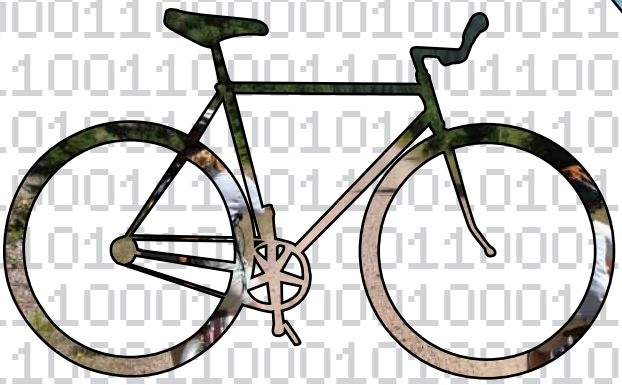
Dubuque Metropolitan Area Transportation Study

Planning for the Future of Transportation



Long Range Transportation Plan 2040

Chapters

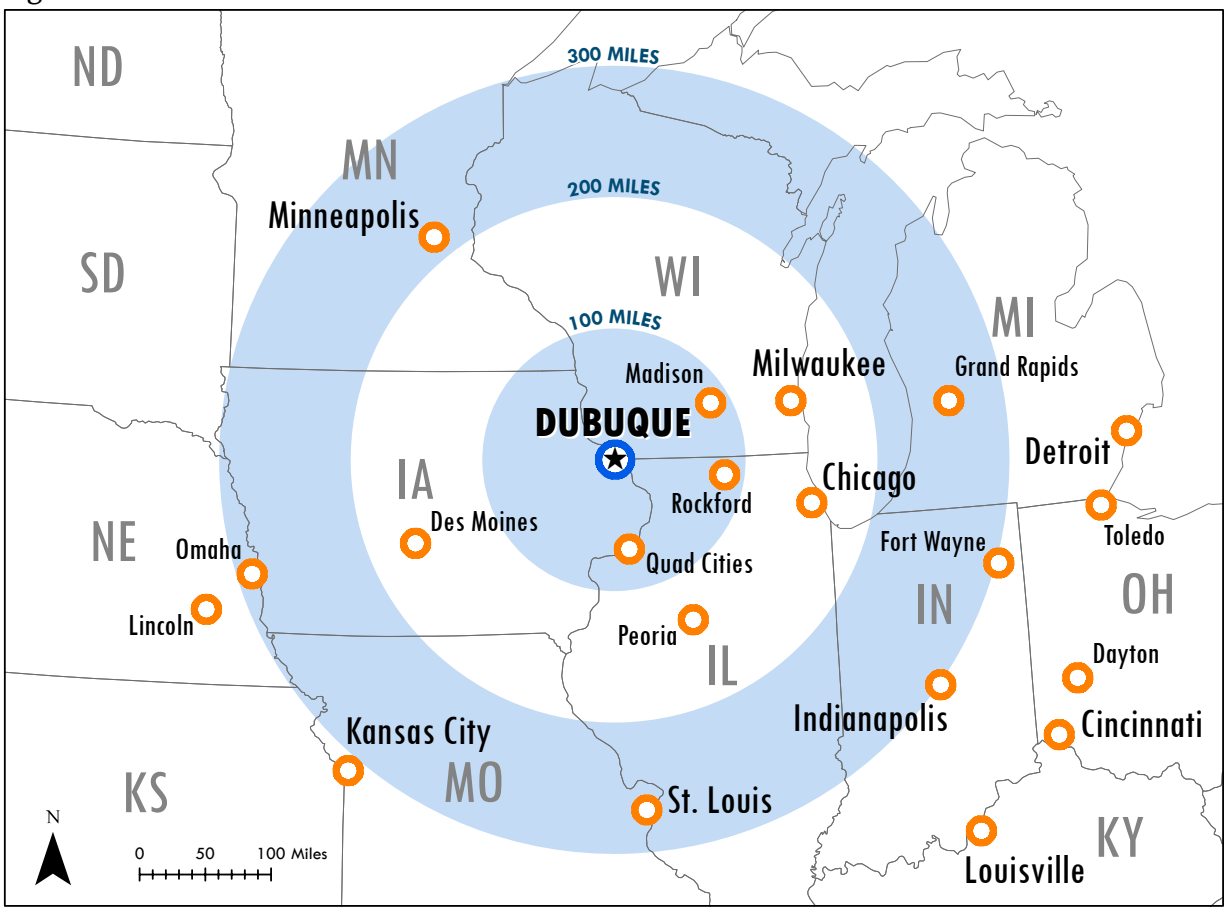
2040 Long Range Transportation Plan

A long-range transportation plan is a statement of how the DMATS area intends to manage its transportation system for the next 30 years. Federal law requires the creation of a plan that provides an assessment of current transportation trends in the area as well as to aid in forecasting potential changes for the future. The current plan is an update of the 2031 Long-Range Transportation Plan that was adopted in 2006. The 2036 plan is guided by an updated set of goals, principles, and objectives. The major focus of the update to 2036 was to: Ensure that Federal requirements are met; and Reflect current transportation issues and concerns of the Dubuque Metropolitan Area Transportation Study (DMATS).

The Dubuque Metropolitan Area

The Dubuque Metropolitan Area is a small metropolitan area located at the convergence of the state boundaries of Iowa, Illinois and Wisconsin. The 2000 Census population for the City of Dubuque, Iowa (the largest city represented in DMATS) was 77,018. Approximately 90% of the DMATS population lives in the Iowa portion of the area. Dubuque was the first area settled in Iowa. Early settlers were drawn to the area by lead mining, trading, and river transportation. Figure 1.1 shows the location of Dubuque in relation to surrounding metropolitan areas.

Figure 1.1

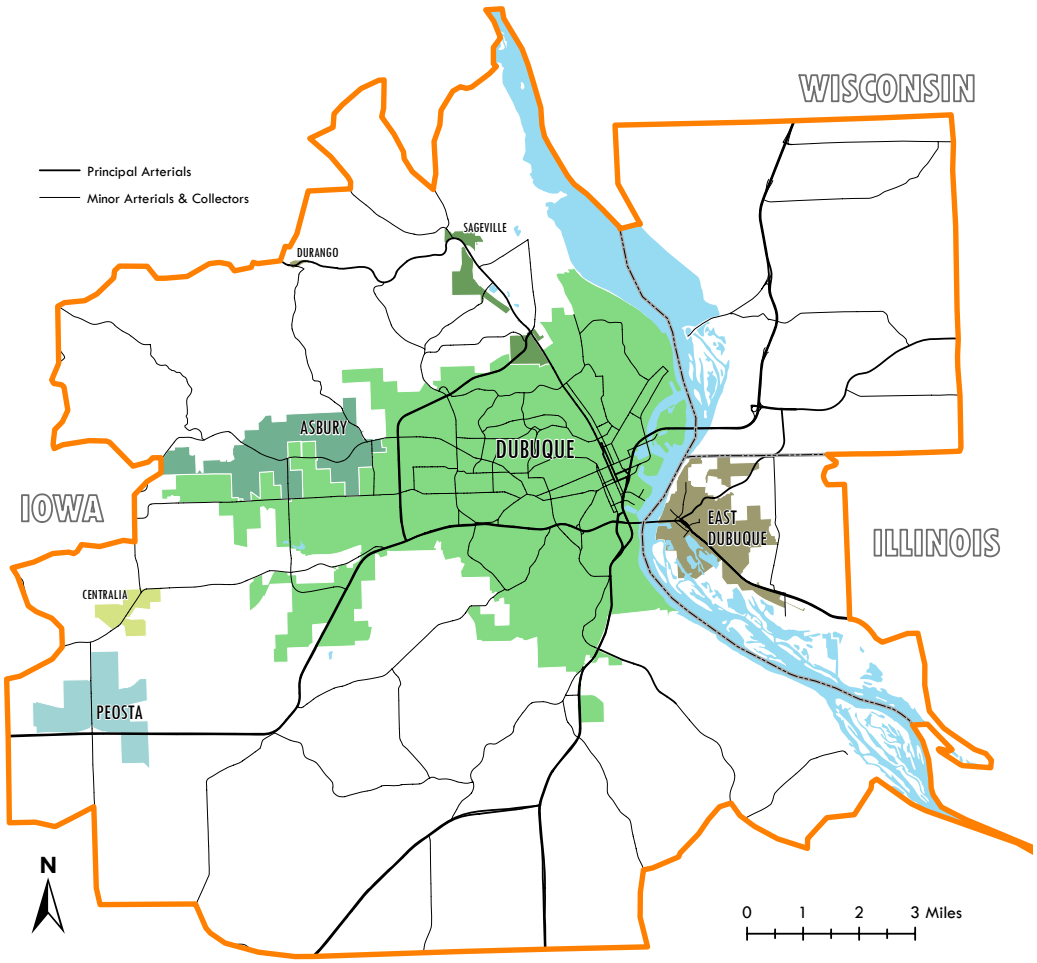


The Dubuque Metropolitan Area Transportation Study

The Dubuque Metropolitan Area Transportation Study (DMATS) is the metropolitan planning organization for the Dubuque Metropolitan Area. Two committees make up the organization; Technical and Policy. As the Metropolitan Planning Organization (MPO) for the three-state Dubuque Metropolitan Area, DMATS is responsible for maintaining a continuous, comprehensive, and coordinated ("3-C") transportation planning process. DMATS is also responsible for carrying out the Federal Government's Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in the area.

DMATS is composed of a broad mixture of local, regional, state and federal officials from all three states. The local governments represented on the DMATS Committees are the cities of Asbury, Dubuque and Sageville (non-voting), and Dubuque County in Iowa; East Dubuque and Jo Daviess County in Illinois; Jamestown Township, and the unincorporated town of Kieler and Grant County in Wisconsin. In addition, DMATS has representation from the Iowa, Illinois, and Wisconsin Departments of Transportation; the East Central Intergovernmental Association (ECIA), a member of the regional councils of government in Iowa; Southwest Wisconsin Regional Planning Commission; Keyline Transit; Region 8 Regional Transit Authority; and the Federal Highway Administration. Figure 1.2 shows the local governments that are represented on the DMATS board.

Figure 1.2



The DMATS Vision

The Dubuque Metropolitan Area remains a vibrant Upper Midwest Mississippi River region, with a transportation system that provides efficient movement of people and goods. This system promotes the area's economy and environmental quality, and operates in an attractive and safe setting that serves everyone. The system is fiscally sustainable, driven by a collaboration of involvement by citizens and key stakeholders, promotes areas of concentrated growth, manages both demand and capacity, employs the best technology, and unites air, bicycle, pedestrian, rail, roadway, mass transit, and waterway facilities into one fully interconnected network.

DMATS has created specific goals along with priorities and objectives for each goal according to the area's transportation needs. These goals, priorities and objectives are as follows:

Goals and Objectives

Goal 1: Improve the economic vitality of the region.

- *Obective 1:* Improve access to major job centers for all modes of transportation.
- *Obective 2:* Develop roadways that support development consistent with locally adopted plans.
- *Obective 3:* Support the development of regionally significant projects by the states of Iowa, Illinois and Wisconsin.
- *Obective 4:* Increase the reliability of the transportation system for the movement of freight.
- *Obective 5:* Encourage increased commitments from employers to offer measures that will improve the convenience of the commute for their employees.
- *Obective 6:* Develop increased public transit options for air passengers using the Dubuque Regional Airport.
- *Obective 7:* Plan for the increase in air passengers, air cargo, and waterborne cargo.
- *Obective 8:* Enhance the coordination of transit operations to improve efficiency and effectiveness.
- *Obective 9:* Establish regional passenger rail connections.
  - **Priority 1:** Southwest Arterial.
  - **Priority 2:** New US Highway 20 Mississippi River Bridge between the cities of Dubuque, IA and East Dubuque, IL – Julien Dubuque Bridge.
  - **Priority 3:** US Highway 20 Capacity Improvements from Peosta Interchange to Devon Drive.
  - **Priority 4:** University Avenue and Asbury Road from Delhi Street to Seippel Road.
  - **Priority 5:** Pennsylvania Avenue and Middle Road.
  - **Priority 6:** John F. Kennedy Road from Wacker Drive to Asbury Road.
  - **Priority 7:** Clarke Drive from West Locust Street to Asbury Road.
  - **Priority 8:** US 20 Frontage Road from Barge Terminal Road to Frentress Lake Road.
  - **Priority 9:** Intersection Improvements on US 20 at Barge Terminal Road and at Frentress Lake Road.

Priority 10: Arterial Extension from US 20 to North Cascade Road.

Priority 11: Ice Harbor Street projects associated with the America's River Project (including Bell Street, 3rd Street, 4th Street, 5th Street, and a proposed road around the west side of the Ice Harbor.)

Goal 1: Improve safety and security for system users.

Obective 1: Minimize accidents through roadway improvements in existing high accident areas.

Obective 2: Reduce conflicts and minimize accidents between vehicles and transportation modes by implementing access management strategies.

Obective 3: Maximize the safety and security of motorists using the area's transportation system.

Obective 4: Maximize the safety and security of mass transit system users and operators.

Obective 5: Assist local jurisdictions in their efforts to implement effective strategies to enhance safety for pedestrians and bicyclists.

Obective 6: Implement intelligent transportation systems.

Obective 7: Develop Safe Routes to School plans for schools in the DMATS area.

Priority 1: Southwest Arterial.

Goal 2: Improve mobility and connectivity for persons and freight.

Obective 1: Expand regional transit systems to improve transit access to all destinations including new job centers.

Obective 2: Improve truck access to the primary freight business locations.

Obective 3: Implement intelligent transportation systems to reduce travel delays and minimize traffic congestion.

Obective 4: Improve the pedestrian and bicycle trails network.

Obective 5: Implement access management strategies in major corridors.

Obective 6: Improve the integration of transportation modes.

Obective 7: Develop a regional freight movement system to minimize travel delays.

Obective 8: Improve waterborne passenger transportation.

Obective 9: Develop mass transit connections between the Mississippi Riverfront and the down-town area.

Obective 10: Expand fixed-route bus service to the outer limits of the DMATS boundary.

Obective 11: Promote a multi-modal transportation network though the DMATS area.

Obective 12: Establish regional passenger rail connections.

Priority 1: Complete the Southwest Arterial Corridor.

Priority 2: Complete the four-lane US HWY 20 Mississippi River Crossing-Julien Dubuque Bridge.

Priority 3: Complete long-term capacity improvements to US HWY 20 from Devon Drive to the Peosta interchange.

Goal 3: Enhance sensitivity to the environment.

Obective 1: Implement intelligent transportation systems to reduce travel delays and minimize air pollution.

Obective 2: Minimize the impacts of projects to low-income and minority populations, and environmentally sensitive areas including flood plains.

Obective 3: Ensure the DMATS plans and programs conform to federal requirements and support reductions in mobile source emissions.

Obective 4: Provide incentives to use transit and promote the usage of carpooling.

Obective 5: Establish regional passenger rail connections.

Priority 1: Southwest Arterial.

Goal 4: Preserve the existing transportation system.

Obective 1: Minimize the cost of the area's transportation systems through appropriate maintenance practices and the application of new technologies.

Obective 2: Develop monitoring systems which track the current status of the area's transportation systems.

Obective 3: Improve the reliability of the transportation system so that users can expect consistent travel times from day-to-day for the same trip on the same mode.

Obective 4: Prepare a Transportation Improvement Program (TIP) to balance roadway needs and priorities with fiscal constraints.

Goal 5: Promote a viable and livable region.

Obective 1: Explore new ideas for improving the DMATS area transportation system through transportation investments.

Obective 2: Assist with efforts to plan and implement transit-oriented development projects.

Obective 3: Support plans and programs that make walking and biking safer and more convenient.

Obective 4: Develop transportation system enhancements that improve regional livability.

Obective 5: Establish regional passenger rail connections.

Priority 1: Southwest Arterial.

The 2031 Long-Range Transportation Plan describes the current and future transportation needs of the DMATS area, and identifies the actions that must be undertaken to implement the above goals and objectives so that the area will promote a safe, continuous, comprehensive and coordinated transportation system.

Plan Content

The 2040 DMATS Long Range Transportation Plan lays out the avenue the metropolitan area wants to travel down in the next 30 years. This plan provides data analysis and recommendations that will guide the future transportation decisions made by the DMATS Tech and Policy Committees. The following is a brief overview of the contents of the 2040 LRTP.

Chapter 2 - DMATS Overview

Chapter 2 will provide a broad overview of the conditions in the DMATS area. The chapter will begin with an introduction to the people living in the DMATS area. This chapter will present current demographic and socioeconomic data including total population, age, race, and income. The chapter will also present forecasts of future population and employment for the next 30 years.

Chapter 3 - DMATS Transportation Network Overview

TChapter 3 will outline the roadway system in the DMATS area. Current travel demand, safety, and security data will be examined in this section. Alternative transportation modes will also be explored including: transit, bike and pedestrian, freight, and air transportation. The final section of the chapter will focus on several initiatives currently being undertaken within the area. These initiatives include Sustainability, Intelligent Transportation Systems, and Safe Routes to School.

Chapter 4 - Transportation Network Forecast

The objective of Chapter 4 is to provide a forecast of the transportation network to help evaluate future infrastructure investments. DMATS uses several methods for forecasting future transportation demand. For roads, DMATS uses a travel demand forecast model. For transit, bike and pedestrian, freight, and air transportation, a combination of public surveys and secondary data analysis are used to identify areas where transportation investment is needed. This chapter will provide a summary of the analysis methods, results from the analysis, and recommendations for the future based on the results

Chapter 5 - Public Input

Chapter 5 will outline the methods used to engage the public in the transportation planning process. Collecting input from the public is a crucial step in the long range panning process, as well as all other planning activities conducted by DMATS. For the 2040 LRTP update, DMATS staff held workshop meetings with local government officials, the Tri-State Trail Vision, several neighborhood associations, and the Transit Action Group. The public input process for the 2040 DMATS LRTP was completed in accordance with the DMATS Public Involvement Policy.

Chapter 6 - Safety and Security

Chapter 6 will outline the steps being taken in the DMATS area to address the safety and security of the transportation system. Under SAFETEA-LU, the safety and security factor reads, “Increase the safety of the transportation system for motorized and non-motorized users”, and “increase the security of the transportation system for motorized and non-motorized users.” The 2040 LRTP consolidates the safety and security components into this chapter.

Chapter 7 - Projects

Chapter 7 contains a list of the projects that were identified through the public participation process. For the 2040 LRTP the DMATS policy committee has chosen to address the future projects on a corridor level. In past LRTPs, each transportation mode had its own project list. While this approach communicated all of the necessary information, it did not effectively convey the relationships among multiple projects along the same corridor. This new method will allow DMATS to conduct corridor level analysis that will help the policy committee to examine the impacts of all modes on the transportation network.

