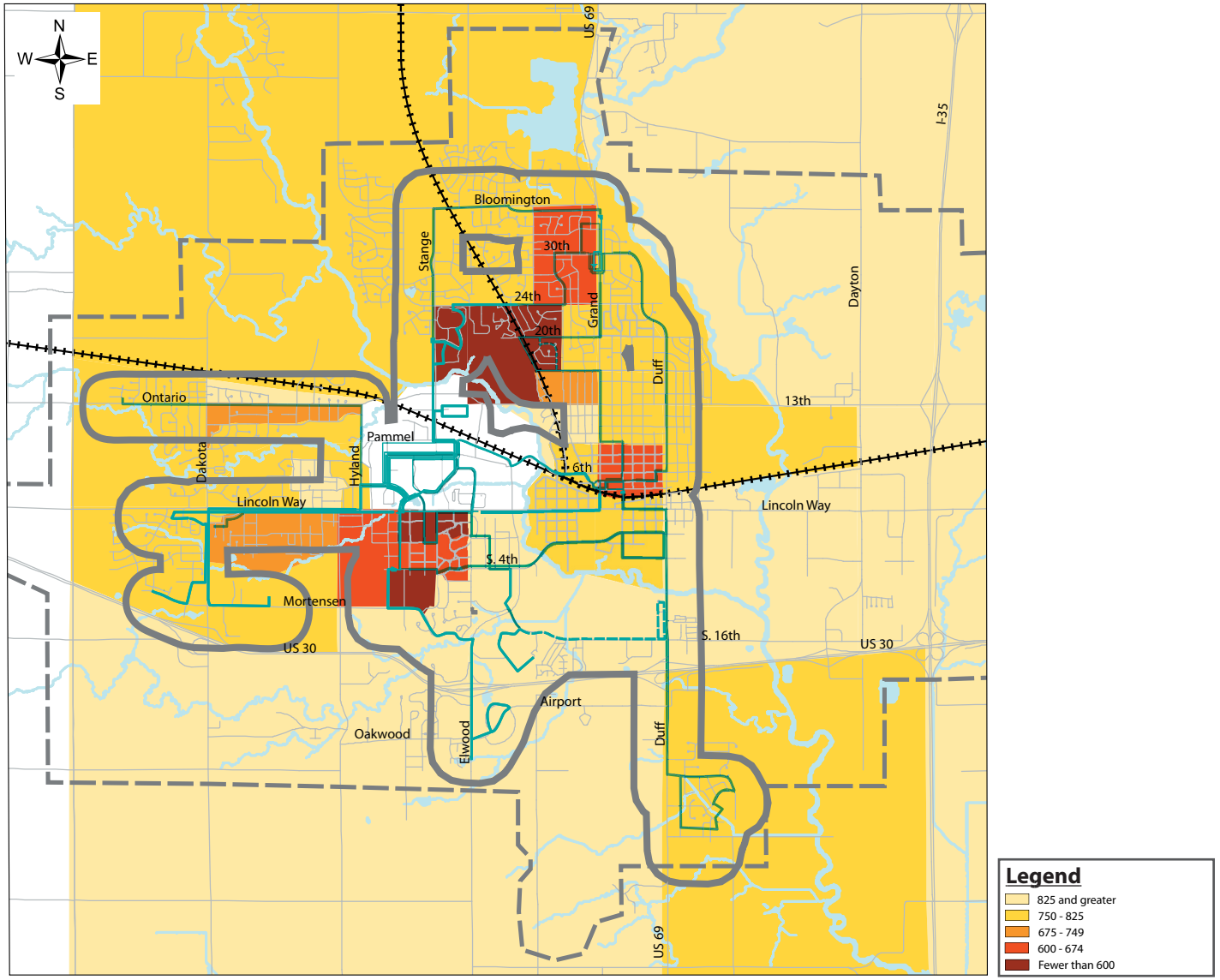


FIGURE 7.4 - NUMBER OF AUTOMOBILES PER 1,000 RESIDENTS

7.1.3 Ridership

Ridership Trends. Table 7.2 presents changes in ridership levels for each CyRide route from 1996 to 2004. The Red, Blue, Silver, Brown and Orange routes gained passengers in the past year, while the Yellow, Green, Cardinal, Gold and Purple routes lost riders. Because the Red and Purple routes west of the ISU campus largely duplicate one another, the Red route's gains cancel out the Purple route's recent losses.

Table 7.3 shows trends in the number of passengers per revenue hour during the period. CyRide considers a route not viable if passenger loads drop below 6 passengers per hour. Ridership on the Yellow route has fallen close to this level, largely due to an aging population in the Southdale area.

Routes	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	% Change 2003-04
Red	488,686	499,894	475,635	450,876	459,331	425,487	628,428	747,062	18.9%
Green	432,124	416,284	398,690	393,956	383,644	347,077	465,028	461,186	-0.8%
Blue	532,319	503,684	509,509	507,548	578,026	543,335	811,632	842,409	3.8%
Orange	793,559	782,488	779,641	864,428	907,554	1,280,347	1,559,871	1,637,368	5.0%
Yellow	22,463	24,645	23,648	24,100	28,749	25,870	26,554	21,879	-17.6%
Brown	310,856	345,914	394,675	389,835	465,782	449,364	243,947	262,413	7.6%
Purple	94,496	94,372	95,659	93,979	94,695	130,222	108,428	97,297	-10.3%
Gray	0	27,369	30,292	50,092	63,291	79,401	-	-	-
Cardinal							656,118	535,856	-18.3%
Gold						63,084	74,962	74,490	-0.6%
Silver						1,283	1,727	1,851	7.2%
Dial-a-Ride	17,247	17,548	16,590	14,188	14,857	13,674	13,703	13,347	-2.6%
Moonlight	16,367	19,138	25,651	26,653	24,687	33,782	37,292	46,329	24.2%
Total	2,708,117	2,731,336	2,749,990	2,815,655	3,020,616	3,392,926	4,627,690	4,741,487	2.5%

TABLE 7.2 - ANNUAL CYRIDE RIDERSHIP BY ROUTE (AUGUST TO AUGUST)

Routes	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	% Change 2003-04
Red	31.1	29.4	27.5	26.5	24.9	32.4	35.8	10.5%
Green	27.4	26.1	25.7	24.6	22.4	29.9	29.5	-1.1%
Blue	32.2	31.9	31.7	33.8	31.8	45.8	44.4	-3.1%
Orange	83.0	79.8	84.9	86.8	103.6	98.6	93.3	-5.4%
Yellow	10.0	8.0	8.2	9.6	8.1	8.2	7.3	-11.2%
Brown	81.1	75.0	75.5	85.7	79.1	28.8	30.8	6.8%
Purple	34.2	34.2	33.4	33.0	33.3	34.2	32.6	-4.7%
Gray	86.1	11.0	11.5	14.3	18.5			
Cardinal						95.0	83.5	-12.1%
Gold					45.2	33.3	33.6	0.7%
Silver					4.6	5.0	5.5	8.8%
Dial-a-Ride	2.5	2.3	2.0	1.9	2.0	2.7	2.7	-0.7%
Moonlight	18.7	20.3	22.6	22.4	26.0	21.8	21.7	-0.4%
Total	36.9	34.6	34.5	35.6	38.1	46.4	45.8	-1.4%

TABLE 7.3 - PASSENGERS PER REVENUE HOUR BY ROUTE (AUGUST TO AUGUST)

Peer Review. A nationwide peer review compares the CyRide's performance with other transit systems of similar size and with similar service characteristics, including system size, service area, climate and the presence of a university. Operating and financial data for this comparison were taken from the National Transit Database (NTD), 2003.

Table 7.4 presents basic characteristics of each peer system. While Ames has a relatively small population in comparison to its peers, its university population and number of vehicles available for service are moderate.

City	University	Area Population	University Population	Univ. Pop. as a % of Area Pop.	Vehicles Available for Max. Service
Bloomington, IN	Indiana University	92,456	29,383	31.8%	32
Champaign-Urbana, IL	University of Illinois	123,938	27,914	22.5%	89
Lafayette, IN	Purdue University	125,738	30,899	24.6%	59
Pocatello, ID	Idaho State University	62,496	14,786	23.7%	14
Santa Cruz, CA	University of California-Santa Cruz	147,348	11,616	7.9%	148
St. Cloud, MN	St. Cloud State University	91,305	13,942	15.3%	35
State College, PA	Penn State University	71,301	34,406	48.3%	55
Ames	Iowa State University	50,726	22,087	43.5%	57
Peer Average	-	95,664	23,129	27.2%	61
Ames Rank	-	8	5	2	4

Source: National Transit Database

TABLE 7.4 - SYSTEM CHARACTERISTICS, AMES AND NATIONAL PEERS

Table 7.5 examines the distribution of funding sources for CyRide and its peers. CyRide has a moderate overall budget and relies heavily on local funding sources in comparison to the peer systems. CyRide's percentages of funding from state and federal funding sources are about average. While the Champaign-Urbana system appears to rely heavily on state funding, it is possible that a portion of its federal funding is channeled through the state. Because student fares are channeled through Iowa State University, a local funding source, CyRide appears to rely heavily on local funding sources and receive very little funding from farebox revenues. Before student fares were covered in university tuition, Ames' reliance on farebox revenues was about average in relation to its peers.

System	Directly Generated Funds		Federal Funds		State Funds		Local Funds		Total
	Amount (in 1,000's)	% of Total	Amount (in 1,000's)	% of Total	Amount (in 1,000's)	% of Total	Amount (in 1,000's)	% of Total	
Bloomington, IN	1,084.7	27.4%	729.2	18.4%	1,051.4	26.5%	1,099.0	27.7%	3,964.3
Champaign-Urbana, IL	3,721.7	22.6%	66.4	0.4%	8,802.6	53.4%	3,879.8	23.6%	16,470.5
Lafayette, IN	1,919.2	29.9%	1,299.9	20.2%	2,015.9	31.4%	1,188.0	18.5%	6,423.0
Pocatello, ID	291.4	23.8%	522.7	42.8%	32.5	2.7%	375.3	30.7%	1,221.9
Santa Cruz, CA	22,193.0	75.6%	1,460.2	5.0%	113.9	0.4%	5,571.9	19.0%	29,339.0
St. Cloud, MN	595.6	11.6%	1,022.3	20.0%	3,502.4	68.4%	0.0	0.0%	5,120.3
State College, PA	3,142.5	49.9%	814.6	12.9%	1,992.9	31.6%	350.9	5.6%	6,300.9
Ames	494.7	10.5%	763.2	16.2%	351.4	7.5%	3,106.9	65.9%	4,716.2
Peer Average	4,180.4	31.4%	834.8	17.0%	2,232.9	27.7%	1,946.5	23.9%	9,194.5
% Difference between Ames and Peer Average	-745.0%	-199.5%	-9.4%	-4.9%	-535.4%	-272.2%	37.3%	63.8%	-95.0%
Ames Rank	7	8	5	5	6	6	3	1	6

Source: National Transit Database

TABLE 7.5 - FUNDING SOURCES, AMES AND NATIONAL PEERS, 2003

Table 7.6 compares CyRide's system performance to its national peers. While CyRide's overall ridership is about average in relation to its peers, its number of passengers per revenue hour and passengers per revenue mile are quite high. State College's system generally performs better than CyRide and Pocatello's and St. Cloud's systems do not perform as well. CyRide's high productivity is likely attributable to its high ratio of college students to total population.

System	Unlinked Passenger Trips	Trips Per Capita	Revenue Hours	Revenue Miles	Passengers per Revenue Hour	Passengers per Revenue Mile
Bloomington, IN	2,070,100	22.4	86,800	932,700	23.8	2.2
Champaign-Urbana, IL	9,355,800	75.5	243,100	2,771,100	38.5	3.4
Lafayette, IN	3,910,100	31.1	117,900	1,420,900	33.2	2.8
Pocatello, ID	489,700	7.8	39,200	465,100	12.5	1.1
Santa Cruz, CA	6,242,300	42.4	284,100	3,983,600	22.0	1.6
St. Cloud, MN	1,659,200	18.2	100,800	1,366,700	16.5	1.2
State College, PA	6,075,200	85.2	111,000	1,151,700	54.7	5.3
Ames	4,692,300	92.5	101,200	1,096,500	46.4	4.3
Peer Average	4,311,838	46.9	135,513	1,648,538	30.9	2.7
% Difference between Ames and Peer Average	8.1%	49.3%	-33.9%	-50.3%	33.3%	36.5%
Ames Rank	4	1	4	6	2	2

Source: National Transit Database

TABLE 7.6 - RIDERSHIP CHARACTERISTICS, AMES AND NATIONAL PEERS, 2003

Table 7.7 examines the financial performance of CyRide and its peers. CyRide's relatively low farebox recovery ratio is likely attributable to the elimination of fares for college students in 2002. The system fairs quite well, however, in terms of its cost per passenger and cost per revenue hour. Ames has a lower cost per passenger than any other system. However, its cost per revenue hour is somewhat higher, ranking sixth highest of the eight peer systems.