Chapter 8 - Environmental

Chapter 8 includes a preliminary environmental screening of all projects listed in the 2040 LRTP. A preliminary environmental impact screening can identify potentially serious impacts that could delay or completely shut down a project. Identifying such issues in the early planning stages provides local governments with the opportunity to avoid or mitigate undesirable environmental impacts through modification or elimination of the project. This approach helps reduce the risks that are inherent in transportation planning process, and helps ensure that local governments do not waste time and resources unnecessarily.

Chapter 9 - Project Ranking

Under SAFETEA-LU, DMATS is required to produce financially constrained transportation plans. This means that the MPO must identify its priorities for the expenditure of federal funds that it can reasonably be expected to have access to in the 30-year plan time frame. The prioritization process divides the projects into real projects and illustrative projects. Chapter nine describes the process used to prioritize the projects.

Chapter 10 - Finance

Federal law requires that all plans prepared by metropolitan areas be fiscally constrained. The Finance chapter contains a 30-year budget for the projects presented in the 2040 LRTP The budget includes two parts. The first section is a forecast of the federal and local funds that will be available to DMATS and its members over the next 30 years. The second section includes the priorities for expenditure of federal funds as determined by the DMATS policy board.

Introduction

The DMATS travel demand model is a mathematical representation of travel behavior within the Dubuque metropolitan area. Travel behavior is made up of thousands of decisions made by individuals on how, when, and where to travel. These decisions are affected by many factors such as family situation, individual characteristics, available routes, and mode choices. The DMATS travel demand model will use demographic data to represent people's behavior in making transportation decisions. The model representations will be used to forecast future travel demand within the region. The total amount of transportation required to support activity in the DMATS region is measured in vehicle trips. The current number of vehicle trips is estimated using traffic counts and other observation methods. Future vehicle trips are forecasted using a travel demand model.

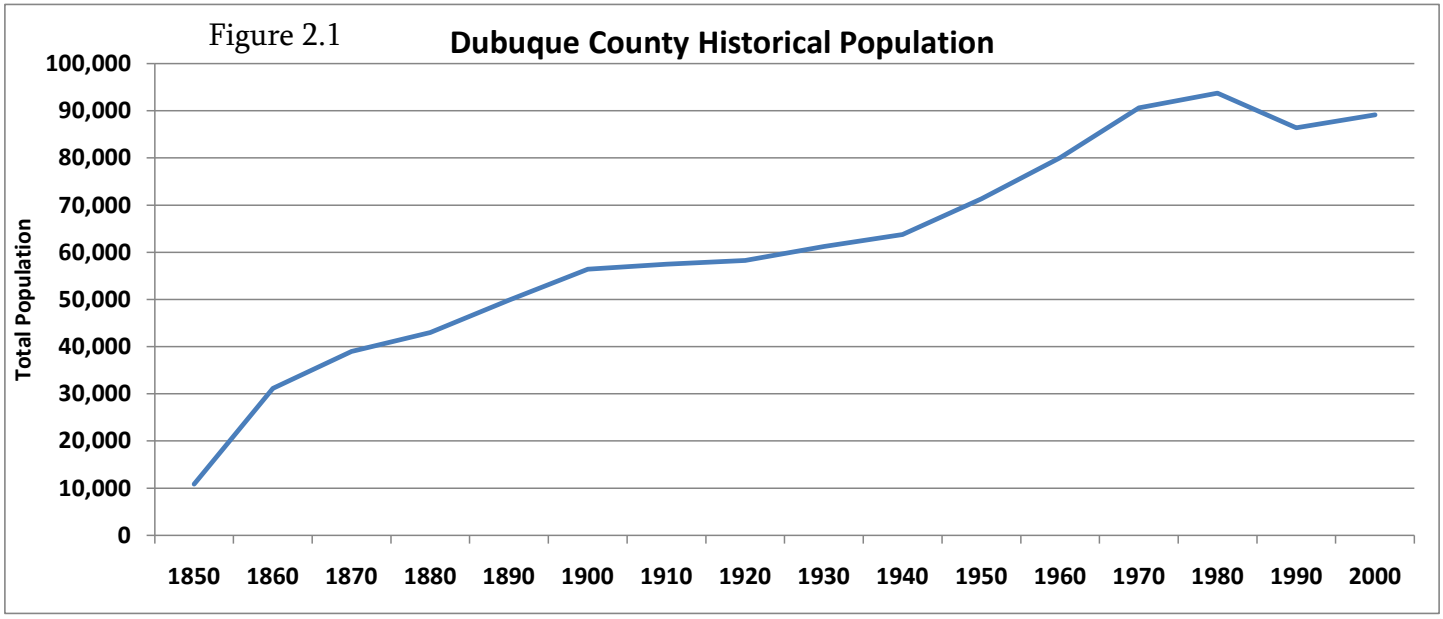
Data collection is the first step in building a model that accurately represents conditions in the DMATS area. Data used in the modeling process fits into two categories socioeconomic data and transportation network data. Chapter 2 will focus on the socioeconomic data by building a community profile. The chapter will include population, income, employment and minority population data. The community profile chapter will include both current data and 30 year projections. Transportation network data will be discussed in Chapters 3 and 4.

Population and Employment

The DMATS boundary was adjusted in 2002, which limits historical population analysis. Therefore, planners use Dubuque County's population data for examining historical population trends.

Figure 2.1 below shows the US Census Bureau's population data for Dubuque County from 1850 to 2000. For most of the last 150 years, the population of Dubuque County has grown steadily. In the 1980s the farm crisis caused Dubuque, and many other counties in Iowa, to lose population. Since 1990 the County has experienced population growth, however the growth has been at a slow rate.

Figure 2.1

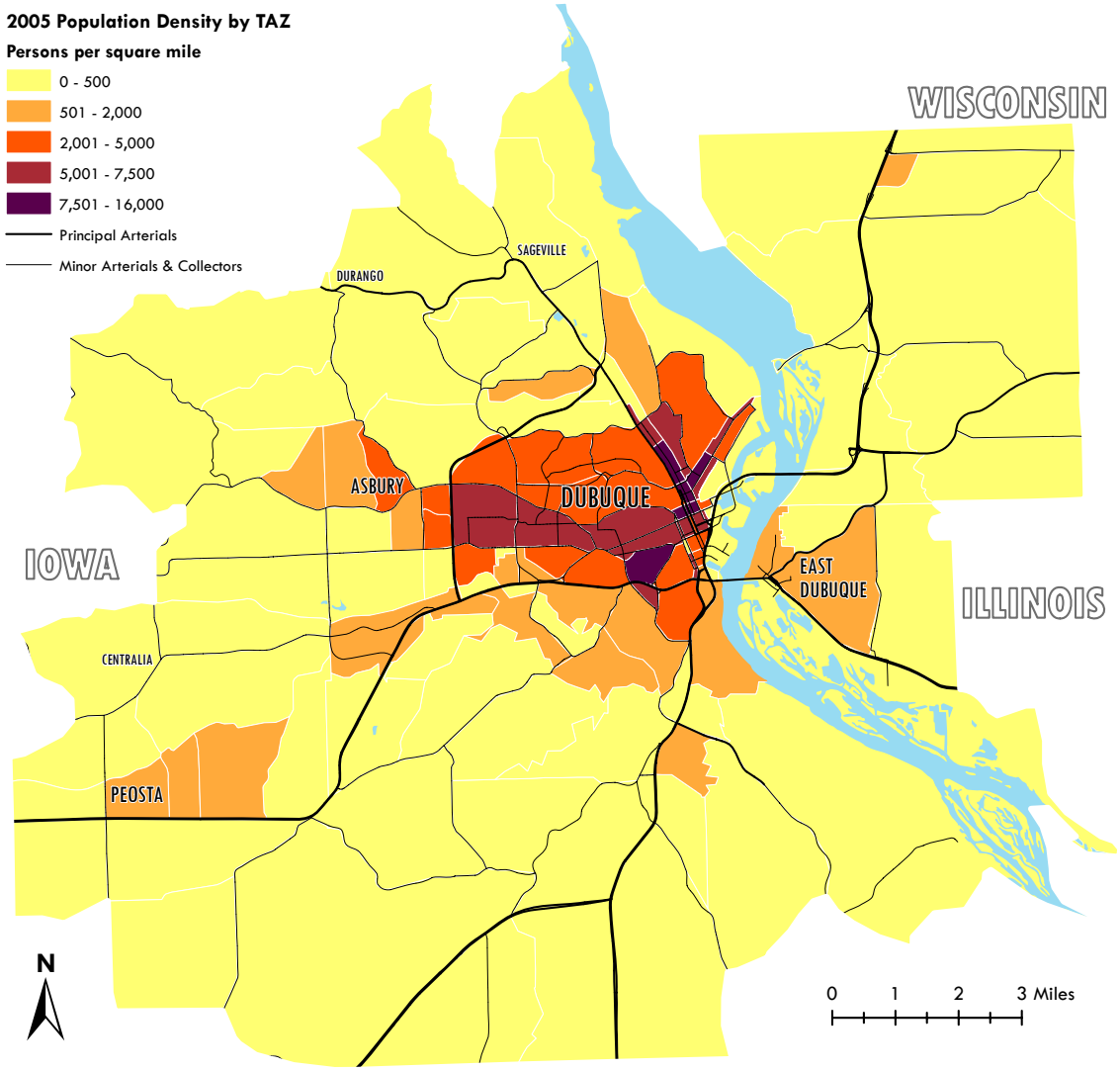


Source: US Census Bureau

Population Density

Figure 2.2 below displays population density in the DMATS area by traffic analysis zones (TAZs). TAZs containing higher population densities are expected to produce more vehicle trips.

Figure 2.2



Low Density Residential Development on Dubuque's West End

High Density Residential Development on Dubuque's North End

Population Forecasts

Accurate knowledge of future demographic conditions is vital to efficient distribution of transportation resources. DMATS relies on population forecast models to provide a picture of what future transportation demand might look like within the region.

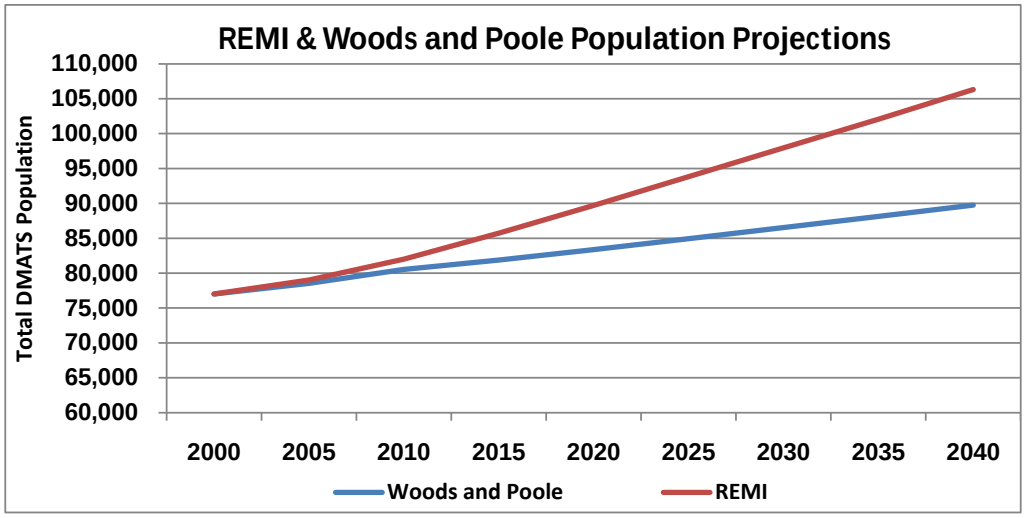
Prior to producing its own forecast, DMATS staff reviewed population forecasts produced for Dubuque County by Woods and Poole Economics, Inc. and Regional Economics Model, Inc. (REMI). In addition to historical population data, these forecasts provided DMATS staff with a starting point for its own forecast.

Woods & Poole county projections are updated annually and utilize county models that take into account specific local conditions based on historical data from 1969 to 2007 . County population growth is a function of both projected natural increase and migration due to economic conditions.

The REMI model incorporates aspects of four major modeling approaches: Input-Output, General Equilibrium, Econometric, and Economic Geography. The REMI integrated modeling approach builds on the strengths of each of these approaches.

Projections produced for Dubuque County by Woods and Poole and REMI are shown in figure 2.3. County growth rates were applied to the base year DMATS population to create a population for the area. There is a large difference between the two projections. REMI predicts a 2040 population of 106,326, while Woods and Poole only estimate 89,760.

Figure 2.3



Source REMI, Inc. and Woods and Poole Economics, Inc

DMATS Population Projection

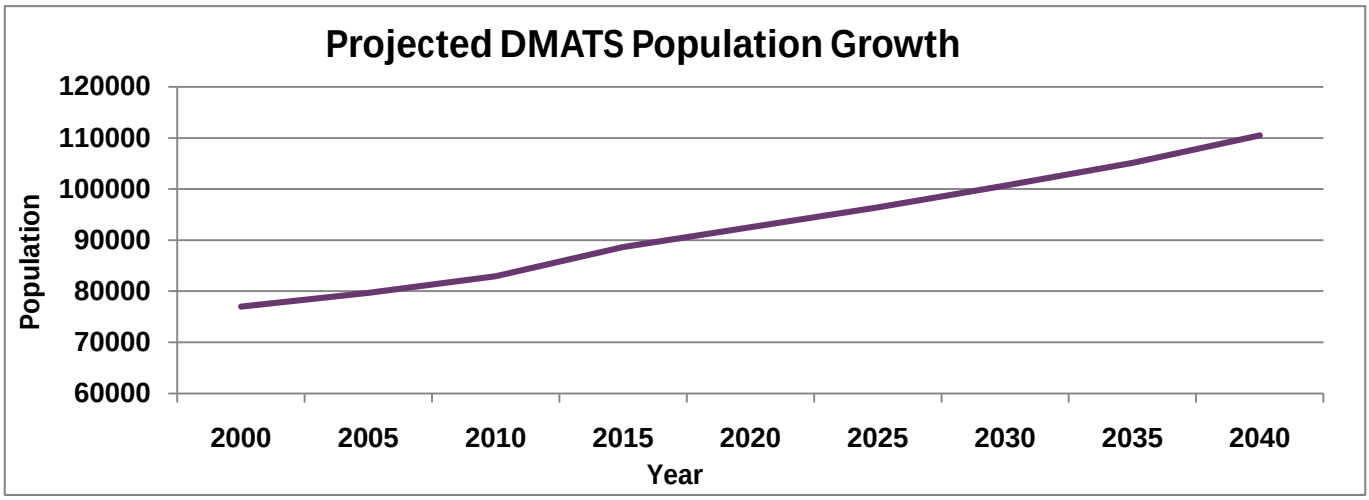
DMATS staff produced a population forecast for the year 2040 using the Age Cohorts Method. The cohorts method was chosen because, in addition to total population, the model produces forecasts for five year age groups. Dividing the population into five year age groups is important to the planning process because as people age, their transportation needs change.

Data used in the model comes from the US Census Bureau. The most recent census data comes from the year 2000, and as a result 2000 was used as the base year for the model. The Age Cohorts method is based on three components births, deaths, and migration. Calculation of the birth and death components is straightforward. Current birth and death rates are applied to the base year population data in five-year increments. Application of birth and death rates results in the population change from natural processes.

Migration is more difficult to calculate. Government agencies do not monitor people's movements closely, thus accurate migration data is difficult to find. For the 2040 forecast, staff estimated the migration component by forecasting the population of the DMATS area for 2005 using only birth and death data. The forecast was then compared to a 2005 US Census Bureau population estimate. The difference between the model forecast and the Census estimate was assumed to be a result of migration. The percent difference was applied throughout the model to estimate the impact of migration.

Following the initial model run, adjustments were made to the model assumptions. First, the new IBM employment center is expected to bring 1,300 new employees to the area. To account for new IBM employees in the model, 2,080[a] additional in-migrants were added to the 2010 forecast. Second, staff adjusted migration rates to reflect current trends more accurately. The initial migration rates were based on data from early 2000s when growth in the DMATS area was slow. Estimates from the US Census Bureau show that the DMATS area once again has positive net migration and growth rates have increased, so the model's migration rates were increased in reflect this change. The DMATS area population forecast is illustrated in figure 2.4.

Figure 2.4



Based on the results of the population forecast model, the population of the DMATS area is expected to increase steadily over the next 30 years. The DMATS area is expected to grow by approximately 1.2% annually, expanding from 83,056 in 2010, to 114,032 in 2040. The increase in the total population of the DMATS area will result in an increase in demand for all transportation sectors.

The 1.2% annual growth rate is much higher than the 0.41% annual growth rate projected by Woods and Pool Economics Inc. and slightly higher than the 0.95% annual growth rate forecast by REMI. (See graph on previous page.) The range of projections exists because of differences in available data, forecasting methods, and assumptions used to create the model. For example, the Woods and Pool projection is based on historical population trends from the 1990s and 2000s when the County's population growth was slow. The DMATS projection assumes that future growth rates will exceed those of the recent past because of the new initiatives and development that have occurred within the region during the last five years.

a. The population increase as a result of new IBM employees was estimated by multiplying the number of additional employees by the ratio of population to jobs (0.625) for the area.

Figure 2.5

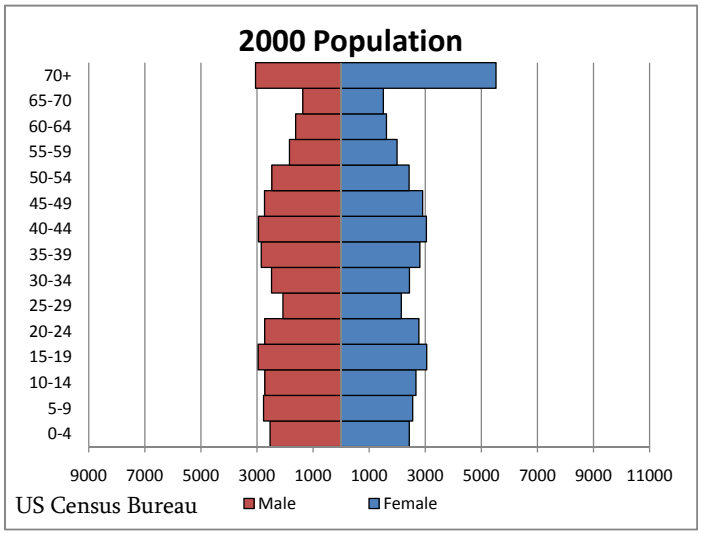
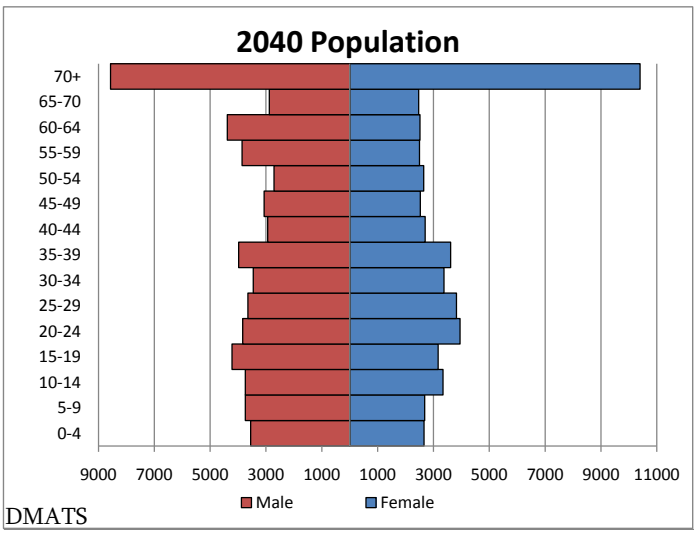
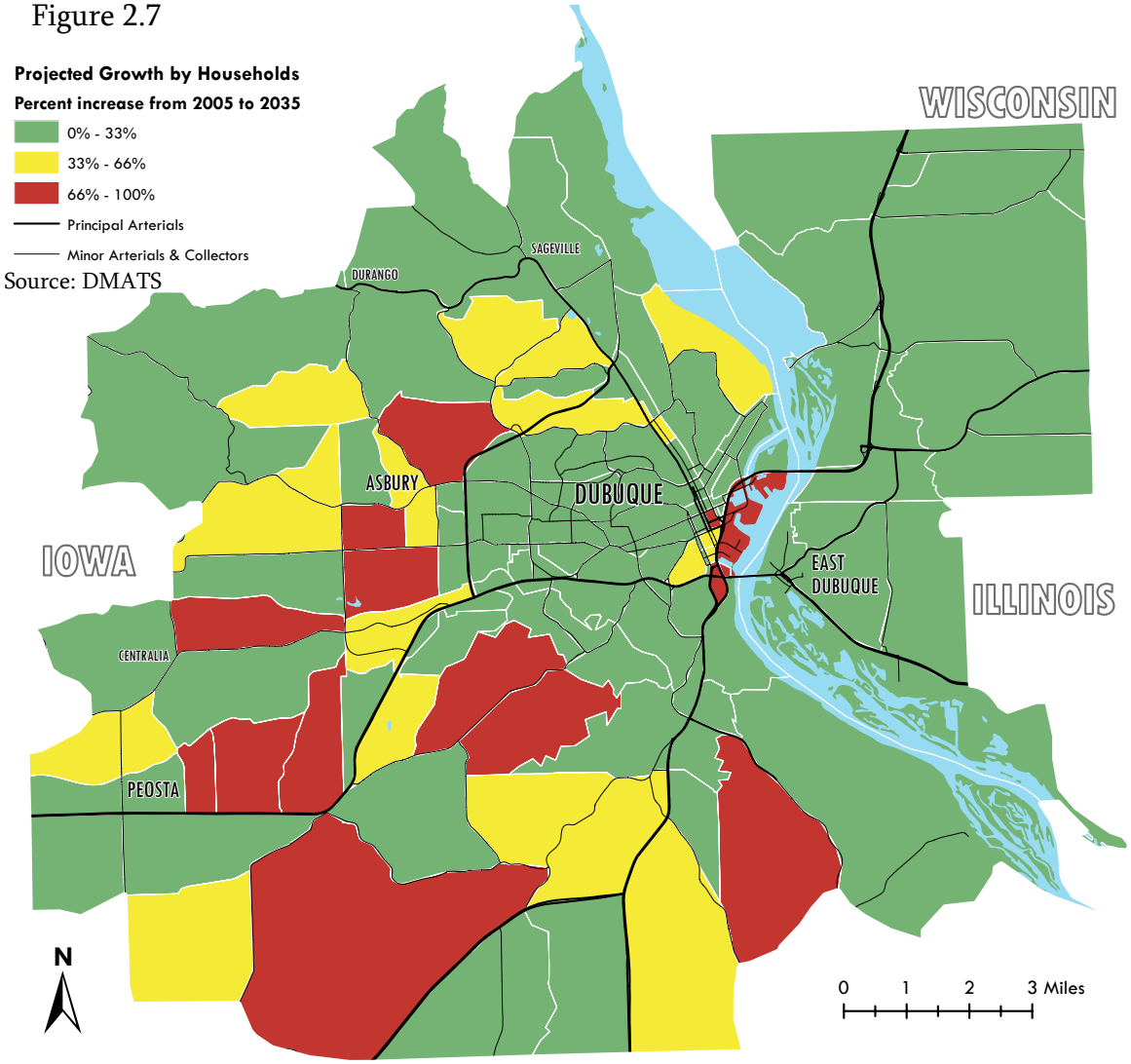


Figure 2.6



Figures 2.5 and 2.6 demonstrate that the 70+ cohort will have grown from 8,581 in 2000 to just over 19,311 in 2040. Many members of this cohort are unable to drive, and as a result rely on family, friends, or transit services to get where they need to go. The increase in the elderly population will require an increase in transit capacity over the next 30 years. Figure 2.7 below displays the projected location of that population growth by TAZ.

Figure 2.7



Employment Projections

Monitoring the number and location of jobs in the DMATS area is critical to the long range planning process. Jobs attract people from all over the region, so knowing where jobs are located can help DMATS model travel patterns in the area.

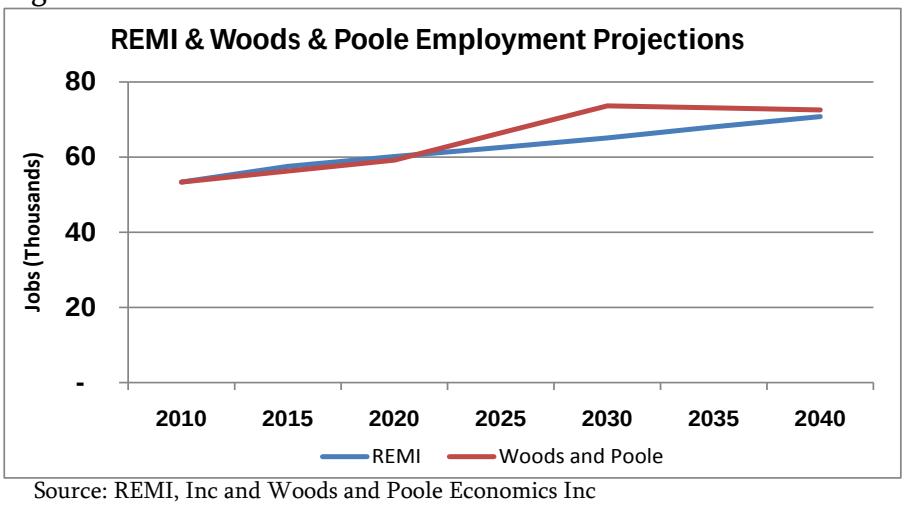
As of the 2000 Census there were 46,754 total jobs in the DMATS area. Estimates of current employment in the DMATS area put the total number of jobs for 2010 at 53,346.

Employment forecasts for the DMATS area are based on economic forecasts developed for Dubuque County by Woods and Poole Economics, and by Regional Economic Model, Inc. (REMI). REMI and Woods and Pool projections can be found in Figure 2.8. It was assumed that the forecasted growth rates for Dubuque County would be representative of the DMATS area.

To create the projection, DMATS staff used a linear growth rate similar to the one projected by REMI. Growth rates for each industrial category were applied to base year employment data that was collected from employment development agencies in each of the three states. 1,300 additional employees were added to account for new IBM workers. See figure 2.9 and for the DMATS projection.

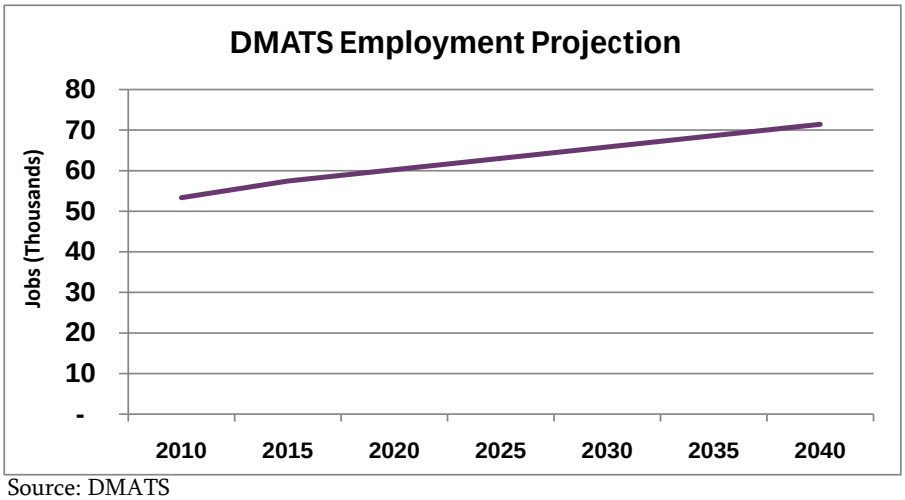
Total employment is projected to increase from 53,346 in 2010 to 71,446 in 2040, an increase of approximately 34%. The largest increases over this period are expected in the non-retail sector. This sector includes industries such as agriculture, construction, and manufacturing. See Figure 2.10.

Figure 2.8



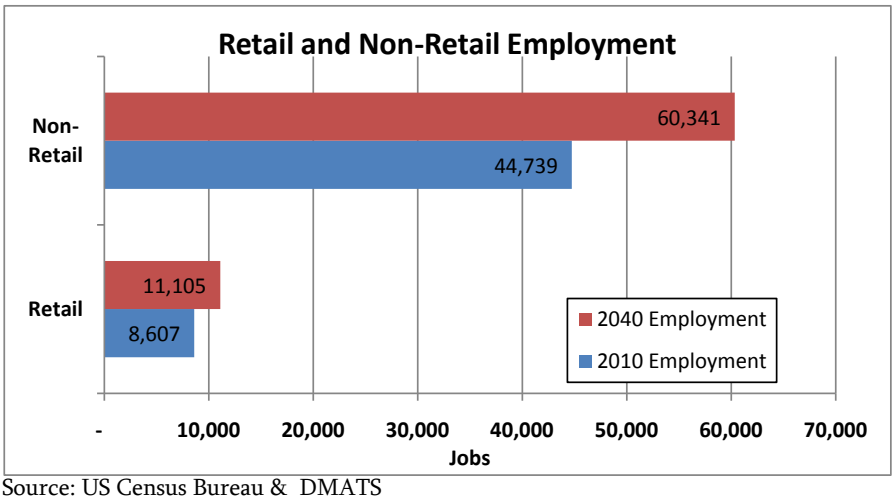
Source: REMI, Inc and Woods and Poole Economics Inc

Figure 2.9



Source: DMATS

Figure 2.10

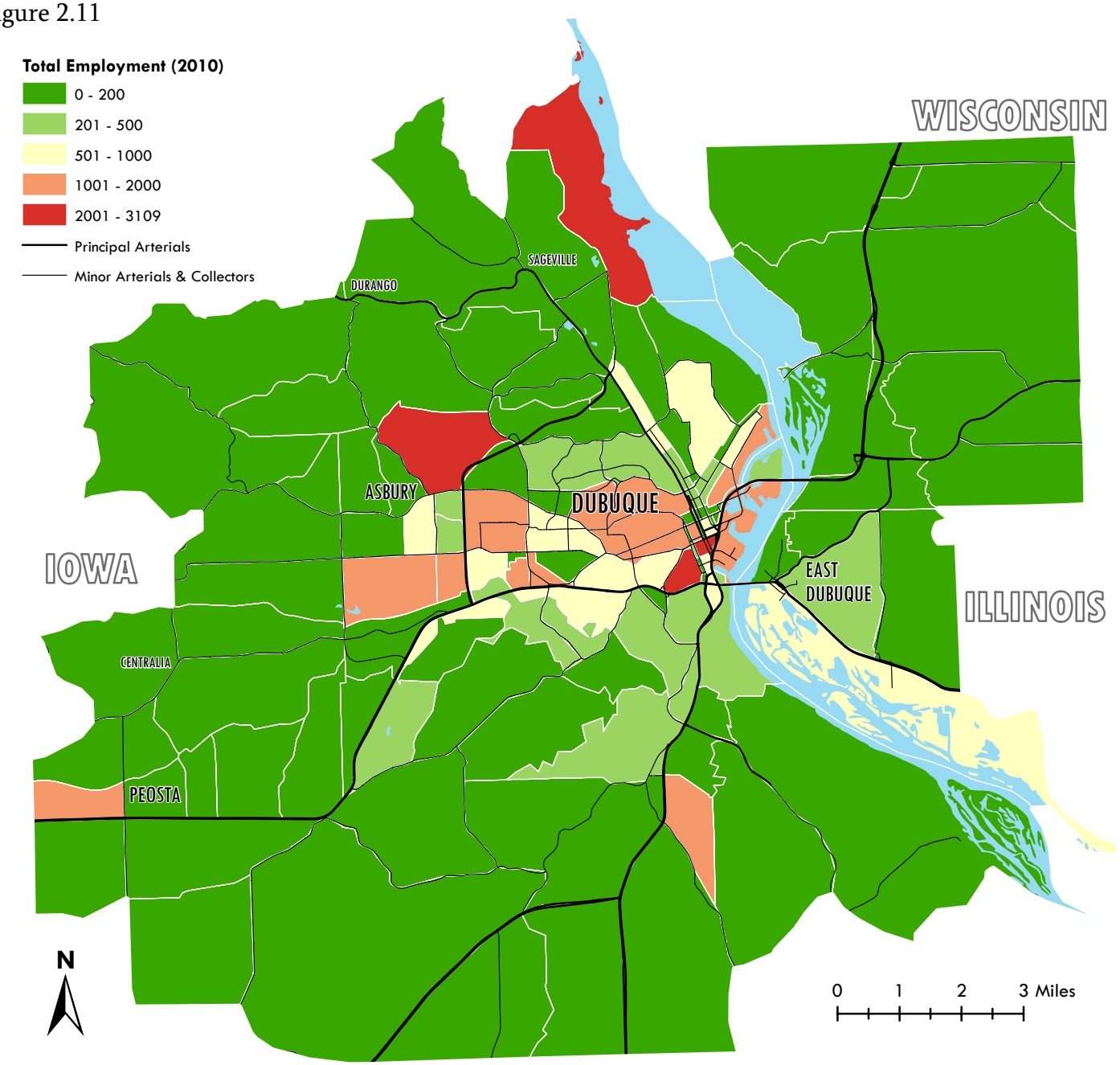


Source: US Census Bureau & DMATS

Employment Distribution

Distribution of employees affects traffic flow in the DMATS. The majority of vehicle trips are between home and work. Figure 2.11 shows the distribution of employment throughout the DMATS area by Traffic Analysis Zone (TAZ).

Figure 2.11



Source: US Census Bureau

Income

Income is one of the most important components to individual mobility. The automobile is the most popular mode of transportation in the DMATS area, but for some owning and operating a vehicle is too expensive. Low-income families are often dependent on public transportation, walking, and bicycling, so knowledge of size and location of the low income population is vital to the long range planning process.

Source: US Census Bureau

Figure 2.12

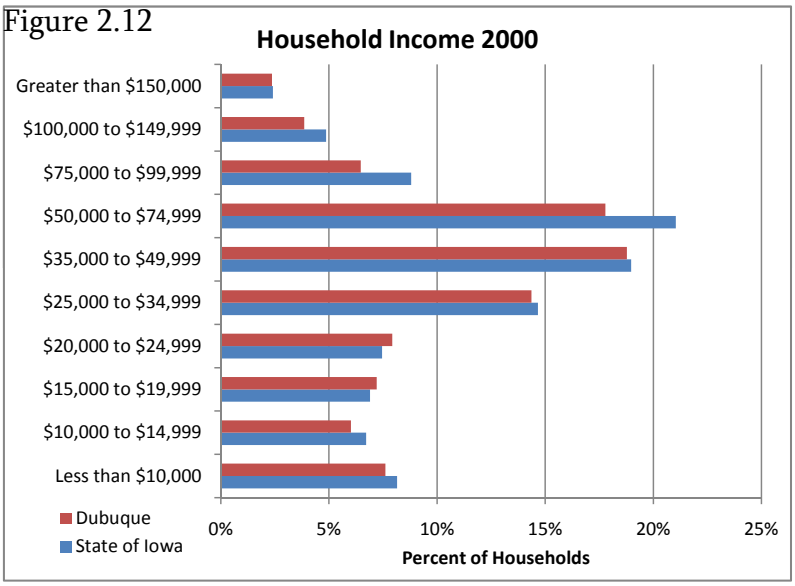
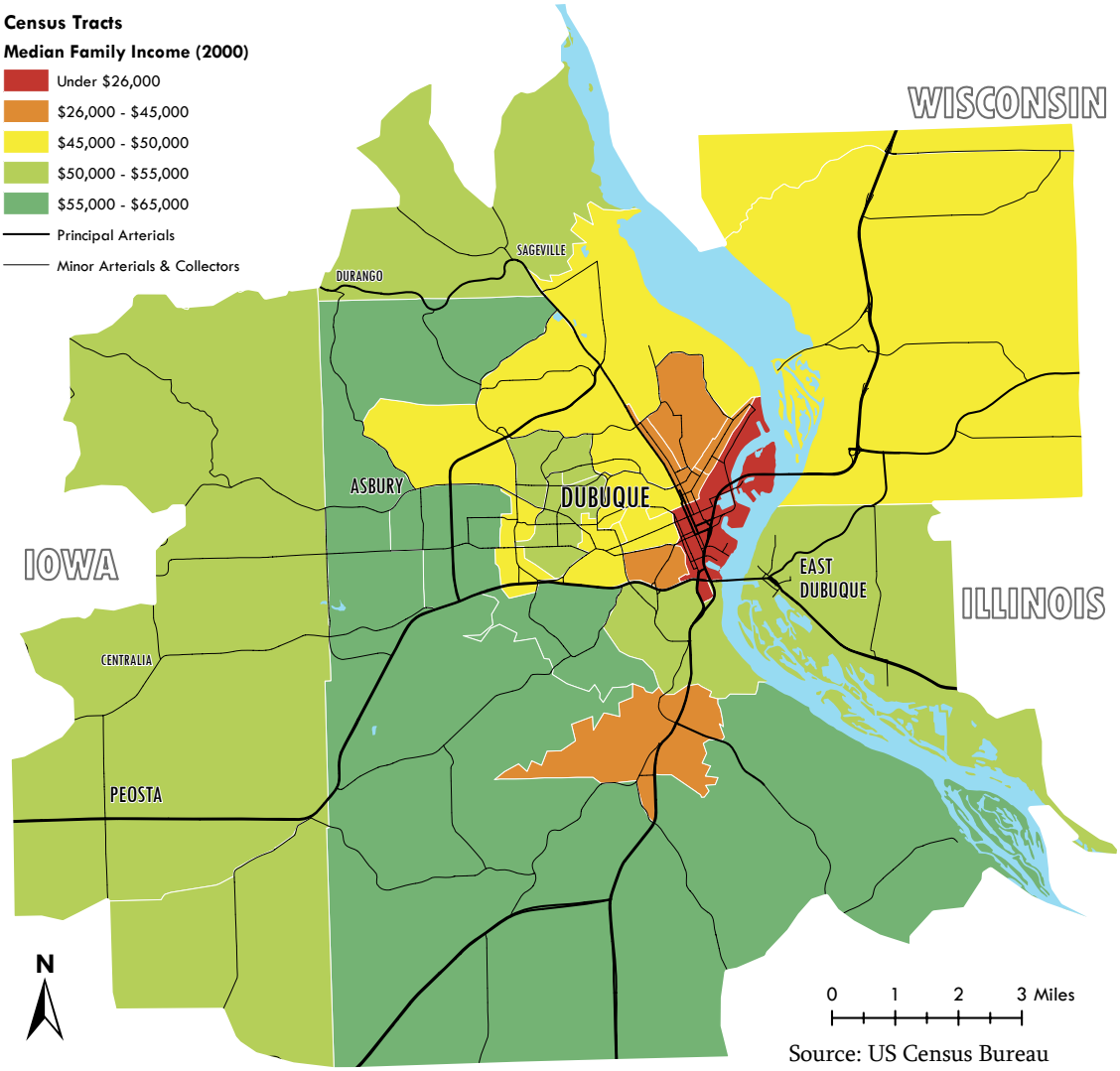


Table 2.1

Median Household Income	Dubuque County	State of Iowa
1990 (1999 Dollars)	$37,990	$35,240
2000 (1999 Dollars)	$39,582	$39,469
% Change	4.0%	10.7%

Median income in Dubuque County increased by 4.0% between 1990 and 2000. During the same period the state of Iowa's median income grew by 10.7%. Figure 2.12 above shows the income distributions for the DMATS area and the State of Iowa. Figure 2.14 displays the spatial distribution of family incomes within the area.