System	Operating Expenses	Fare Revenues	Farebox Recovery Ratio	Cost per Passenger	Cost per Revenue Hour
Bloomington, IN	$3,961,907	$723,728	18.3%	$1.9	$45.6
Champaign-Urbana, IL	$15,863,974	$4,106,479	25.9%	$1.7	$65.3
Lafayette, IN	$5,629,487	$1,385,142	24.6%	$1.4	$47.8
Pocatello, ID	$1,124,625	$248,442	22.1%	$2.3	$28.7
Santa Cruz, CA	$28,753,056	$5,460,884	19.0%	$4.6	$101.2
St. Cloud, MN	$5,120,054	$778,085	15.2%	$3.1	$50.8
State College, PA	$6,379,723	$3,085,449	48.4%	$1.1	$57.5
Ames	$4,716,152	$180,595	3.8%	$1.0	$46.6
Peer Average	$8,943,622	$1,996,101	22.2%	$2.1	$55.4
% Difference	-89.6%	-1005.3%	-478.5%	-112.6%	-18.9%
Ames Rank	6	8	8	8	6

Source: National Transit Database

TABLE 7.7 - FINANCIAL PERFORMANCE INDICATORS, AMES AND NATIONAL PEERS, 2003

On the whole, CyRide's ridership levels and efficiency generally outperform those of peer systems. However, this is primarily attributable to Ames' high ratio of college students to total population and therefore large proportion of transit-dependent residents. Thus, CyRide should strive to outperform its peers' levels of productivity.

Factors Influencing Ridership. When determining future transit needs, it is important to consider several factors affecting ridership levels, including:

- Land Use
- Transit Service Features
- Automobile Availability

Land use characteristics influencing transit demand include:

1. The size of downtown and major activity centers. The size of a downtown, in terms of commercial space, is typically the most important variable affecting feasible transit service, since downtowns are typically the single largest activity center in a city. Smaller downtowns, such as Ames' central business district, often have difficulty supporting more than limited local bus service. However, Ames' unique set of circumstances allow the city to support an extensive transit system focused outside of its downtown area.

These unique circumstances include:

- Iowa State University and its high travel demand.
- ISU's policy of restricting student parking on campus.
- Land use patterns that separate the campus from many high-density residential areas.
- Psychological acceptance of the system in the community.
- Sound system management.

As a result, transit demand is centered around the ISU campus and its linkages to areas of student housing throughout the city. Demand for transit service exists elsewhere in Ames, such as downtown, the North Grand Mall, and the South Duff Avenue commercial area, but on a much smaller scale. For this reason, CyRide's 3-hub system, with the ISU campus as the main hub and smaller hubs downtown and at the North Grand Mall, is generally effective.

Welch Avenue has traditionally been a gathering place with businesses catering to ISU student activities. It experiences heavy pedestrian and transit use as it provides a direct connection to the ISU campus.

2. Distance of housing from downtown and major activity centers. Distance translates into travel time, and people are less likely to use transit for long trips unless other modes of transportation are impractical.

3. Residential density affects the number of potential riders and, in turn, the level of service that can be supported. In most cases, the farther a residential area is from a city's major activity center, the greater the residential density needs to be to feasibly support transit service. This relationship is in conflict with normal development

patterns, where residential density typically decreases as the distance from the major activity center increases.

Transit service features affecting transit ridership include:

- Fare price
- In-vehicle travel time
- Access time

Increases in these features usually cause reductions in transit ridership, especially for riders who have an automobile available as an alternative. Conversely, improvements in these features usually result in increased ridership.

Studies have shown that changes in travel time affect ridership more than fare changes. In some instances, ridership elasticity related to in-vehicle travel time is twice as high as that related to fares. Access time, or the amount of walking time to the bus stop and waiting for the bus, usually has a higher elasticity than in-vehicle travel time. Walking time alone has the highest elasticity. That is, people become much less likely to use transit as their walking time to a transit stop increases.

While improvements to all of these features can increase ridership, the increase in cost is usually proportional to the improvement and the increase in ridership may not be sufficient to close the gap between cost and revenue.

Portions of Ames that are presently underserved by transit service include:

- The Northridge area west of G.W. Carver Avenue.
- Areas east of the Skunk River, including the Dayton Avenue industrial area.

7.2 System Policies and Enhancements

7.2.1 Long-Term Policies

As Ames changes and grows, CyRide's services must be adjusted to provide continued mobility of all residents. Because transit's importance as a mode of transportation will likely increase in the future, continued system expansion and improvement of service is critical. The following long-term policies stem from the broader goals, objectives and policies outlined earlier in this Plan.

- Add service to areas experiencing deficiencies, particularly those with transit-dependent populations, including concentrations of students, senior citizens, renters and low-income households.
- Ensure transit service within ¼ mile of low-density residential areas and 1/8 mile of medium and high-density residential areas.
- Ensure that the design of new retail and employment centers provides access for buses and includes adequate pedestrian access to transit stops.
- Ensure minimal headways along heavily traveled routes, in-vehicle travel times of less than 30 minutes between major activity centers and that trips require no more than one transfer.
- Maintain a cost per revenue mile, cost per revenue hour, farebox recovery ratio, and ridership level that is well above the average performance level of peer transit systems.
- Establish a goal that the majority of the routes do not fall below 60% of the system-wide average for each performance measure.

7.2.2 Short-Term Policies: Recommended New Routes and Route Extensions

New CyRide routes are intended to serve areas currently lacking convenient access to transit and projected new development areas. Route extensions are intended to provide access to underserved areas located just beyond the terminus points of existing service routes. Table 7.8 presents additional routes and route extensions recommended by the 2000 Transportation Master Plan.

The 2000 plan also recommended improving shuttle service to the Des Moines airport and developing a downtown transportation center as a hub for intermodal connections.

New Routes	Description	Implemented?
Route A	Serves East Industrial and Regional Commercial	No. Extensions of Red, Blue, and Orange routes should replace a new route.
Route B	Serves Uthe property, Somerset, Northridge, Oakwood/ Zumwalt Station area to ISU and N. Grand	No. Similar route proposed.
Extensions		
Red	1/2 mile east from terminus on Mortensen Rd.	No. Covered by a new route proposed.
Brown	1/4 mile east from ISU Research Park to west side of airport	No. Little demand exists in this area.
Purple	west on Lincoln Way to County Line Rd., then south to extended Mortensen Rd.	Partially. Route has been extended into newly developing areas.
Green	west from terminus on Ontario St. to County Line Rd.	Partially. Route has been extended west into newly developing areas. Service to County Line Road is not needed.
Orange	east from Veterinary School to Old Orchard mobile home park and S. 16th St. business parks	Yes.
Blue	through redeveloped Hawthorn Village student housing	Cardinal route extended instead.

TABLE 7.8 - 2000 TRANSPORTATION MASTER PLAN RECOMMENDATIONS

Neither of these recommendations have been implemented. Because of stagnant ridership levels on the existing airport shuttle, expansion of that service in the near future is not feasible.

This plan recommends the following changes, shown on Figure 7.5:

1. Extend the Blue route east along Lincoln Way and to the future East 13th Street commercial area. The portion of Ames east of Duff Avenue is presently not served by CyRide. Existing employment centers and projected employment growth on the city's east side, as well as a potential regional commercial area, will generate demand for service in this area. The Blue route should be extended east on Lincoln Way, north on Dayton Avenue and east on East 13th Street to a potential regional commercial area at Interstate 35 (this extension should only occur if and when this commercial area is developed). It should then return to the ISU campus following the same route.

2. Reroute the Red route east along East 13th Street from Duff Avenue to Interstate 35. When regional commercial development occurs at East 13th Street and Interstate 35, extending both the Blue and Red routes into the area will become

necessary to handle an estimated 1,100 new trips. Rather than continuing north on Duff Avenue to the North Grand Mall, the Red route should turn east on East 13th Street to the potential commercial area. It should then return to the ISU campus following the same route.

3. Reroute the Purple route along the current Red route to North Grand Mall. To compensate for rerouting the Red route, the Purple route should be extended north and east from its present terminus at the ISU campus. It would follow Stange Road north from the campus, turn east on 13th Street, and north on Duff Avenue to North Grand Mall. It would return to the campus following the same route.

4. Extend the Orange route east along South 16th Street. The Orange route would be extended east on South 16th Street from Duff Avenue to Dayton Avenue. This extension would serve both the Dayton/16th Street employment area and a planned community college campus.

5. Eliminate the Purple route and reroute the Red route west of the ISU campus. The current Purple route largely duplicates the service area of the Red route, which has resulted in comparatively few passengers and a gradual decline in ridership. The Purple route should be eliminated west of the ISU campus and the Red route should be rerouted to serve areas along Lincoln Way west of Dakota Avenue presently served by the Purple route, including Thackery Avenue and Todd Drive.

Transit ridership represents over 7% of the total trips taken in the metropolitan area.

This route could be extended farther west as new residential development occurs. The proposed new Red route should continue south on Dakota Avenue and then west on Mortensen Road to the present terminus of the Purple route. Areas along Mortensen Road east of Dakota Avenue, including the new Ames Middle School, would be served by a new Northwest/Southwest route. During the preparation of this report, CyRide has begun to implement this recommendation.

6. Add a new Pink route, or existing route extensions, to serve neighborhoods on the city's northwest and southwest sides. A new route could be added extending both northwest and southwest from the ISU campus once sufficient residential density exists on the city's northwest and southwest sides. This alternative is illustrated on Figure 7.5. The northern portion could follow Stange Road (duplicating the Brown route) and G.W. Carver Boulevard into the Northridge neighborhood and developing areas north of Bloomington Road. The southern portion should follow Lincoln Way west, State Avenue south, and Mortensen Road west to the new Ames Middle School. It should then continue west to serve apartment complexes near the intersection of Mortensen and Dakota. The Northwest/Southwest Route should then follow Dakota Avenue south to future neighborhoods south of Highway 30.

It should be noted that considerable discussion occurred about eliminating the Yellow route due to low ridership. The Blue and Orange routes presently serve areas along

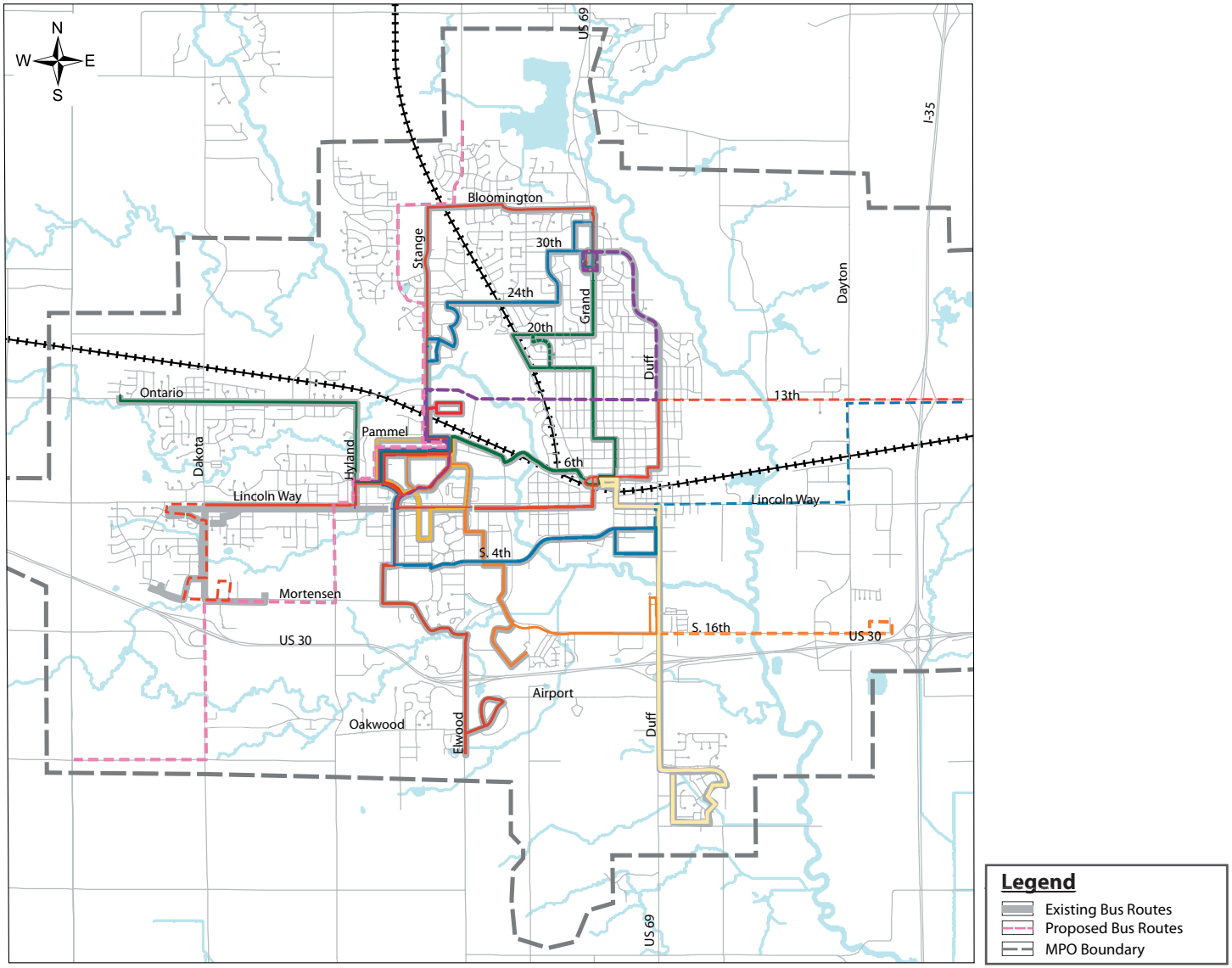


FIGURE 7.5 - PROPOSED BUS ROUTES

South Duff Avenue north of Highway 30 in addition to the Yellow route. Thus, eliminating the route will have little impact on transit coverage in this area. While the Southdale neighborhood would no longer receive fixed-route service, this area presently generates very few passengers. However, additional apartments near South Duff Avenue and Crystal Street could increase demand in the Southdale area in the future. Eventually extending the Orange route south along Duff Avenue from South 16th Street to Crystal Street may address this need. It was determined at the MPO Policy Board Meeting on October 11, 2005 that removing the Yellow route would not be included as a recommendation in the LRTP but would be taken under advisement.