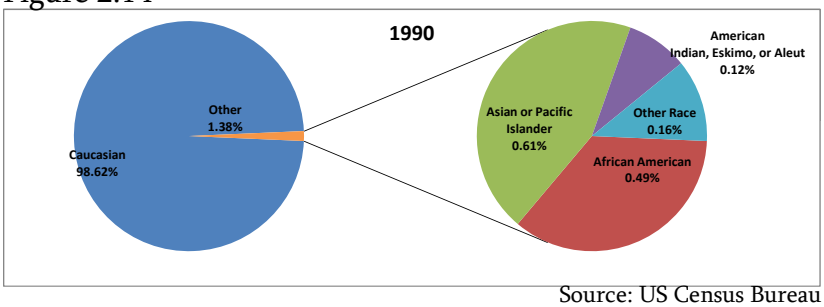
Figure 2.13



Source: US Census Bureau

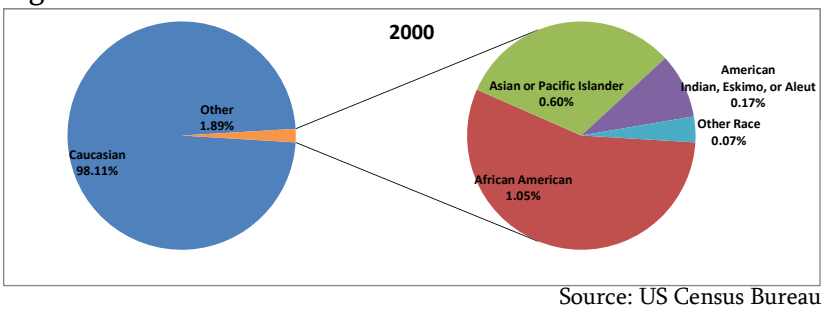
Minority Populations

Figure 2.14



Source: US Census Bureau

Figure 2.15



Source: US Census Bureau

Non-Caucasians make up a very small segment of the DMATS areas population. All other races combined made up less than 2% of the population in 2000. Accounting for minority populations is important to the long range planning process because minority populations often have disproportionately lower household incomes that limit their mobility.

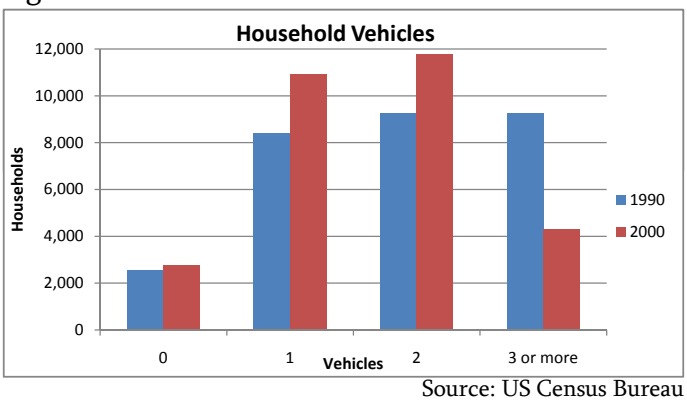
The minority population in the DMATS area increased only slightly between 1990 and 2000. African American population did grow slightly, expand from less than half of one percent of the total population in 1990 to just over one percent in 2000. See Figures 2.14 and 2.15.

Vehicles Available to Households

Knowledge of the number of vehicles available to households can help determine the need for bicycle, pedestrian, or transit services. Figure 2.16 shows the number of vehicles available to households in the DMATS area for 1990 and 2000. Approximately 9.28% of DMATS residents did not have a vehicle available in 2000. This was up from 8.58% in 1990.

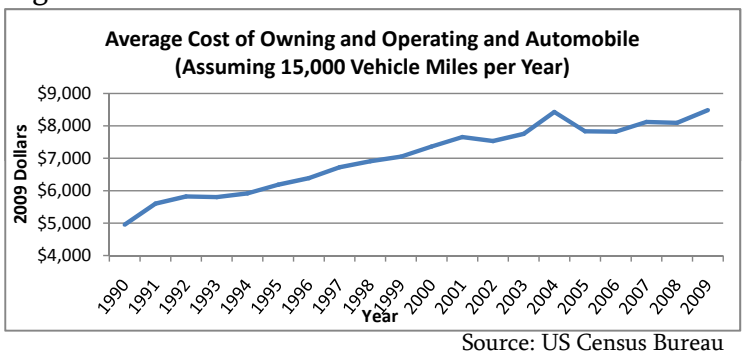
Part of the reason for the increase in no-vehicle households can be seen in Figure 2.17. Since 1990 the average inflation adjusted cost of owning and operating a vehicle has risen steadily from just below $5,000 in 1990 to just under $8,500 in 2009.

Figure 2.16



Source: US Census Bureau

Figure 2.17



Source: US Census Bureau

Introduction

The socioeconomic data collected in Chapter 2 can be used to represent the travel activities of the area's residents. The next step is to study the transportation network on which these activities will take place.

Chapter 3 will present the DMATS area transportation network profile. The primary goal of the profile is to assess the current condition of the transportation network in the DMATS area. The profile will focus on personal vehicles and the road network, as it is the predominant mode of transportation in the area. Data on current traffic volumes, levels of congestion, and vehicle crash data will be presented in the roadway section of the chapter. This chapter will also focus on other modes of transportation including public transit, bicycle and pedestrian, freight, and air travel. The final section of the chapter will focus on several initiatives currently being undertaken within the area. These initiatives include Sustainability, Intelligent Transportation Systems, and Safe Routes to School.

Chapter 3 will focus on presenting data on the current state of the DMATS transportation network. The travel demand forecast model will be calibrated to align with this current data. Chapter 4 will present the results from the model.

Roads

The predominant transportation system in the DMATS area, as in the rest of the United States, is a network of streets and highways that are used by automobiles and trucks. These roadways serve the circulation needs of local residents, employers, and people traveling from outside the area. The following describes the roadway system in the DMATS area in terms of its functional classification, existing capacity, congestion, and safety.

Functional Classification

Functional classification describes roadways based on the type of service which they provide. Roadways provide two basic types of service: land access and mobility. The degree to which a roadway provides access and/or mobility determines its functional classification. The key to planning an efficient roadway system is finding the appropriate balance between mobility and accessibility. The following defines the functional classifications found in the DMATS area.

Principal Arterial roadways primarily serve a mobility function with minimal land access. The primary purpose of principal arterials is the rapid movement of people and goods for extended distances. Principal arterials are high capacity, high speed roadways with restricted access. US 20 west of Swiss Valley Road in Dubuque County is an example of a principal arterial in the DMATS area.

Minor Arterials interconnect with and augment principal arterials. Minor arterials within urban areas serve inter-community trips of moderate length. Although the primary use of the minor arterial is mobility, this functional class provides more access points and more land access than a principal arterial. John F. Kennedy Road in the City of Dubuque is a local example of a minor arterial.

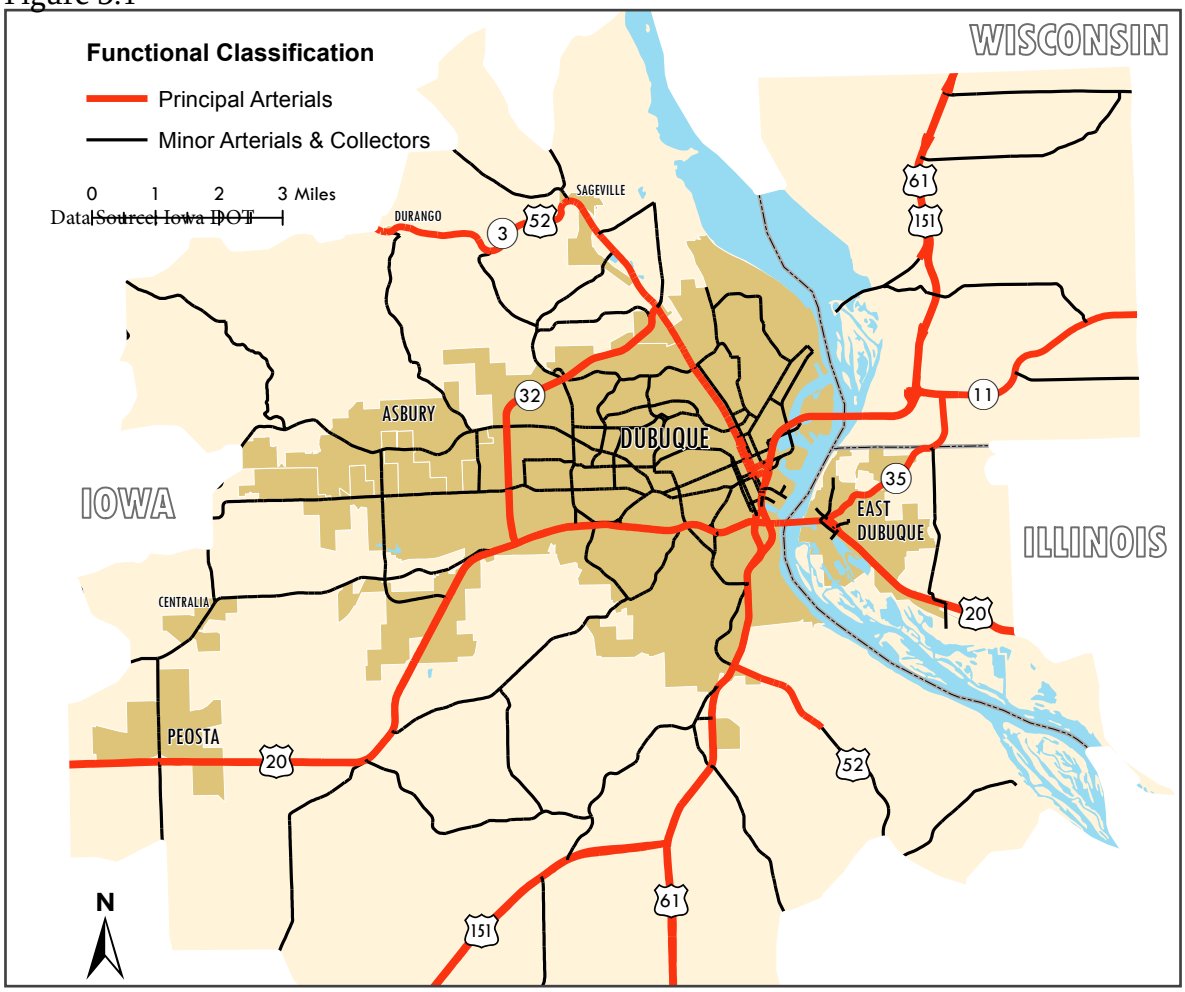
Major Collector streets channel trips between the local street system and the arterials. Major collectors serve a balance between mobility and land access. Parking and direct driveway access to the street are typically allowed on major collectors. Collectors are usually wider, have higher capacity, and permit somewhat higher speeds than the local street network. Chaney Road in the City of Dubuque is designated as a collector street.

Minor Collectors & Local Streets primarily provide local land access and offer the lowest level of mobility. Characteristics of local streets include uncontrolled intersections, posted speed limits of 25 miles per hour or less, and few restrictions on parking. Local streets are not a significant consideration in metropolitan planning and will not be addressed in any systematic fashion in this plan. Local streets include all other streets that are not classified as interstate, principal arterial, minor arterial or collector. Table 3.1 and Figure 3.1 describes all the roadways in the DMATS area in terms of functional classification.

Table 3.1	Lane Miles	Annual Average Daily Traffic	Vehicle Miles Traveled
Principal Arterials	128.2	3,741,294	990,743
Minor Arterials	52.7	4,030,103	368,510
Major Collectors	69.6	829,562	198,680
Minor Collectors & Local Streets	87.3	624,724	126,594

Data Source: Iowa DOT

Figure 3.1



Roadway Use

Figure 3.2

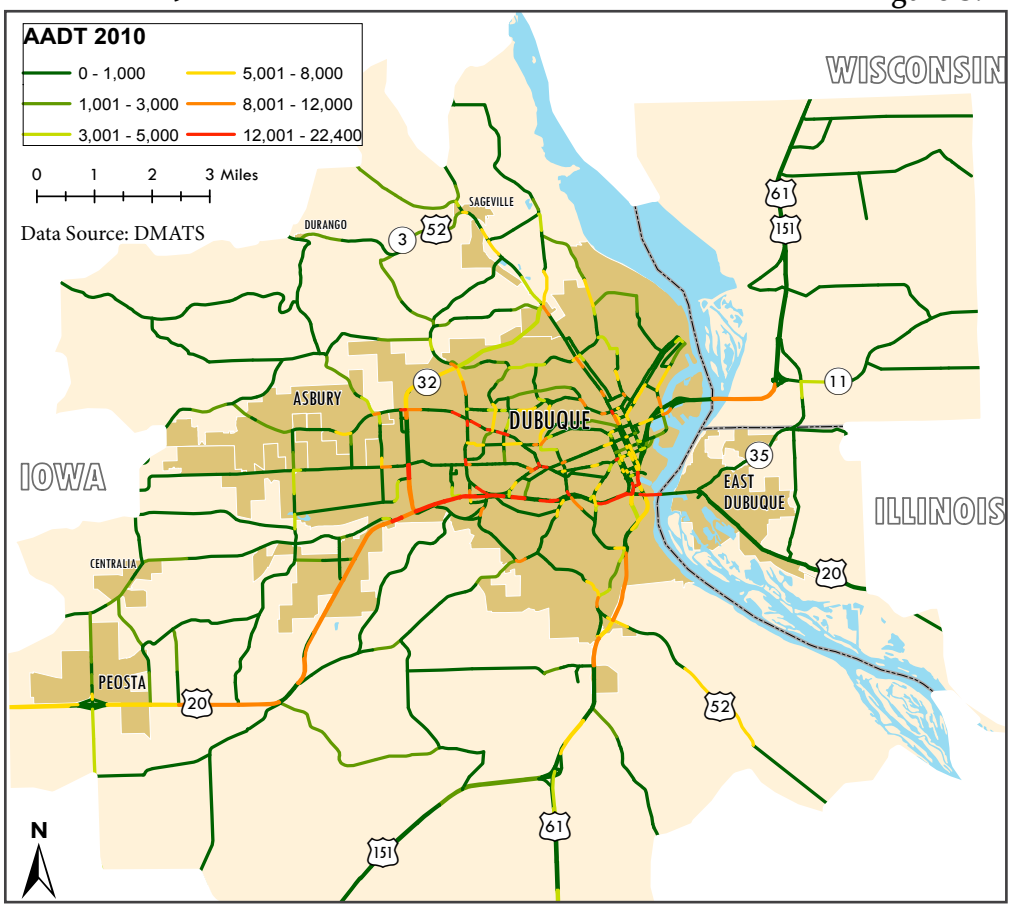
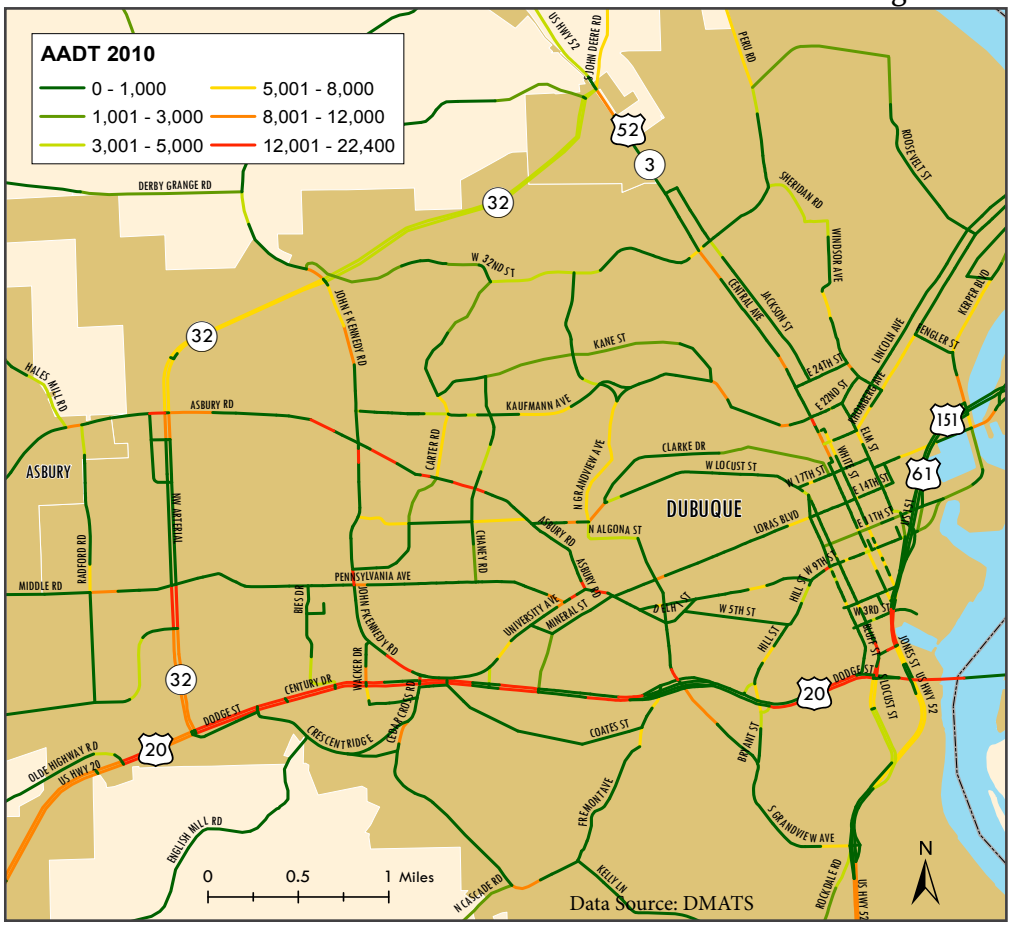


Figure 3.3



Traffic Volume 2010

Transportation planners most often use average annual daily traffic (AADT) to measure the use of the roadway system. AADT is an annualized measure of traffic volume on a road segment. AADT numbers are based on traffic counts.

Local and Iowa DOT engineers periodically collect traffic count data on all road segments. Traffic counts provide a onetime "snapshot" view of traffic on a road segment. Engineers use mathematical processes to extrapolate several snapshots into an annualized daily average. Data used in the DMATS 2040 LRTP comes from the Iowa DOT's 2009 Annual Average Daily Traffic Count, which was conducted in the summer of 2009.

Figures 3.2 and 3.3 display the 2010 traffic volumes from the Iowa DOT Annual Average Daily Traffic Count. Figure 3.2 displays the AADT for the entire DMATS area. Figure 3.3 shows traffic volumes within the city of Dubuque.

Figure 3.4

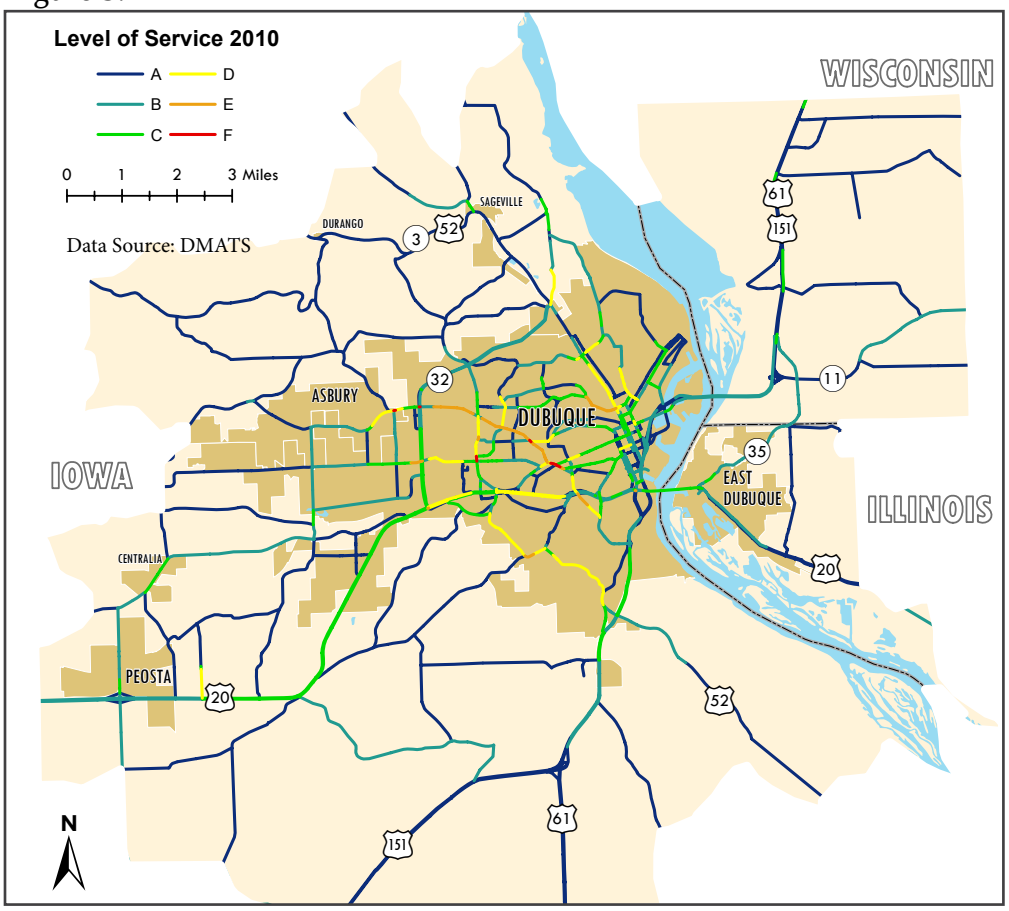
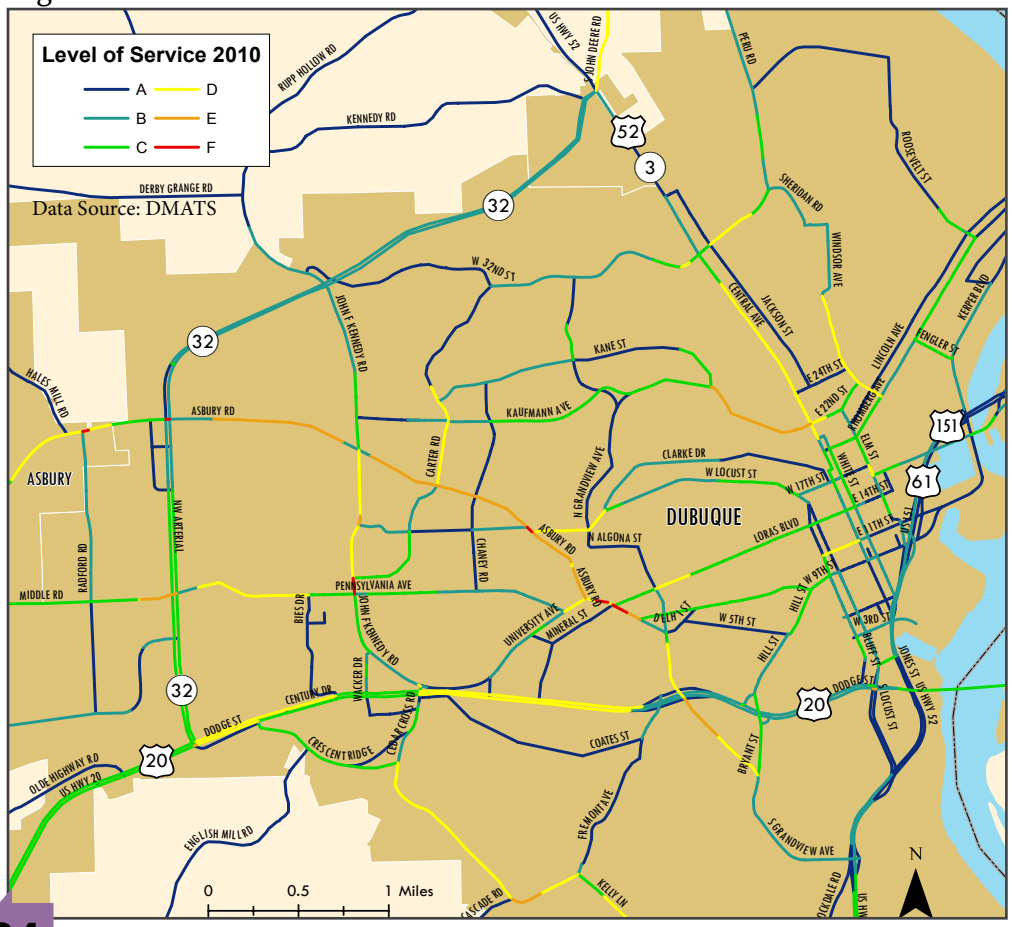


Figure 3.5



Level of Service 2010

Level of Service (LOS) is a qualitative measure describing conditions within a traffic stream, based on speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience

LOS is determined by calculating the Volume to Capacity (VC) ratio, where the traffic volume, observed or forecasted, is divided by the estimated capacity of the roadway. LOS "A" represents complete free flow of traffic, allowing traffic to maneuver unimpeded. LOS "F" represents a complete breakdown in traffic flow, resulting in stop and go travel.

Congestion

Figures 3.4 and 3.5 are used to identify road segments that are at or approaching capacity.

LOS D
- US Hwy 20
- Central Ave
- Windsor Ave
- N Cascade Rd/Kelly Ln
- Thunder Hills Rd

LOS E
- Asbury Rd
- Fremont Ave
- Kaufman Ave
- S Grandview Ave

LOS F
- Asbury Rd/Univeristy Ave
- Asbury Rd/NW Arterial Intersection
- Asbury Rd/Radford Rd Intersection

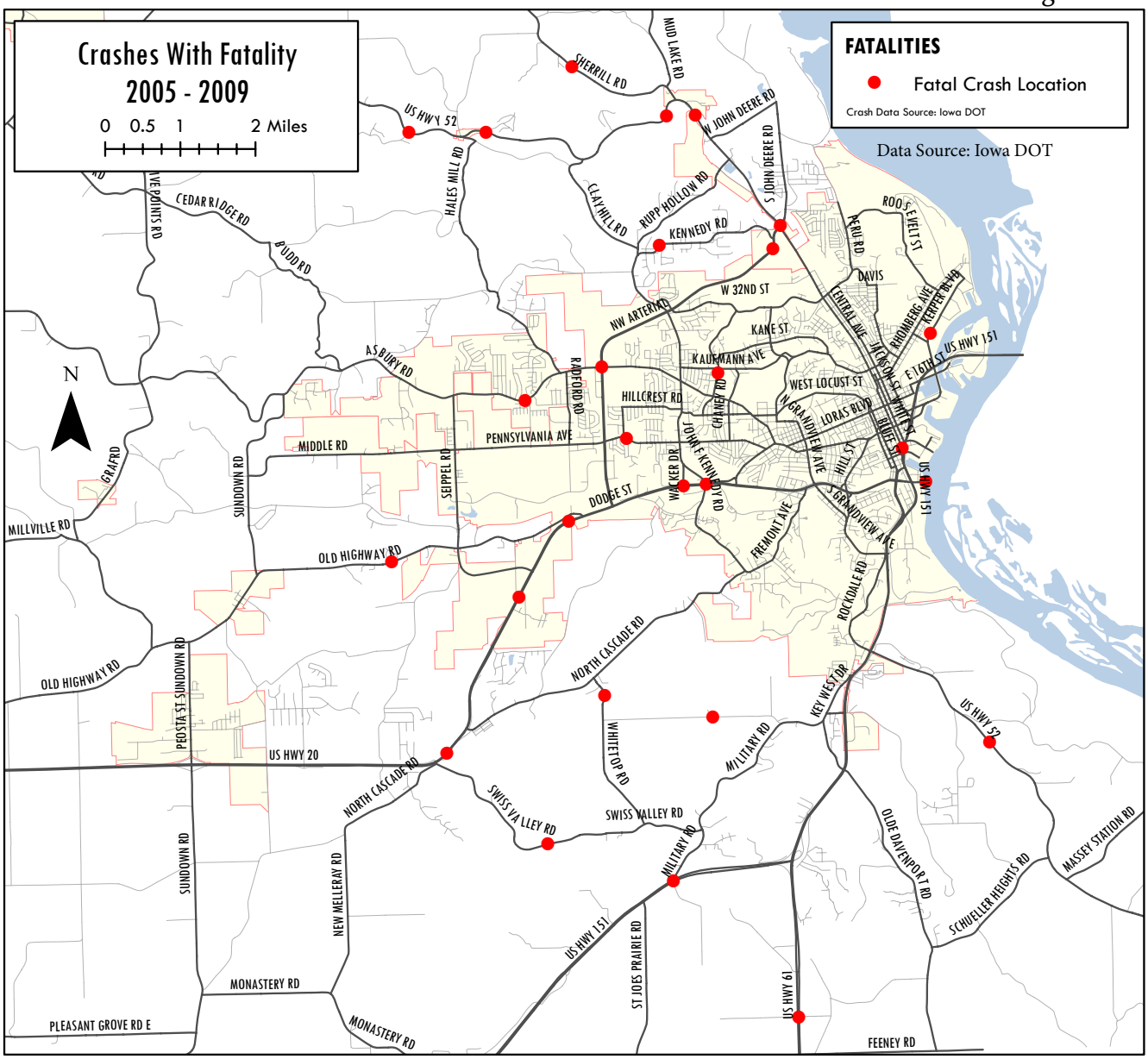
Crash Data

Crash data was acquired from the Iowa Department of Transportation for the Iowa portion of the DMATS region. Looking at five years (2005-2009) of crash data, maps were created to illustrate the distribution of fatal crashes and locations experiencing more crashes than would normally be expected.

Figure 3.6 shows all the fatal crash locations from 2005-2009. Of the 27 fatal crashes shown on the map, nearly one third have occurred on two main corridors. On US 20 (Dodge Street) there have been six fatal crashes from North Cascade Rd to the Julien Dubuque Bridge. US 52 has had five fatal crashes from North-west Arterial to west of the City of Durango. Despite nearly matching the number of fatal crashes on US 20, US 52 has substantially lower traffic volumes.

To illustrate where clusters of crashes have occurred, 30 foot buffers were created in GIS around each crash point location. Any overlapping buffers were then merged together to create a cluster region. Then the number of crashes occurring in the cluster region were calculated. Figure 3.7 illustrates which areas had the highest concentration of crashes in the five year period. For better clarity, all clusters with fewer than 10 crashes in them were excluded from the map. The ten clusters with the most total crashes are illustrated in the table below the map.

Figure 3.6



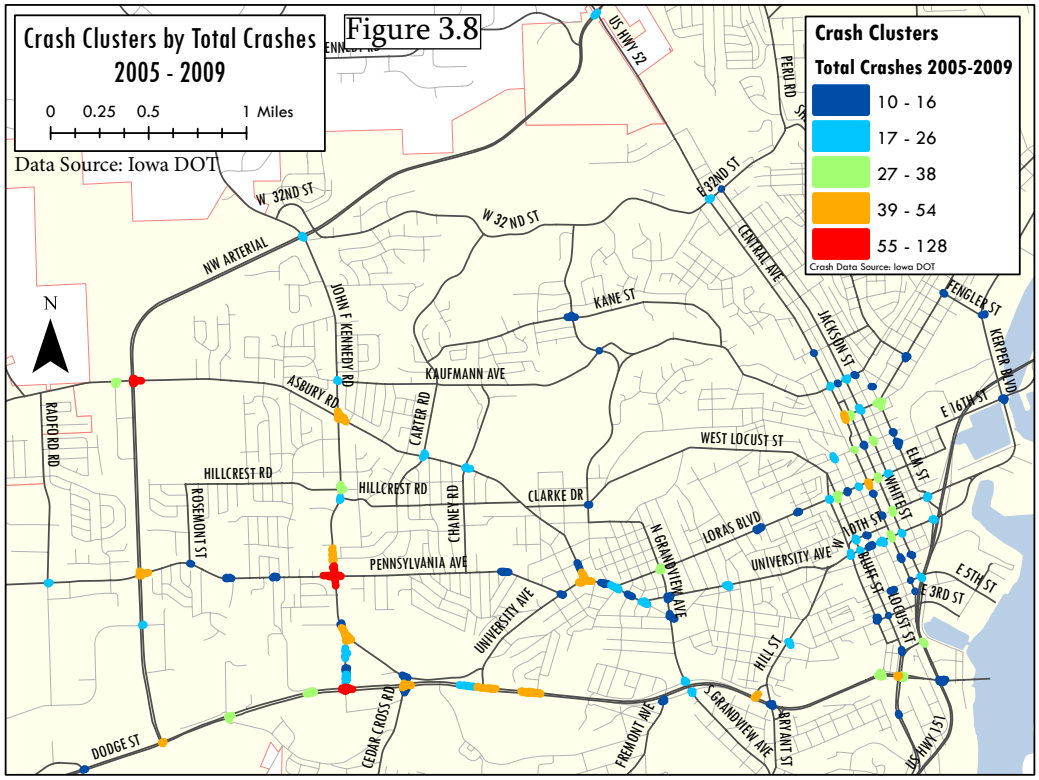


Figure 3.8

Using the same clusters with 10 or more crashes, the areas with the most severe crashes were examined. Using the 1 through 5 severity values recorded in the crash database (1 = fatality, 2 = major injury, 3 = minor injury, 4 = unknown injury, 5 = property damage only), an average score was calculated to produce a severity score. Lower severity scores indicate more severe crashes. Figure 3.8 shows the results of the average severity score calculations. Tables 3.2 and 3.3 contain the top twelve clusters that recorded the worst scores.

Table 3.2 Worst Severity Score 2005-2009

	CLUSTER LOCATION	SEVERITY SCORE
1.	Intersection of NW Arterial & US 52	4.18
2.	Intersection of Elm St & E 21st St	4.18
3.	Intersection of JFK Dr & Stoneman Rd	4.20
4.	Intersection of JFK Dr & NW Arterial	4.24
5.	Intersection of Elm St & E 17th St	4.27
6.	Intersection of Asbury Rd & Carter Rd	4.28
7.	Intersection of Loras Blvd & Iowa St	4.36
8.	Intersection of JFK & Hillcrest Rd (unsignalized)	4.38
9.	Intersection of White St & E 17th St	4.38
10.	Intersection of Dodge St & Crescent Ridge	4.38
11.	Intersection of Rhomberg Ave & Windsor Ave	4.38
12.	Intersection of Jackson St & E 14th St	4.39

Data Source: Iowa DOT

Table 3.3 Most Total Crashes 2005-2009

	CLUSTER LOCATION	TOTAL CRASHES
1.	Intersection of JFK Rd & Pennsylvania Ave	128
2.	Intersection of NW Arterial & Asbury Rd	75
3.	Intersection of Dodge St & Wacker Dr	73
4.	Dodge St at Devon Dr	54
5.	Dodge St at Hill St Ramp	53
6.	Intersection of Dodge St & Locust St	52
	Intersection of University Ave & Asbury Rd	52
8.	JFK Rd North of Pennsylvania Ave	50
9.	Intersection of NW Arterial & Pennsylvania Ave	48
10.	Dodge St at University Ave Extension	47

Data Source: Iowa DOT

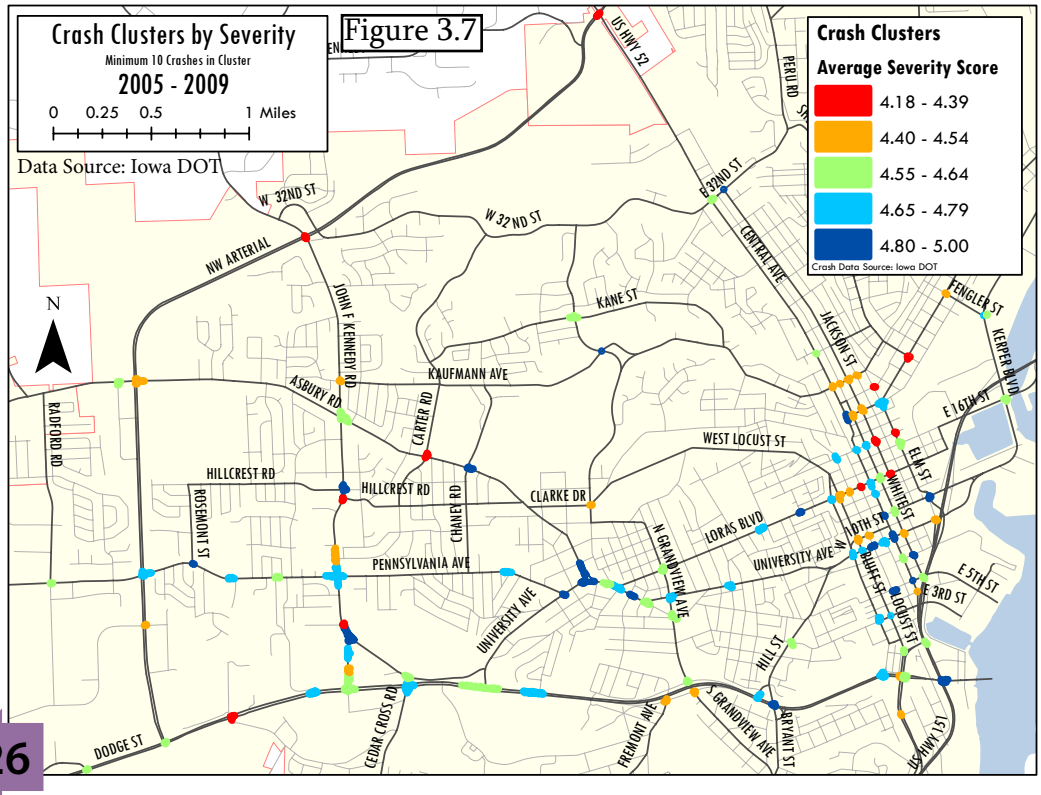


Figure 3.7

On first examination there appears to be no overlap between the top crash clusters with the most total crashes, and top crash clusters with the worst severity scores.