7.2.3 Recommended Changes to Service Hours and Frequency

The 2000 plan recommended the following changes:

- Increasing service frequency on the three main routes (Red, Blue and Green) during peak hours.
- Extending or adding off-peak and weekend hours to the other routes.

Changes implemented since 2000 include:

- Headways were reduced to 10 minutes on the Red route and portions of the Blue route.
- Headways were reduced on the Brown route after it was combined with the Gray route.
- Campus circulator routes (Cardinal, Gold, Orange and Silver) were started with minimal headways.
- Additional buses were added to the Blue route Saturday and Sunday evenings and the Red route on Sunday evenings.
- Blue express routes were added from South 5th to the ISU campus.

The 2005 plan recommends an additional change:

- Adding Saturday service to the Brown route. This service would only apply to the north one-half of the Brown route, as the southern half is an employment route serving the ISU Research Park. Saturday service is currently provided to the other quadrants of the city and extending this service to the Brown route will serve to equalize weekend service to the entire community.

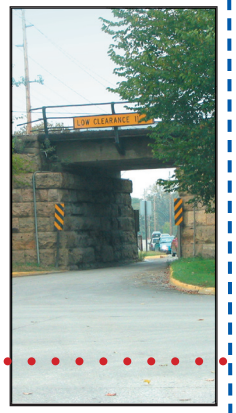
7.2.4 Light Rail Service

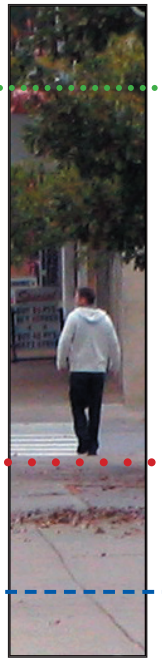
There is currently strong local interest in bringing back to Ames a light rail transit service known as the "Dinky". This steel rail/steel wheel traditional trolley service would link the Ames downtown with the ISU campus. One option would be for the Dinky service to replace the current Orange route. The feasibility of reestablishing this trolley service should be investigated.

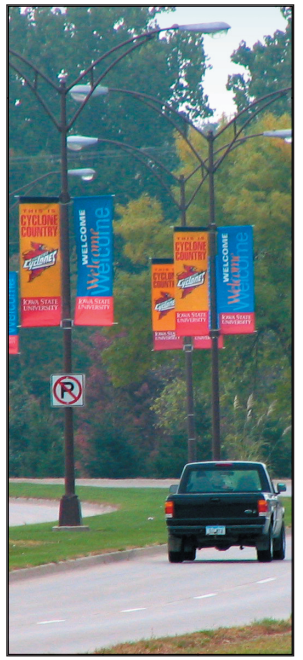
Hayes Avenue is a quiet residential street except immediately before and after hours while Ames High School is in session. Many residents requested restriction in student automobile use and increase transit to reduce congestion.

Other Modal Systems

Section 8







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Solutions Through Service

Air, rail and truck are additional transportation system elements within the Ames area. These systems complement the highway and transit systems and provide various opportunities for multi-modal transfer of goods, services and people.

8.1 Existing Systems

The existing air, rail and truck systems within the study area are described below.

8.1.1 Air

Air transportation in the Ames area is provided by the Ames Municipal Airport, which is a general aviation airport (no scheduled commercial air service). The movement of freight into and out of Ames via the airport is minimal at this time. Notes regarding the airport are as follows:

- Access to the terminal area is provided via Airport Road that is a 4-lane roadway functionally classified as a minor arterial. Year 2030 traffic projections indicate this roadway will operate at acceptable level of service for the term of this plan.
- Eighty-six aircraft are based on the field.
- There are an average of 119 aircraft operations per day.
- There are two 100-foot wide runways. Runway 01/19 is 5,700 feet in length and has a concrete surface. Runway 13/31 is approximately 3,500 feet in length and has an asphalt surface.

The City of Ames has received a grant from the Federal Aviation Administration to prepare a master plan for the airport in fiscal year 2006. The master plan will consider whether facilities should be upgraded to accommodate increased freight traffic in the future.

8.1.2 Rail

The Ames area is served by the Union Pacific Railroad. Two tracks run in an east-west direction and a single track runs in a north-south direction through the study area. The east-west track is UPRR mainline carrying over 70 trains per day. The railroad has daily switching service. There is no piggyback ramp (incline for loading and unloading trailers from a flat car) available locally. In addition, there are no intermodal facilities within the MPO boundaries and none are planned in the future.

The City of Ames studied the feasibility of relocating the Union Pacific Railroad mainline either north or south of the city as part of the "Duff Avenue/UPRR Crossing Study" (April 2002). Moving the tracks would reduce car/train conflicts and reduce delays but the cost and potential environmental impacts were considered too great to pursue the project at this time.

Truck traffic in Ames generally uses the state highway and arterial street system. Local streets within industrial areas should be designed to accommodate large vehicles.

8.1.3 Truck

The Ames area has many industrial and manufacturing facilities that rely on trucking for the movement of goods. Approximately 50 motor freight carriers serve the community.

Truck traffic is generally concentrated in the industrial and regional commercial areas of the planning area. The Land Use Policy Plan, illustrated in Figure 4.1, shows where these areas are. Generally, they are located along I-35 from the U.S. 30 to the 13th Street Interchange. These areas are well served with an existing arterial street system.

The following projects discussed in Section 5 of this plan will further enhance freight movements:

- 1. U.S. 30 and 580th Avenue Grade Separation
- 20. Freel Drive Reconstruction and Extension from Lincoln Way to Dayton Avenue
- 22. Bloomington Road Extension from Grand Avenue to I-35
- 37. U.S. 69 Widening from Bloomington Road to Riverside Road
- 42. 570th Street Reconstruction

As new roadways are constructed in industrial and commercial areas, they should be designed to meet standards outlined in the "Iowa Statewide Urban Design and Specifications" (SUDAS). These standards outline desirable design criteria for streets that accommodate heavy truck traffic.

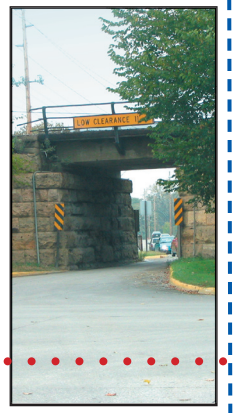
8.2 Future Systems

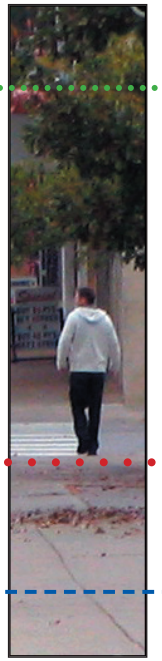
In the future, activities should continue to be aimed at coordination between the various modes of transportation to provide an efficient and effective transportation system. Ongoing planning and improvements that address freight will help to maintain the region's economy. Additionally, communications and involvement with freight providers can provide helpful insight into needed transportation system improvements (signal timing, geometrics, signage) that should be included in future plans.