The clusters with the most total crashes appear to mainly occur along the busiest corridors in the DMATS region. The clusters with the worst severity scores appear to occur more in the dense urban core of the downtown area. A handful of crashes occur at unsignalized intersections.

Transit

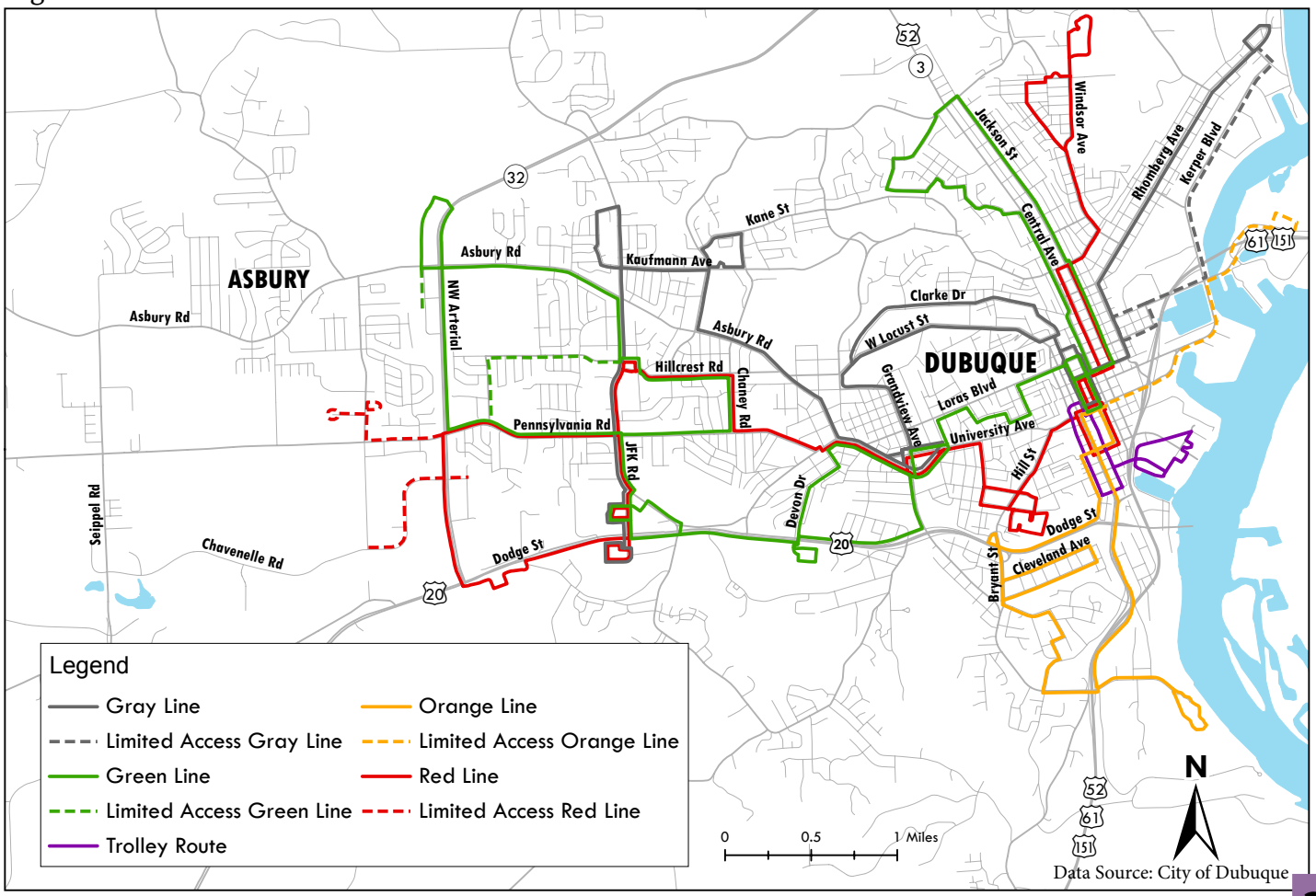
The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) requires Metropolitan Planning Organizations (MPO's) to consider all modes of transportation when formulating metropolitan transportation plans and programs. These plans and programs can then lead to the development and operation of an integrated, intermodal transportation system that facilitates the efficient movement of people and goods.

Transit Providers

The DMATS Area is served by four transit providers. The Jule (formerly known as Keyline Transit) serves the City of Dubuque, Iowa and the City of East Dubuque, Illinois. Dubuque County is serviced by Region 8 Regional Transit Authority (RTA). Grant County,Wisconsin has transit service operated by the Grant County Center on Aging. Finally, Jo Daviess County in Illinois has service provided by Jo Daviess County Workshop.

The Jule provides public transportation for citizens to and from their destinations on fixed routes and door to door services. The Jule currently operates seven fixed route lines within the city limits of Dubuque (see Figure 3.9). Fixed route service provides Dubuque citizens access to services, shopping, entertainment, community functions, and employment opportunities within the City. The Jule operates a fleet of (14) 30-35' fixed route buses all equipped with ADA accessible lifts. Fixed route hours of service are from 6:00 a.m. to 6:20 p.m., Monday through Friday and from 8:00 a.m. to 5:30 p.m. Saturday. The City of East Dubuque, Illinois has a contract with The Jule to provide demand response transit services within its city limits. Demand response transit service is comprised of vehicles operating in response to calls from passengers to the transit operator, who then dispatches a vehicle to pick up the passengers and transport them to their destinations.

Figure 3.9



The Jule's minibus provides seniors and persons with disabilities with demand response transportation and passenger assistance anywhere within Dubuque city limits. The minibus is available to anyone over the age of 18 with a documented disability. The minibus is available Monday through Friday between 6:20 a.m. and 6:00 p.m. and Saturdays between 7:50 a.m. and 5:30 p.m. The Jule currently operates 10 ADA accessible light duty buses. Cost is $1.00 per one way ride for all certified ADA customers ($0.50 per one way ride for eligible passengers with disabilities on the fixed route service) and $2.00 per one way ride for all non-ADA certified seniors ($0.50 per one way ride for non-ADA certified seniors on the fixed route service).

The Region 8 Regional Transit Authority (RTA) was formed to improve, consolidate, and coordinate transportation services and provide accessible transportation to the cities and rural areas of the Regional Planning Area 8 which includes Delaware, Dubuque, and Jackson Counties. RTA provides many cities with daily inter and intra-city service, while other communities have service several times per week. The RTA also serves rural residents through its demand response service. The Region 8 RTA operates a fleet of 27 lift equipped light duty buses, 2 ramp accessible minivans, and 2 non-ADA standard vans. Figure 3.10 shows RTA's transit routes within Dubuque County.

Figure 3.10

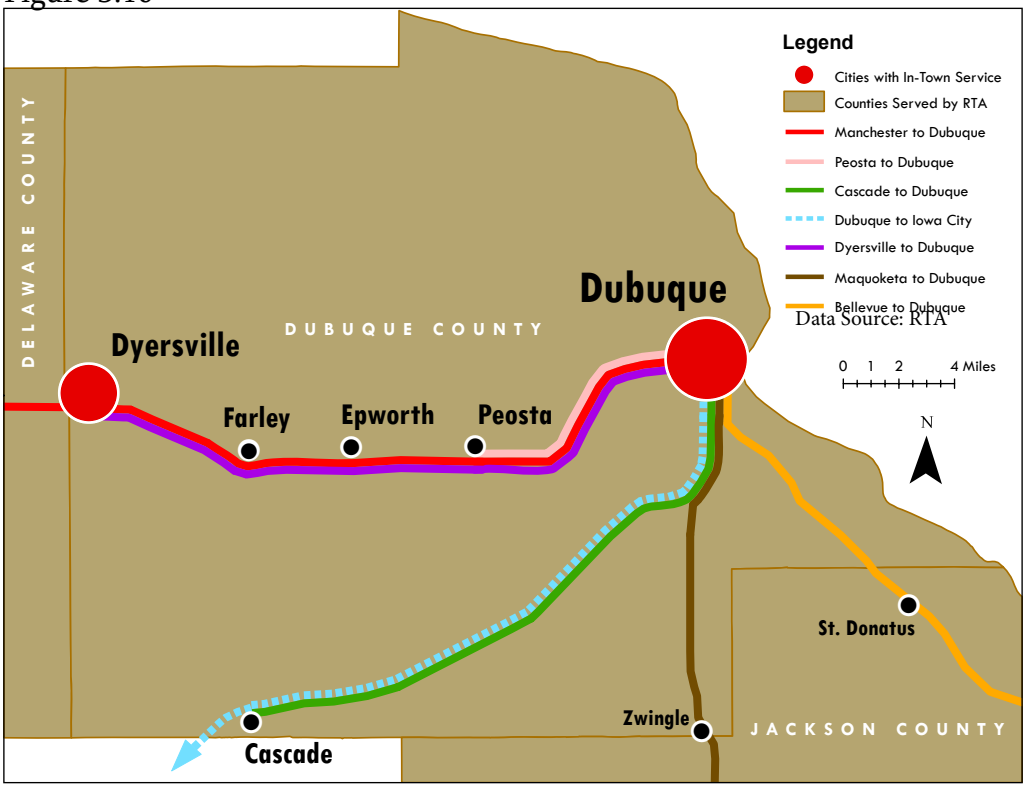
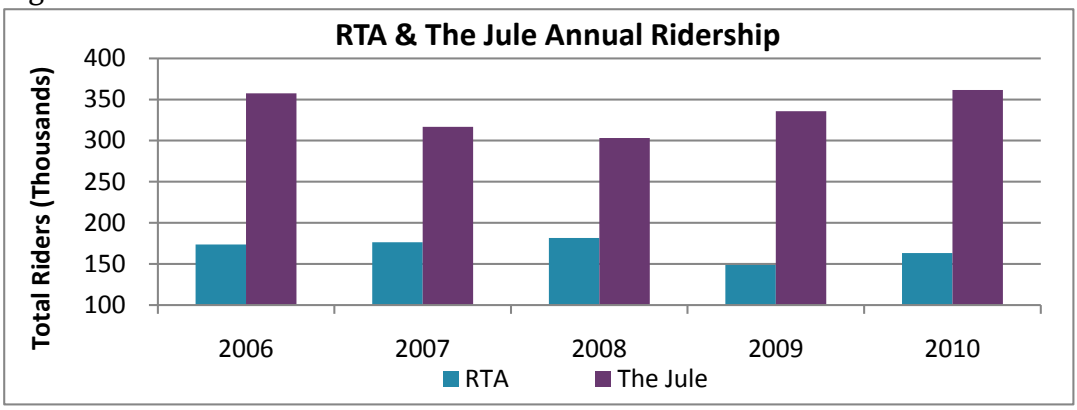


Figure 3.11 displays the annual ridership numbers for RTA and The Jule over the past five years.

Figure 3.11



DuRide is a nonprofit transportation program that is operated by volunteers. Volunteers use their own vehicles to provide at-cost rides to Dubuque, Asbury, and East Dubuque residents age 65 and older. DuRide charges a $40 annual fee and a small pick up fee of three to five dollars for each trip. DuRide uses an account system so riders do not have to pay during their ride. Consumers are encouraged to donate their vehicles they no longer use, in exchange for credit towards their ride account.

The Grant County Center on Aging provides demand response transit service to the residents of Grant County, Wisconsin. The Center on Aging is located in the lower level of the Community Services Building, 8820 Hwy 35-61 South, Lancaster, Wisconsin. The Center on Aging provides a variety of service options based on client needs. The Center on Aging operates two ADA light duty buses, and 1 ADA minivan.

TRIPS is a service provided by the Center on Aging of Grant County which is available to residents of Grant County who are transit dependent for medical or physical reasons. A volunteer staff uses their personal vehicle to transport individuals to medical and other important businesses.

Bicycle and Pedestrian

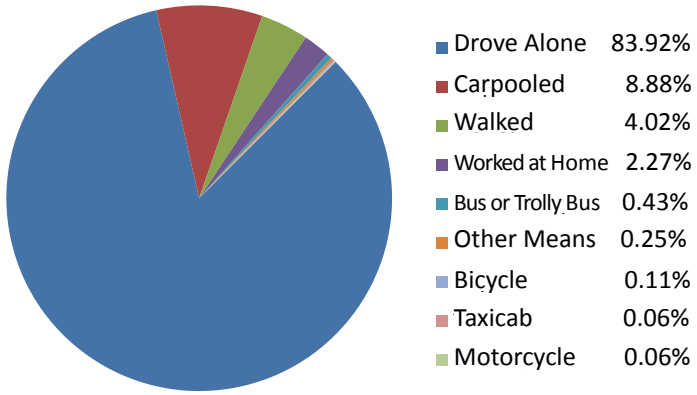
One key concept established in TEA-21 and carried forward in SAFETEA-LU was the idea of multi-modal transportation planning and safety. One of the objectives of the DMATS LRTP is to support programs that make walking and biking safer and more convenient. This element of the DMATS plan will focus on the development of the bike and pedestrian segment of the metropolitan transportation system.

Existing Bicycle and Pedestrian Transportation

Data from the 2000 US Census shows that 4.02% of DMATS residents currently walk to work daily, while only 0.11% bicycle to work.

Nationally, 2.93% walk and 0.38% of commuters bicycle to work on a daily basis. See Figure 3.12 for commute data for all modes of transportation.

Figure 3.12 **Mode to Work**



Data Source: 2000 US Census

The Heritage Trail (above) is a 26 mile trail that runs between Dubuque and Dyersville.

Bicycle Skill Levels

When creating a bicycling, hiking, and walking system, it is importation to make sure that system will accommodate as many users as possible. The system should take into consideration the differing abilities of the potential riders using the system. The Federal Highway Administration (FHWA) uses the following categories of bicycle users to assist in determining the impact that different facilities and roadway conditions will have on the bicyclist. Those categories are:

Group A Bicyclists: Advanced or Experienced Riders. This group is comfortable operating a bicycle in most traffic conditions, and generally is using their bicycle as they would a motor vehicle. They comprise the majority of bicycle users on collector and arterial streets and are best served by the following:

- Direct access to destinations usually via the existing street and highway systems.
- The opportunity to operate at maximum speed and minimum delays.
- Sufficient operating space on the roadways or shoulder to reduce the need for either the bicyclists or the motorists to change position when passing.

Group B Bicyclists: Basic or Less Confident Adult Riders Group B riders may also be using their bicycle for transportation purposes, however they prefer to avoid roads with high vehicle volumes and fast moving traffic. These bicyclists prefer:

- Comfortable access to destinations, preferably by a direct route using low-speed, low traffic volume streets or a designated bicycle facility.
- Well-defined separation of bicycles and motor vehicles on arterial and collectors streets, such as bicycle lanes, paved shoulders, or multi-use trail.

Group C Bicyclists: Children. This group can either be riding on their own or with parents/adults. This group may not travel as fast as group A and B bicyclists, however they still seek access to key destinations. This group is served best by the following:

- Access to key destinations surrounding residential areas, including schools, recreation facilities, shopping, and other residential areas.
- Residential streets with low motor vehicle volume and speed.
- Well-defined separation of bicyclists and motor vehicles on arterial and collector streets or multi-use trails.

The Bicycle Federation of America estimates that out of nearly 100 million people in the United States that own bicycles, roughly 5 percent qualify as Group A bicyclists, with the remaining 95 percent as Group B and C bicyclists.

Tri-State Area Integrated Walking, Bicycling, and Hiking Network Plan

The Tri-State Area Integrated Walking, Bicycling and Hiking Network Plan identifies existing network needs and recommends projects that will enhance and improve the conditions for walkers, bikers, and hikers within the DMATS area. The plan also provides an inventory of the current trail system. Please refer to this document for a more detailed analysis of the trails system in the DMATS area.

Bicycle and Pedestrian Facility Types

Figure 3.13

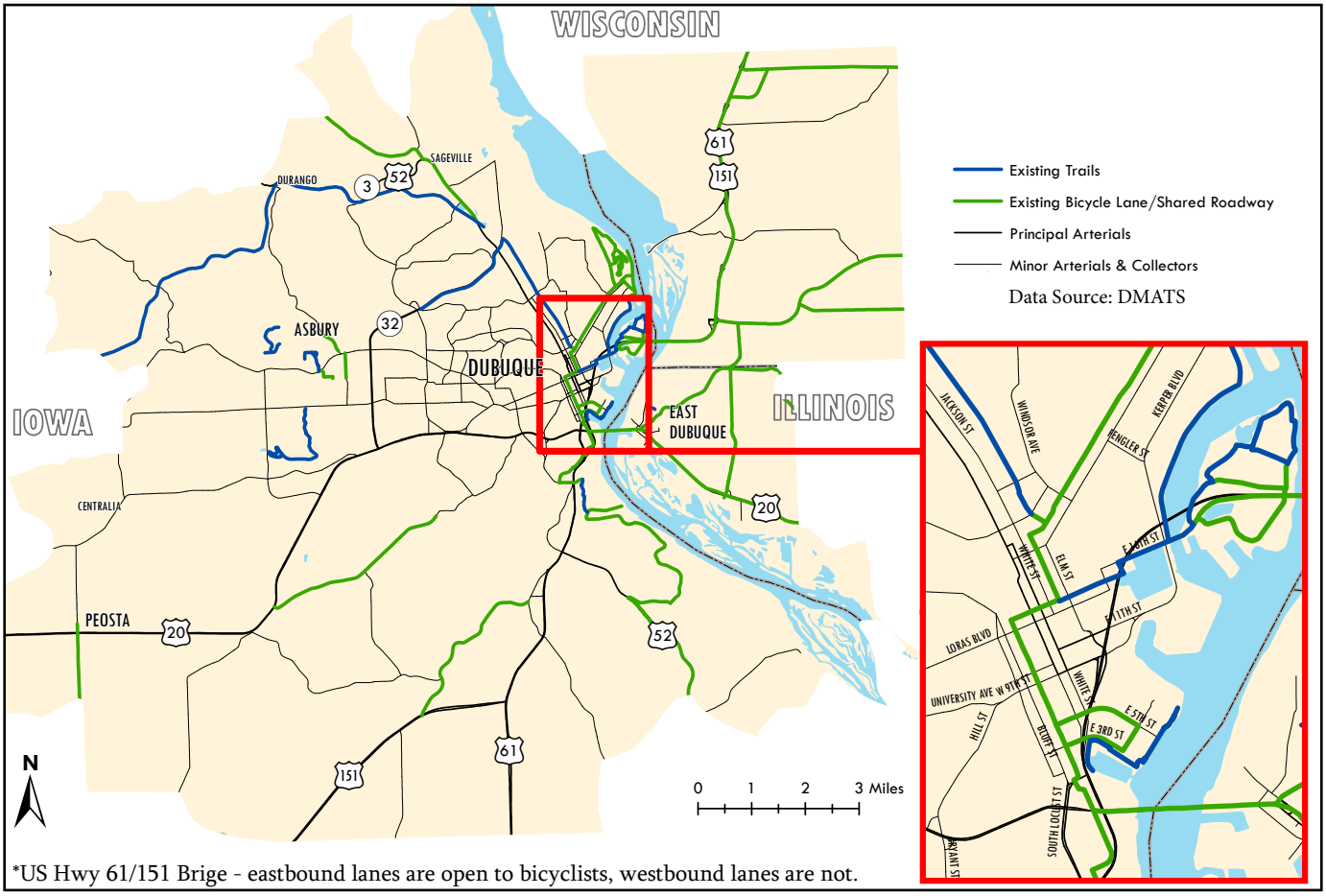


Figure 3.13 shows the existing hiking and biking facilities in the DMATS area.

Separated Facility

A separated facility is a bikeway physically separated from motorized traffic by open space or barrier and either in the highway right-of-way or in an independent right-of-way. These facilities are suitable for all groups of riders.

Bike Lane.

A bike lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential for exclusive use of bicyclists. The pavement striping helps Group B and C level riders feel more secure when riding.

Shared Roadway

A shared roadway is similar to a bike lane except no pavement markings are used. Instead, routes are indicated using signage. The signage indicates that responsible agencies have taken actions to assure that routes are suitable for cyclists. Group A bicyclists and some Group B bicyclists are able to utilize shared roadways.

Wide Outside Lanes

Roadways can be designed with the right most through traffic lanes substantially wider than normal to better accommodate cyclists. Most practitioners agree that 14 feet is the minimum width necessary to allow a bicyclist and motorist to share the same lane without coming into conflict. Group A bicyclists and some Group B bicyclists are able to utilize wide outside lanes and navigate very well in all but heavy traffic.

Freight

The efficient movement of goods is one of the keys to effective competition in the world market system. As a result, policy makers, industry specialists, and transportation planners have recognized that providing efficient systems for moving goods will help to create a competitive advantage in the global market. This section focuses on the three freight modes which are active in the DMATS area: water-borne, truck, and rail. Although each of the freight shipping options are described separately, the different modes are often used in combination, which is referred to as intermodal freight transport.

The DMATS area is located on the Mississippi river, the longest river in North America, with a length of 2,340 miles from its source in Lake Itasca in Minnesota to its mouth in the Gulf of Mexico. The river serves as a valuable asset to the DMATS region, providing direct connectivity to 10 states and numerous cities. The river is currently being used for incoming and outgoing freight. The region is also located on US Hwy 20, US Hwy 51/161, and US Hwy 52. These highways provide a ground connection to the rest of Iowa, Illinois, Wisconsin, and the nation. The rail system that passes through the region is another valuable resource as Iowa moves into greater ethanol and biodiesel production which will require rail transport. Air transport is currently not used by the DMATS region for goods movement as Cedar Rapids, IA and Rockford, IL are located within reasonable driving distance and both serve as major air freight hubs for the surrounding area.

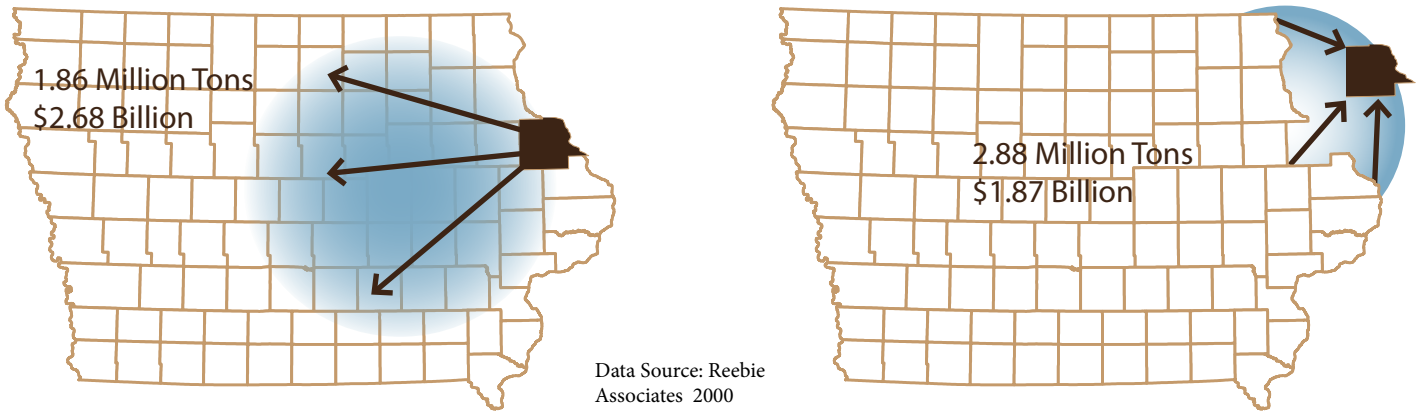
This element of the DMATS plan will focus on the current and predicted freight movement patterns as well as existing barge, and rail facilities in the region. Freight data used was compiled for the Iowa DOT by Reebie Associates in 2000. The data used is available at the county level only, and as a result the data presented is an approximation of actual freight movement in the DMATS area. Data was not available for the Wisconsin or Illinois portion of the region.

Total Freight Movement

Originating Tons: 4.53 Million
Originating Value: $4.82 Billion

Terminating Tons: 6.42 Million
Terminating Value: $6.32 Billion

Figure 3.14

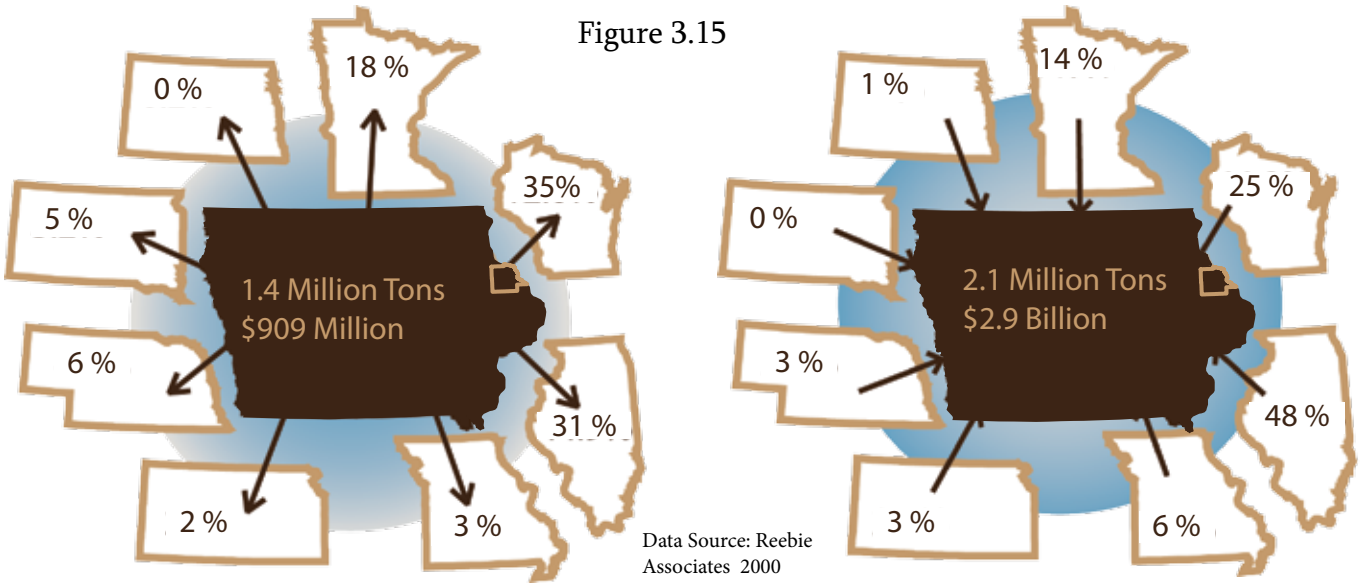


Data Source: Reebie Associates 2000

Freight moving out of Dubuque County to the State of Iowa consists mainly of products in the following categories: ordinance or accessories, food or kindred products, and chemicals or allied products. Freight originating in Dubuque County was expected to increase by 66.9% between 2001 and 2011. Freight moving into Dubuque County from in state, consists mainly of products in the following categories: food or kindred products, primary metal products, machinery, and lumber or wood products. Freight terminating Dubuque County was expected to increase by 69.5% between 2001 and 2011. (See Figure 3.13)

Freight moving out of Dubuque County and the state of Iowa consists mainly of products in the following categories: chemicals or allied products, food or kindred products, and transportation equipment. Freight originating in Dubuque County was expected to increase to all surrounding states and national regions with exception of the North Prairie region. Freight moving into the Dubuque County, not including that from in state, consists mainly of products in the following categories: chemicals or allied products, fabricated metal products and primary metal products. Freight terminating in Dubuque County was also expected to increase from all states and national regions with the exception of North Dakota. (See Figure 3.14)

Figure 3.15

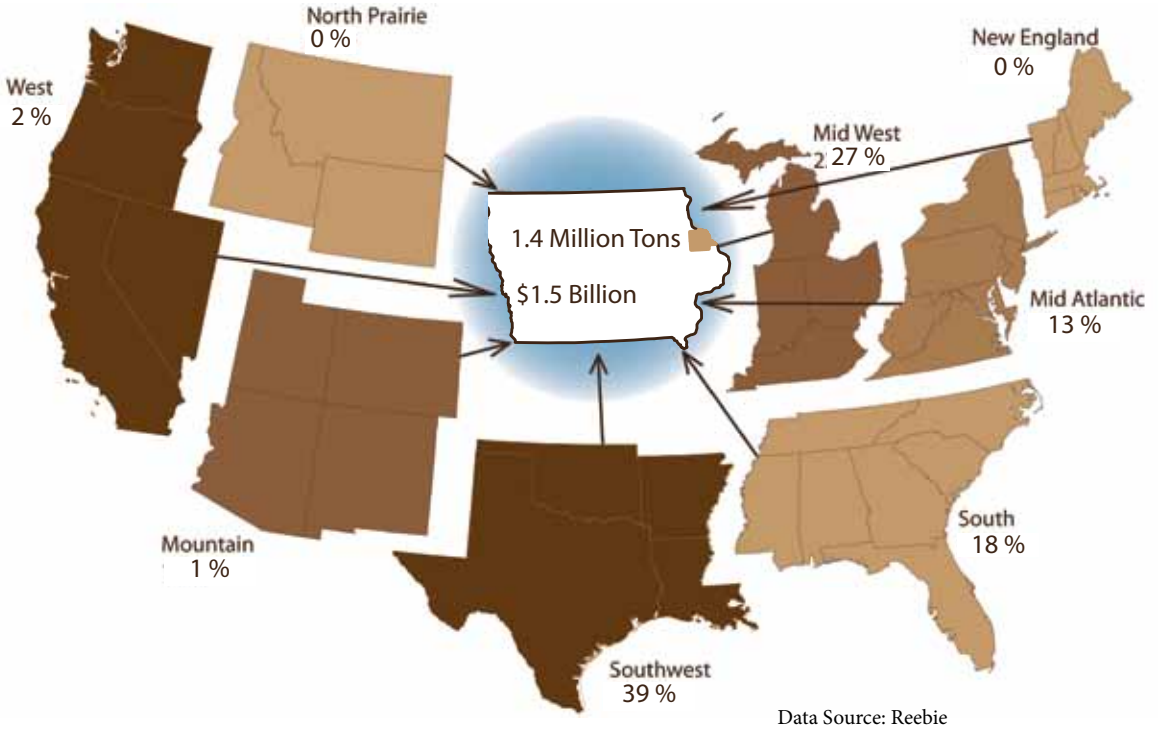


Data Source: Reebie Associates 2000

Regionally, the two largest recipients of freight from Dubuque County, via truck and rail, are Illinois and Minnesota. By water, Wisconsin is the largest recipient.

Regionally, the two largest deliverers of freight to Dubuque County, via truck, are Wisconsin and Illinois. By rail, the largest deliverers are Illinois and Wisconsin. By water, Illinois, Minnesota, and Missouri are the largest deliverers.

Figure 3.16



Data Source: Reebie Associates 2000

Nationally, the two largest deliverers of freight to Dubuque County, via truck, are the Midwest and the South. By both rail and water, the largest deliverer is the Southwest.

Nationally, the largest recipient of freight from Dubuque County, via truck, water and rail, is the Southwest. Figure

3.16 shows the percentage of freight moving between Dubuque County and all regions of Dubuque County other than the Midwest.

Rail Facilities

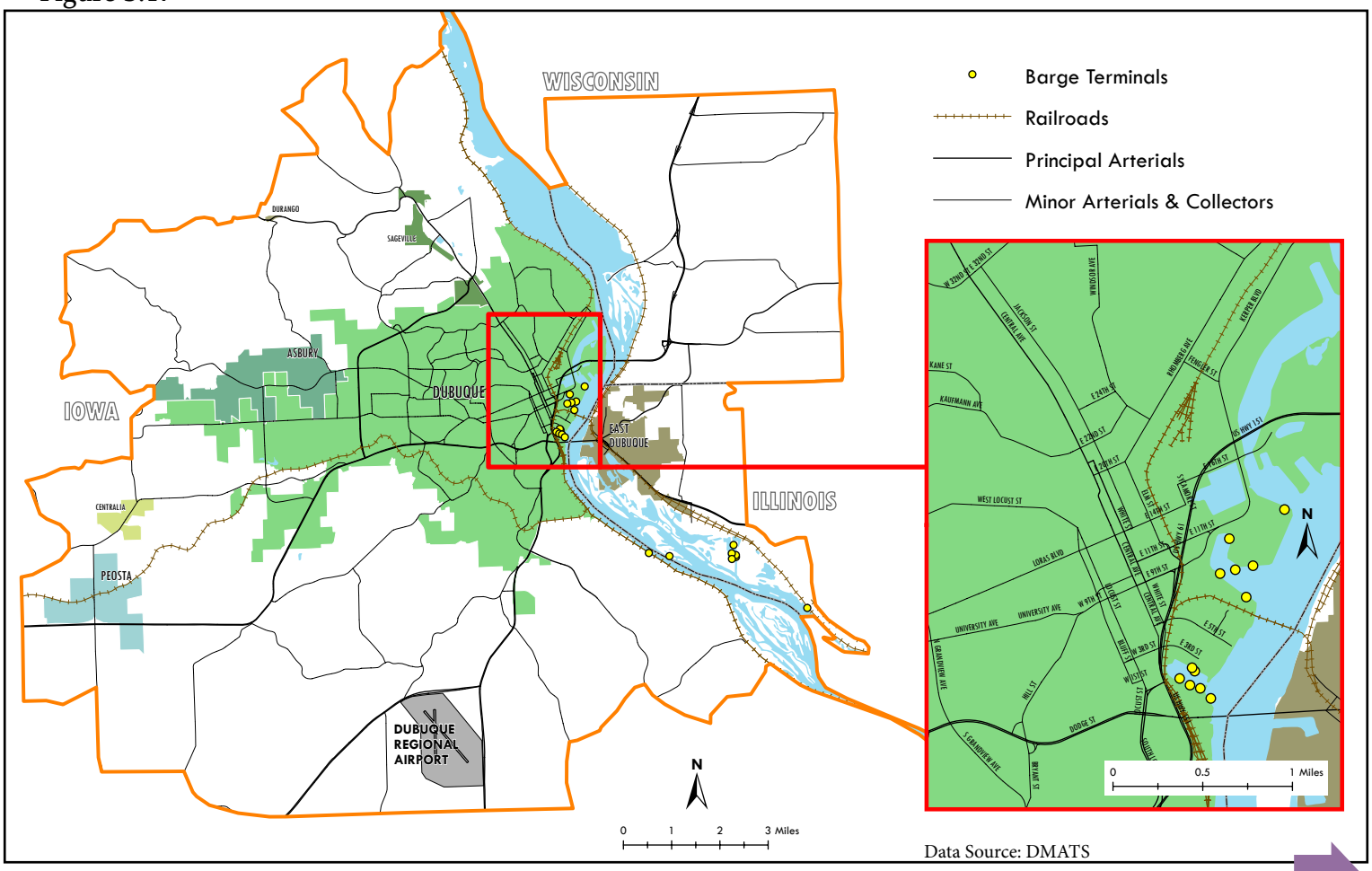
The DMATS area is served by 3 rail carriers. The following describes the carriers in general terms. Figure 3.17 shows the location of the primary freight facilities in the DMATS area.

The Burlington Northern and Santa Fe Railway (BNSF) is among the largest railroads in the United States today with track mileage totaling 33,353 miles covering 28 states and two Canadian provinces. In the DMATS area, the BNSF's track is located exclusively on the east side of the Mississippi in the governmental jurisdictions of Grant County, Wisconsin, Jo Daviess County, and the City of East Dubuque in Illinois.

Canadian Pacific On October 30, 2008 the Canadian pacific officially acquired Iowa, Chicago, and Eastern Railroad and the Dakota, Minnesota and Eastern Railroad. Between the two branches (DM&E and IC&E) the railroad operates in Iowa, Illinois, Minnesota, Missouri, Nebraska, Wyoming, Wisconsin and South Dakota. Canadian Pacific provides service between Minneapolis, Chicago and Kansas City. The main route in Iowa parallels the Mississippi River on the west side from the Minnesota state line, south through the Dubuque area as far as Muscatine. Canadian Pacific also operates an east-west line that begins in Marquette and extends west through northern Iowa to Sheldon.