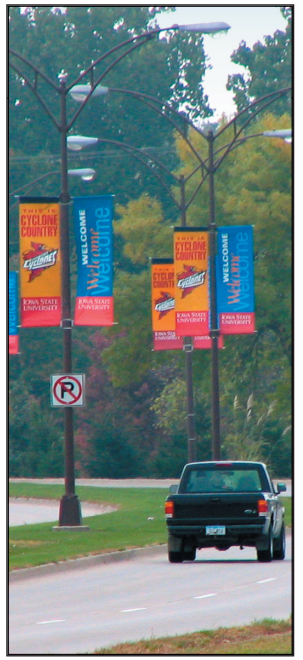
The UPRR crossing on North Dakota Ave was included as a project in the latter years of this plan. It will reduce delays and improve safety on this important arterial street.

Proposed Plan

Section 9







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Solutions Through Service

As discussed in the previous sections, the proposed long range transportation plan includes the following:

- Roadway improvement plan
- Bicycle facilities plan
- Pedestrian facilities plan
- Transit system policies and enhancements

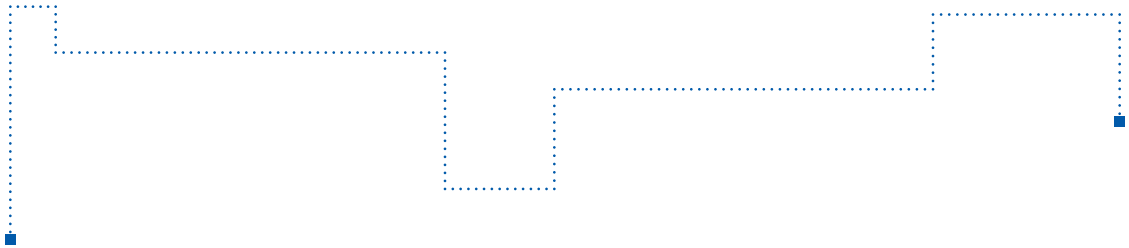
9.1 Plan Approval Process

The following process occurred in order to obtain approval for the proposed plan:

- **August 4, 2005** – The proposed plan was presented and accepted during the third and final public meeting.
- **August 23, 2005** – The proposed plan was presented and approved by the Technical Committee.
- **October 11, 2005** – The AAMPO Policy Board gave final approval for the proposed plan.

9.2 Goals and Objectives Comparison

Section 2 of this report identified the goals and objectives that were identified for the Ames Area MPO LRTP. While each project and each group of projects were evaluated throughout the entire process in terms of criteria that could be measured, it is important to revisit the goals and objectives to see if they have been achieved by the recommended plan. Table 9.1 summarized the results of that review.

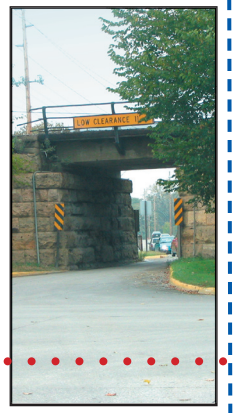


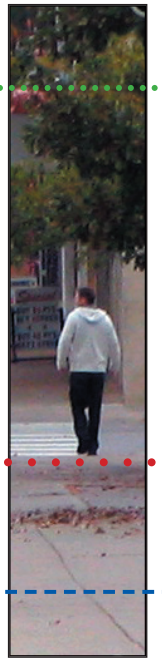
Goal	Goal Achieved?	Discussion
Coordinate the various modes of transportation.	Yes	The plan incorporates pedestrian, bicycle and transit improvements with roadway projects.
Provide efficient transportation service.	Yes	The plan is efficient with improved travel times, less delay and reduced congestion. All intersections and roadway segments are expected to operate at an acceptable level of service.
Provide safe travel.	Yes	The plan should improve safety by reducing congestion and providing for more direct travel to work, shopping and recreation areas.
Provide interconnection of non-motorized transportation facilities.	Yes	The plan provides greater access to the roadway system and transit facilities for bicyclists and pedestrians. Several miles of new mixed use trail facilities are proposed.
Enhance economic development.	Yes	The plan improves several roadways providing convenient access to under utilized property within and outside the city limits.
Minimize negative impacts.	Yes	The efficiency of the proposed roadway system will have a positive effect on the environment. Proposed new roadway alignments, transit routes and pedestrian facilities minimize the need to acquire right-of-way and widen existing streets.
Integrate with the Land Use Policy Plan.	Yes	The Land Use Policy Plan was used as the basis for all socio-economic data used in the planning process.
Establish interagency coordination and cooperation.	Yes	The plan was put together under the supervision of the agencies that are members of the Ames Area MPO.
Provide a financially feasible transportation plan.	Yes	The plan is fiscally constrained which means that the projects listed can be constructed in the next 25 years with current funding levels.
Commitment to implement the improvements according to a schedule.	Yes	The plan provides a schedule of short, mid and long term projects. Approval of the plan by the MPO Policy Board reflects the commitment of member agencies to maintain this schedule.

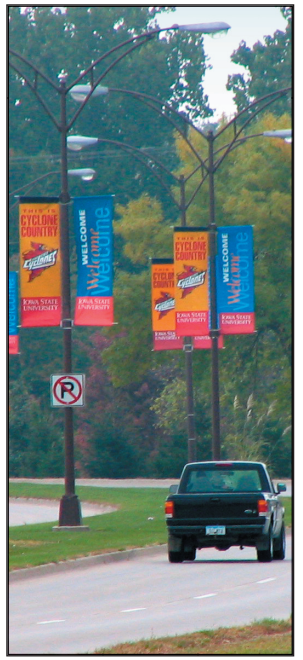
TABLE 9.1 - RECOMMENDED PLAN GOALS AND OBJECTIVES COMPARISON

Project Funding

Section 10







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Solutions Through Service

PROJECT FUNDING

The LRTP is fiscally constrained, meaning it identifies sufficient revenue to fund its implementation over the 25-year planning horizon.

10.1 Revenue and Expenditure Forecast

Table 10.1 contains the revenue and expenditure forecast for the Ames Area MPO LRTP.

10.2 Roadways, Bicycles, and Pedestrians

Table 10.2 lists the breakdown and cost of the short, mid and long term LRTP roadway, bicycle and pedestrian projects. Figure 10.1 illustrates the short, mid and long term roadway improvement plan.

Current Annual Revenue (in millions of dollars)	
City of Ames General Fund – Roadway Maintenance	$1.9
City of Ames General Fund – Shared Use Path Maintenance	$0.1
General Obligation Bonds	$5.5
Road User (Gasoline) Tax	$1.1
Surface Transportation Program	$1.0
Enhancements	$0.1
CyRide City of Ames Tax $1.6 ISU $0.7 GSB $3.0	$5.3
Other Sources	$0.9
TOTAL	$15.9
Current Annual Expenditure (in millions of dollars)	
City of Ames – Roadway Maintenance	$1.9
City of Ames – Shared Use Path Maintenance	$0.1
City of Ames – Repair, Reconstruction and Operation[1] Annual Traffic Signal Program $0.8[2] Traffic Engineering Studies $0.5[2] Collector Street Rehabilitation Program $7.6[2] Asphalt Resurfacing $2.5[2] Arterial Street Rehabilitation $4.0[2] Neighborhood Curb Replacement Program $0.3[2]	$3.1
CyRide Funding	$5.3
Funds Available for Road and Trail Construction	$5.5
TOTAL	$15.9
Year 2006 – 2030 Funds Available for Roadway, Bicycle and Pedestrian LRTP Projects	
25 x $5.5 Million/year	$137.5 million
Year 2006 – 2030 Funds Available for Roadway and Shared Use Path Maintenance; Roadway Repair, Reconstruction and Operation; CyRide; and Road and Trail Construction	
25 x $15.9 Million/year	$397.5 million

TABLE 10.1 - REVENUE AND EXPENDITURE FORECAST

Notes:
1. The cost is based upon a 5-year average of projected operations and maintenance expenditures through 2010.
2. Projected 5-year total costs.

Alternative Number	Alternative Name	Short Term (0-5 years)	Mid-Term (6-15 years)	Long-Term (16-25 years)	Total (0-25 years)
	Phase I - Shared Use Path System	1,031,000			
	Grand Avenue Extension - Lincoln Way to South 4th Street	3,379,000			
	South Dayton Avenue Realignment	150,000			
	South 16th Street Widening (Elwood Drive to K-Mart Drive)	900,000			
33	20th Street and Grand Avenue Intersection Improvements	1,600,000			
	Elwood Drive Extension - 6th Street to 13th Street Feasibility Study	150,000			
	South Duff Avenue Improvement Project	275,000			
28	SE 16th Street Reconstruction	6,600,000			
16	13th Street and Grand Avenue Intersection Improvements	4,000,000			
3	Grand Avenue Extension - South 5th Street to South 16th Street	4,500,000			
36	South Dakota Avenue Widening	2,000,000			
	Dotson Drive and Lincoln Way Intersection Improvements	725,000			
19	Dotson Drive Extension	1,500,000			
	Phase II - Shared Use Path System		3,401,600		
20	Freel Drive Reconstruction and Extension		3,100,000		
13	Mortensen Road Extension		3,000,000		
6	Lincoln Way and Duff Avenue Intersection Improvements		2,800,000		
7	Lincoln Way/Clark Avenue/South Walnut Avenue Interseciton Imp.		2,100,000		
9	South Duff Avenue Widening		3,300,000		
10	County Line Road Reconstruction		1,600,000		
35	South 5th Street and Lincoln Way Connection		5,300,000		
14	South 5th Street Extension		2,600,000		
42	570th Avenue Reconstruction		3,800,000		
22	Bloomington Road Extension - Grand Avenue to 570th Avenue		24,500,000		
	Bloomington Road Extension - Grand Avenue to 570th Avenue Environmental Impact Study		500,000		
	Phase III - Shared Use Path System			4,772,000	
26	North Dakota Ave./UPRR Grade Separation			4,400,000	
1	U.S. 30/580th Ave. Grade Separation			8,300,000	
37	US 69 Widening			3,200,000	
4b	Elwood Drive Extension - 6th Street to 13th Street			9,900,000	
21	Bloomington Road - G.W. Carver Ave. to County Line Road			18,700,000	
	Estimated Total Cost	26,810,000	56,001,600	49,272,000	**132,083,600**
	Estimated Revenues	27,500,000	55,000,000	55,000,000	**137,500,000**

TABLE 10.2 - SHORT, MID AND LONG TERM PROJECTS

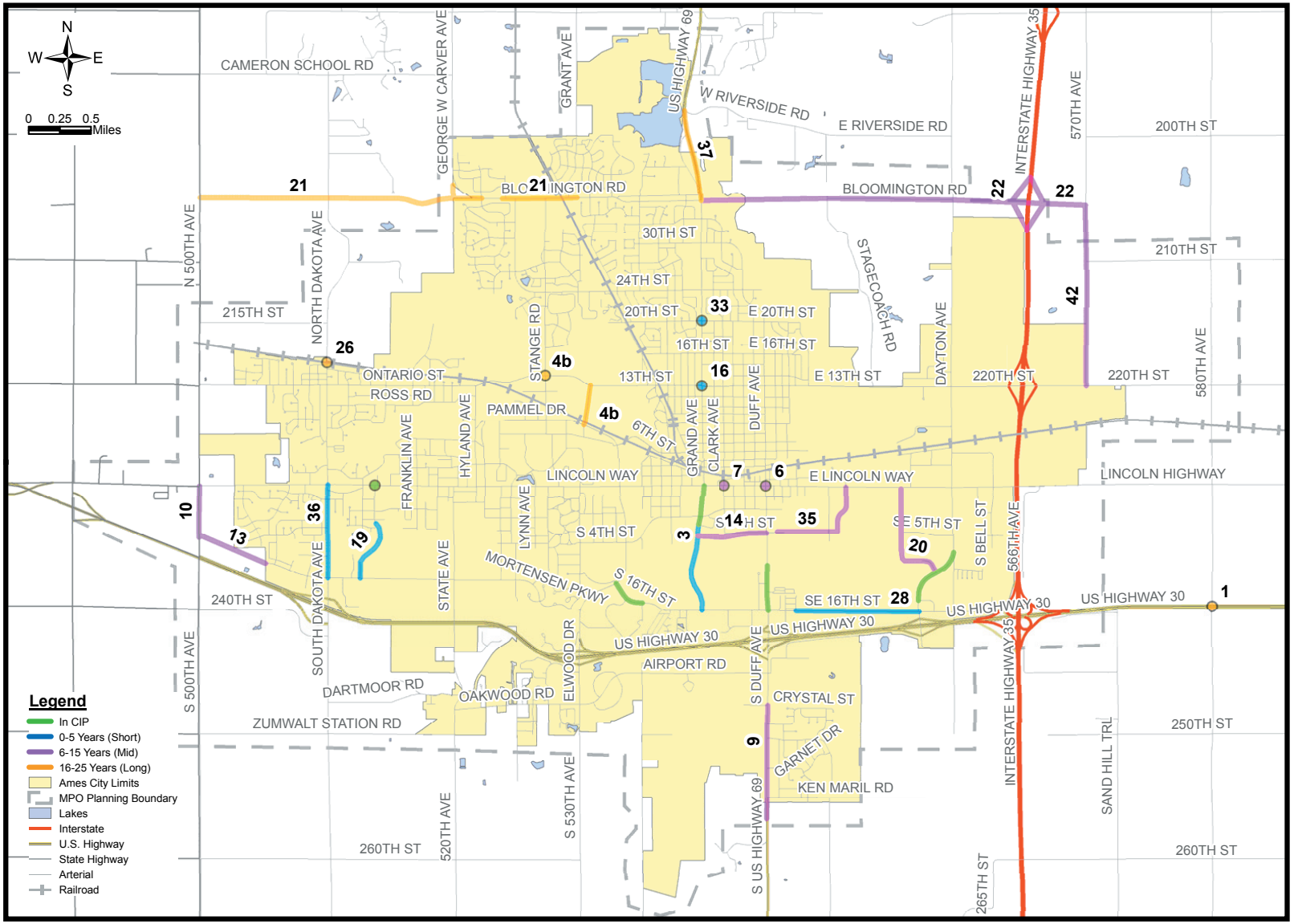


FIGURE 10.1 - SHORT, MID AND LONG TERM ROADWAY IMPROVEMENT PLAN

10.3 Transit

Table 10.3 provides a financial analysis of recommended CyRide route revisions. The analysis is intended to be illustrative only and does not represent a decision by the MPO or CyRide to fund route expansion or eliminate any routes. Funding for routes will need to be determined between the City of Ames, ISU and GSB. The purpose of the table is to provide cost estimates for the revisions.

Notes regarding Table 10.3 are as follows:

- Table 10.3 provides a financial analysis of the transit Short-Term Policy Recommendations 1, 2 and 3 based on a CyRide staff report recommending alternative schemes to serve the new mall area. The recommendations reflect the recommended alternative from the staff report and utilize the cost estimates included in that report.
- Table 10.3 also provides a financial analysis of the additional transit Short-Term Policy Recommendations.
- The assumptions incorporated in the analysis are based upon available information and discussions with CyRide staff.
- It is important to recognize that while the "Annual Cost" column includes amortization costs for buses based on a twelve-year depreciation schedule, the analysis does not include the substantial up-front bus acquisition costs of approximately $300,000.00 per bus.
- The "Funding Source Split" column was included to illustrate estimated cost increases or savings resulting from each recommended change, split among the CyRide local funding sources. As shown in Table 10.1, the current funding breakdown for CyRide is as follows:

  - City of Ames = $1.6 million
  - ISU = $0.7 million
  - GSB = $3.0 million

  $5.3 million

  There is a separate mill levy that is currently $0.56/$1,000 and can be raised to $1.05/$1,000.
- Incremental extensions to existing routes can occur as additional development occurs in Ames' growth areas. In fact, this is the most likely scenario. For that reason, the Table 10.3 Financial Analysis includes an estimate of the costs, revenues and funding gap associated with an incremental extension of bus service into a newly developed, primarily residential area.

Recommended Change	Annual Cost	New Buses	Farebox Revenue[1]	Cost/ Revenue Gap	Funding Source Split[2]
1. Extend Blue route to serve future mall	$250,048[3]	2[3]	$10,000	$240,000	City: $72,960
					ISU: $31,680
					GSB: $135,360
2. Extend Red route to serve future mall	$156,089[3]	1[3]	$6,244	$149,845	City: $45,553
					ISU: $19,780
					GSB: $84,513
3. Reroute Purple route to serve North Grand Mall	$132,949	0[3]	$5,318	$127,631	City: $38,800
					ISU: $16,847
					GSB: $71,984
4. Extend Orange route east on S. 16th	$44,964[4]	0	$11,505[5]	$33,549	City: $10,199
					ISU: $4,428
					GSB: $18,922
5. Eliminate Purple Route, expand Red Route[6]					
6. Addition of Pink Routes	Incremental Cost per Mile of route extension = $45,084[7]	0[8]	Incremental Revenue per Rev. Mile = $1,803[1]	$43,281 per Rev. Mile	Per Mile Costs:
					City: $13,157
					ISU: $5,713
					GSB: $24,410
7. Add Saturday service to Brown Route (North half only)	$21,090[9]	0	$844.00[1]	$20,246	City: $6,155
					ISU: $2,672
					GSB: $11,419

TABLE 10.3 - FINANCIAL ANALYSIS OF RECOMMENDED ROUTE REVISIONS

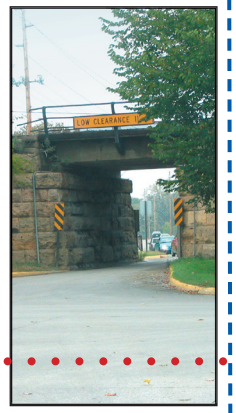
Notes:
1. Based on system-wide Farebox Recovery Ratio of .04
2. Average percentage of yearly revenues, 1981-82 to 2005-06: City - 30.4%, ISU - 13.2%, and GSB - 56.4%
3. CyRide Staff Report, received Sept. 23, 2005
4. Assumptions: 3.74 additional miles/round trip
8 trips/day, 260 days/year
$5.78 Expense/mile (includes depreciation) per CyRide staff report
5. Assumptions: Based on Year 2030 trips estimated to TAZ's 113, 114: 1392 total trips per Transportation Model
Average Fare=$0.75
Percent of all trips that are transit, per 2000 Census: 5.7%
75% of all rides fare-paying
6. Staff indicates that this conversion is already underway, with about one-half of the conversion accomplished. Conversion to date has saved agency approximately $60,000.00. Remaining conversion will be accomplished with the addition of five trips to the Red Route, allowing the Purple Route (west of Campus trips) to be eliminated.
7. $5.78 per revenue mile, 30 trips/day, 260 days/year
8. Capital depreciation costs (12-year bus amortization) included in $5.78 figure. Does not include up front bus acquisition costs of $300,000 per bus.
9. Per CyRide staff: $37.00/hr., 10 hrs./day, 57 days/year

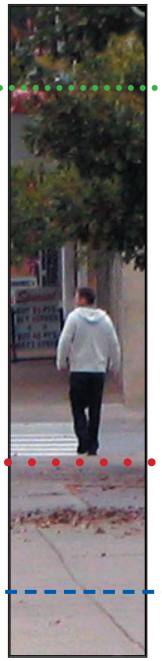
It should be noted that these estimates are subject to the following limitations:

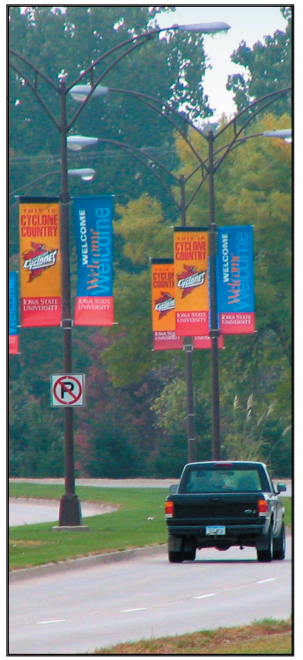
- Significant changes in travel behavior are possible over the next 25 years.
- Because of the long range nature of the plan and lack of detailed cost estimates based on actual design, the total costs shown may vary.

Appendix

Section 11







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Solutions Through Service

Appendix

The Appendix includes:

- **Plan View of Potential Candidate Alternative**
- **Base Projects and Improvement Groups –**
  Key Intersection LOS and Change in Traffic Volumes from the 2030 E+C Network