Canadian National (CN) Following its acquisition of Illinois Central in 1999, WC in 2001, and GLT in 2004, as well as its partnership agreement with BC Rail in 2004, . CN is the only railroad which crosses the continent east-west and north-south, serving ports on the Atlantic, Pacific, and Gulf coasts while linking customers to all three NAFTA nations.

Figure 3.17



Data Source: DMATS

Barge Facilities

The following river freight facilities are currently operating in the Dubuque water front area:

The Dubuque River Terminal is located on 12th Street in the City of Dubuque. The terminal has capacity to unload or store two barges. The terminal has rail access to the Illinois Central and the Burlington Northern Santa Fe railroads. Rail car storage capacity is 12 cars and this terminal facility has liquid storage capacity of 3,384,000 gallons, outside bulk storage of 5 acres and a 20,000 square foot storage building. Major commodities handled at this terminal include steel, twine, salt and lignon liquor.

The Koch Materials Co. Terminal is located at 1550 12th Street in the City of Dubuque. The main material handled at the terminal is asphalt cement. This site has the capacity to work 2 barges simultaneously. There is a railroad siding adjacent to the site allowing transfer of bulk materials to railcars for shipment on any of the railroad providers in the Dubuque area. The terminal has a liquid material transfer capability of 4,000 barrels per hour as well as liquid bulk-material storage facilities on site.

The AGRI Grain Marketing Terminal is primarily an intermodal shipping point for agricultural materials and products. Materials handled include corn, soybeans, fertilizer, and salt. The terminal is located at 1050 Kerper Blvd in Dubuque, Iowa. The terminal has the capability of working on two barges as well as storing one barge. The terminal also has railroad access and rail storage capacity of 40 cars. The terminal has transfer capabilities of 200 tons per hour and dry storage facilities for 60,000 bushels of grain and 35,000 tons of fertilizer.

The Peavey Co. Terminal is primarily used for the storage and transfer of bulk dry materials including corn, soybeans, waxy corn, high oil corn, fertilizer, coal, and salt. The terminal has rail access and storage for up to 45 rail cars. The terminal can work 2 barges simultaneously and has dry material storage capability for 320,000 bushels upright and 1.7 million bushels outside.

The Dubuque Power Plant Terminal is used exclusively for the coal fueled power plant. This facility is located at 920 Kerper Boulevard in Dubuque, Iowa. The facility does not have rail access or rail storage capability. One barge can be worked at a time and two barges can be stored. Equipment at the terminal can unload one barge in approximately 5 hours, and dry storage facilities exist on site for 130,000 tons.

The Jones Street Dubuque River Terminal is operated in conjunction with the 12th Street Dubuque River Terminal. The facility has rail access and storage capacity for 12 cars. The major commodities handled at this location include steel, twine, salt and lignon liquor. The site can work and store two barges.

IEI Barge Services Inc. is part of the Alliant Energy and is located at 18525 Highway 20 West in East Dubuque, Illinois or mile 574.5 on the Mississippi River. IEI Barge Services offers unloading, storing, and loading of dry bulk commodities to and from barge, rail and truck.

Dubuque Barge & Fleeting Service/Newt Marine is one of two barge fleeting services in the DMATS water front area. This site has a capability of storing up to 100 barges. Services offered include six towboats, mechanical dredging, salvage, lock and bridge assistance, barge rental or repair, and cargo transfer.

ARTCO Fleeting Service provides full harbor service including barge switching, cleaning, fleeting, repairs, material transfers, towing, and lock and bridge assistance. ARTCO is currently fleeting from the east end of the 4th Street Peninsula in the Dubuque harbor. Their fleeting site accommodates approximately 80 barges.

Air Transportation

The Dubuque Regional Airport Master Plan was last updated in 2004 by Coffman Associates, Incorporated of Lee's Summit, Missouri. The plan is designed to provide systematic guidelines to the City of Dubuque in its overall development of the airport. The Airport Element of the 2040 Long-Range Transportation Plan will summarize and incorporate the recommendations of the 2004 Airport Master Plan update.

Based aircraft at the airport totaled 79 aircraft in 2003. There were an estimated 55,009 total annual operations conducted in 2003. Of that total, general aviation had 48,447 operations, commercial carriers had 6,489 operations, and the military had 73 operations. In recent years the number of aircraft operations and revenue enplaments has decreased. (See Figures 3.17 and 3.18). Commercial flights out of the Dubuque Regional Airport are provided by American Eagle Airlines. American Eagle currently offers three daily flights to Chicago O'Hare International Airport.

Figure 3.19

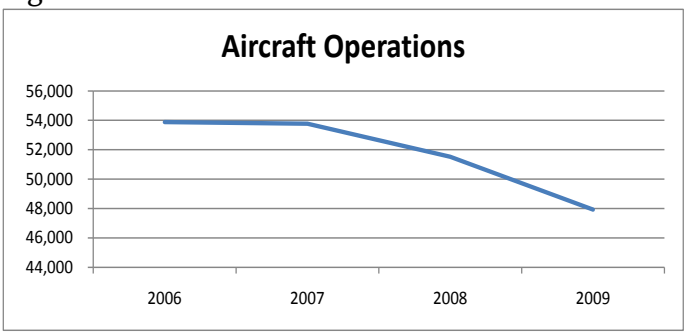
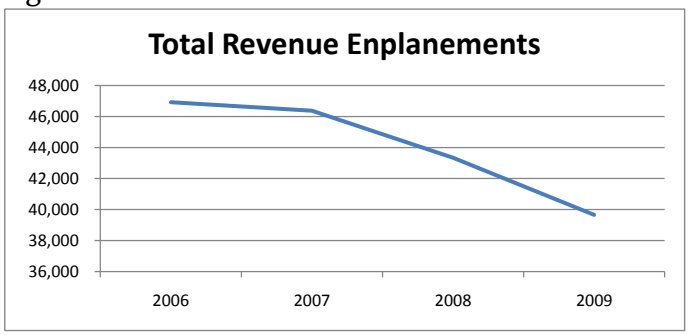


Figure 3.18



Data Source: Dubuque Regional Airport

Existing Facilities

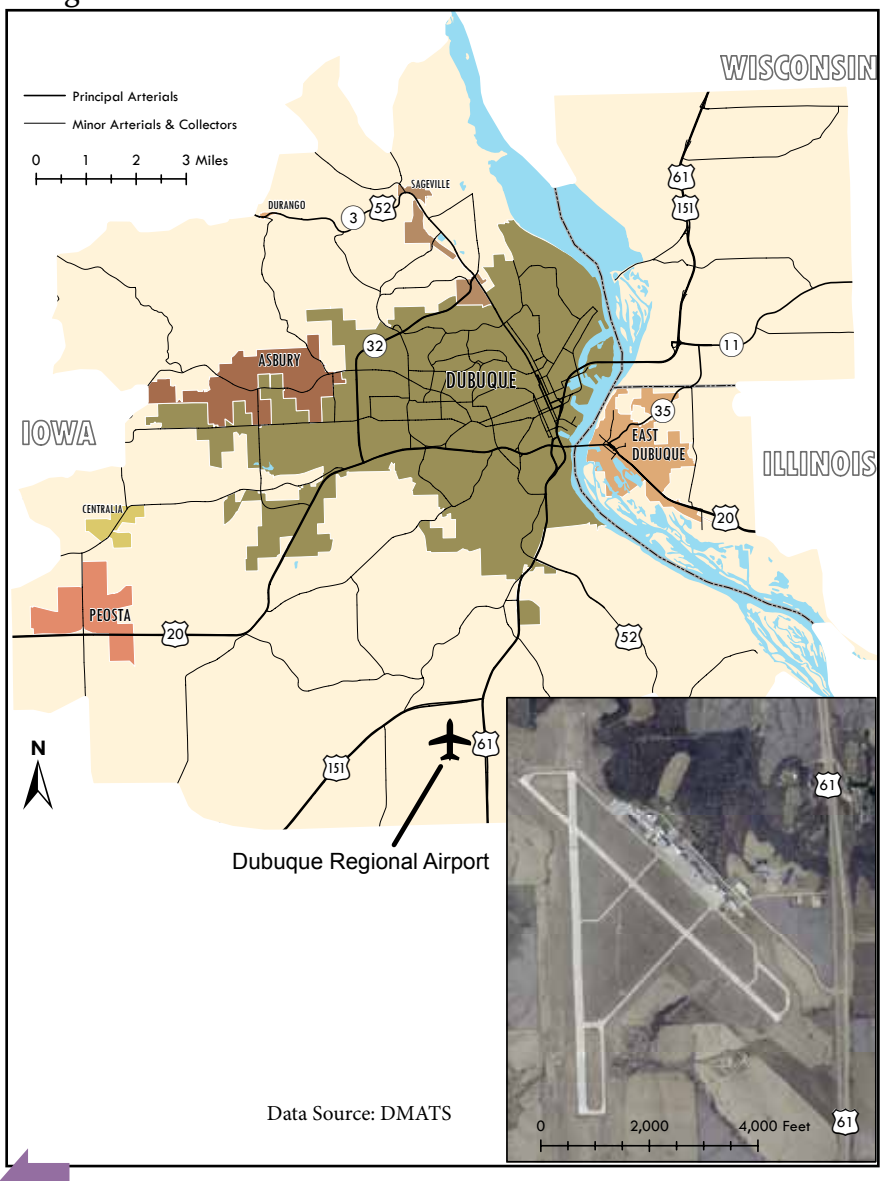
The Dubuque Regional Airport is located about seven miles south of downtown Dubuque on US 61. (See Figure 3.20. Primary access to the airport is off of US 61. The airport location is shown on the map below. The airport occupies 1,057 acres and has a field elevation of 1,076 feet. The airport opened at the present location in 1948.

Airside Facilities

The airport has two runways and five taxiways to support air operations. Runway 18-36 is a north-south oriented runway that serves as the airport's primary runway. The runway is 6,325 feet long and 150 feet wide. The pavement is rated at 75,000 pounds for a single wheel gear aircraft, 173,000 pounds for duel wheel gear aircraft and 215,000 pounds for a duel tandem aircraft. The runway is served by a full instrument landing system.

Runway 13-31 is a northwest-southeast oriented runway and serves as the airport's secondary runway. The runway is 6,498 feet long and 100 feet wide. The pavement is rated to 75,000 pounds for a single wheel gear aircraft, 125,000 pounds for a duel wheel gear aircraft and 215,000 pounds for duel tandem aircraft. A localizer, MALSR and MALS, serves the runway.

Figure 3.20



Taxiways provide adequate access to both of the runways and consist of parallel, connecting, access and entrance/exit taxiways. Taxiway A runs parallel to Runway 13-31. Taxiways B, C, D and E provide access between the two runways and the terminal/hanger area.

Groundside Facilities

The Dubuque Regional Airport's groundside facilities serve passengers, freight, airport administration, and general aviation needs. The current terminal building is 11,656 square feet in extent. The original terminal was built in 1948. A new terminal was constructed next to the existing one in 1969. In a remodeling project in 1989 the two buildings were combined. The airport also includes six T-hangers and six conventional/executive hangar buildings. The airport has 440 parking spaces in five parking lots that are available for use by airport patrons, employees, and other airport users.

Special Initiatives

Local governments are currently partnering with private businesses, non-profit organizations, and individuals to implement several special initiatives within the region. This section will present three of these initiatives: Safe Routes to School, Sustainability, and ITS improvements. These initiatives are aimed at improving the quality of life in the DMATS region by making the region more sustianable, improving the transportation system, and improving safety and security.

Safe Routes to School

The goal of the Safe Routes to School program is to enable community leaders, schools and parents across the United States to improve safety and encourage more children to walk and bicycle to school safely. The Dubuque Safe Routes to School Plan seeks to achieve this goal through two objectives. The first objective is to involve a variety of local entities in the planning process. Involving city, county, and school officials in the planning process will ensure that parents, local governments, and the schools are communicating and working together on walking and biking projects. The second objective of the plan is to provide a list of projects for each school that, when implemented, will provide students with safer opportunities to walk and bike to school and encourage students to take advantage of these opportunities. The project list can be used to guide future investments in walking and biking.

The Dubuque Safe Routes to School planning process began in the spring of 2008. In early May DMATS staff invited officials from the City of Dubuque, City of Asbury, Dubuque County, Dubuque Community School District, and Holy Family Catholic to be a part of the Dubuque SRTS steering committee. The steering committee was responsible for setting the goals and objectives for the planning process, and choosing and prioritizing the projects that would be included in the final plan. The goal of the SRTS planning process was to identify the problems that were preventing students from walking and biking to school safely. Then, based on the list of problems, the steering committee would develop a list of infrastructure and non-infrastructure projects that would address each problem.

Initial efforts in the SRTS planning process were focused on collecting data using surveys. In September of 2009 staff distributed questionnaires to middle and high school students, and the parents of elementary school students. The surveys served as a means to determine how students were currently getting to school, and which routes they were taking to get there. Once the survey results were compiled, staff met with school administrators and neighborhood associations to develop an initial list of projects. The steering committee prioritized the initial list of projects during a series of public workshop meetings, which were held between February and April of 2009. Following its completion, the project list was presented to City engineering staff for final review.

Following success of the SRTS planning process within the City of Dubuque, DMATS received grant funding to implement the SRTS planning process in the Western Dubuque School District. Planning funds were awarded in January of 2009, and the planning process is currently underway.

Safe Routes to School Projects

Project lists were developed for each school after holding public meetings and input sessions with The Dubuque Community School District, Holy Family Catholic Schools, The City of Dubuque, Dubuque County, The City of Asbury, and several neighborhood associations. Projects identified in the summary reports were grouped by project type. Table 3.4 shows the number of projects in each group by school, and the total number of projects in each group. Projects 19-28 were specific to one school.

Table 3.4

Project No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Project Type	High Visibility Painted Crosswalks	Flashing School Crossing Lights	Fully Signalized Intersection	Adult Crossing Guards	No Parking Areas	Curb Extensions	Build Sidewalks	Bike Lane or Sharrows	Stop Signs	Fully Signalized Crosswalks	Pedestrian Overpass	Pedestrian Countdown Signals	Roundabout	Additional Street Lighting	School Crossing Sign	Portable Stop Sign	Traffic Calming Devices	Additional Bike Racks	Children Playing Signs	Student Crossing Guards	Install Fence	Surveillance Camera	Restrict Right Turn on Red	Close Street to Through Traffic	Shrub Removal	Tighten Turning Radius	Widen Pedestrian/Cyclist Area	Extend Grant Park to 16th Street
Audubon	7	4	3	1	1	2														1								
Marshall		1			2	2	1	3		1																		
Jefferson	3	1	1		2				1					1	1													
Fulton	4	1				4				1																		
Sageville	1	1		1			1								1													
Eisenhower	1	2					2					1				1												
Mazzuchelli/Wahlert	3	3				1	1	1	1								1											
Resurrection	1																											
Carver	1	4	4	5			2				1							1										
Roosevelt	2	2	2			1	1				2										1	1						
Hempstead	1								1																			
Hoover		2		2					1		1																	
Kennedy	4	2		1					2																			
Irving		1			1					1		1											1					
St. Anthony/OLG		1									1		1				1							1				
Senior	1												1															
Table Mound	2	2	2				1																					
Bryant	5	5		2	1																				1	1		
St. Columbkille	1			1	2																							
Washington	1	1	1					1				2	1														1	
Lincoln	1	2	2	2	2	2			1							1												
Central	4		2																									
Prescott	6	1	3		1			3						1				1	2									1
Holy Ghost		1								2																		
TOTAL	49	37	20	15	12	12	9	8	7	5	5	4	3	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1
																			Projects Unique to One Specific School									

Sustainability

DMATS has undertaken an initiative to align the transportation system with the principals of sustainability. A sustainable transportation system is one that provides transportation in a way that promotes Environmental/Ecological Integrity, Economic Prosperity, and Social/Cultural Vibrancy.

Environmental/Ecological Integrity DMATS is working to improve air and water quality in the area by supporting reductions in mobile source emissions, investing in high efficiency transit vehicles, promoting the use of transit and carpooling, and minimizing the impact of transportation projects on environmentally sensitive areas.

Economic Prosperity Transportation plays a vital role in the economy of the DMATS area. DMATS will encourage future economic sustainability by investing in transportation projects that will encourage new investments in the local economy. DMATS will ensure that funding will be available in the future by balancing project needs and priorities with financial constraints.

Social/Cultural Vibrancy DMATS will work to promote social and cultural vibrancy by making transportation available to as many area residents as possible. DMATS will also work to minimize negative environmental impacts of transportation on low income and minority populations.

DMATS has supported several community projects that promote sustainability in the area. The Petal Project and Dubuque 2.0 are two ongoing projects that are working to make the DMATS area Viable, Livable, and Equitable.

Petal Project The Petal Project is a green business certification that is designed to help Eastern Iowa businesses adopt policies and practices that positively impact the environment and the company's bottom line. The Petal Project provides businesses a clear sustainability framework and technical assistance from a Petal Project representative while creating a universally understood definition of a green business for consumers wishing to shop based on their values.

Dubuque 2.0 Dubuque 2.0 is a venue where sustainable ideas are presented, best practices are shared, and results from the community's efforts are measured. Much like Envision 2010, Dubuque 2.0 is a process that encourages public/private partnerships to shape our community's future.

The primary objective of Dubuque 2.0 is to build on the city's existing sustainability plan by combining the strengths of our community with new opportunities to make our community economically prosperous, socially and culturally vibrant, and improving our environmental integrity. Dubuque 2.0 uses many tools to engage businesses, schools, non-profits, and neighborhoods in a comprehensive sustainability process

Iowa Smart Planning Grant Dubuque County has received $89,000 through the Iowa Smart Planning: Local Comprehensive Planning Grant Program. The funds will be used to update the comprehensive plans of Dubuque County, the City of Dubuque, and six other cities within the county. The goal of the plan updates is to incorporate the Smart Planning Principles adopted by the State of Iowa. Smart Planning is meant to improve community resiliency following the storms of 2008 in ways that increase economic opportunity, protect environmental resources, and improve quality of life. Grant funds will also be used to create a plan for establishing a county watershed planning authority that will focus on implementing water conservation practices.

Intelligent Transportation Systems (ITS)

The City of Dubuque is and has been committed to continuing to improve traffic flow within the City as well as incorporating appropriate ITS type assets where necessary. Given this, the City of Dubuque has begun construction of a fiber optic backbone along the Iowa Highway 32 (Northwest Arterial) and through other parts of the downtown area. A long term signal communications loop would minimize the impact of losing signal communications.

The City of Dubuque has undertaken an aggressive program to install fiber optic conduit and advanced ITS components into all new or reconstructed traffic signal controllers throughout the City of Dubuque. The need for monitoring traffic and adapting signal plans to changing conditions has led the City to install four-inch multi-ducted conduit under all new roadways to accommodate future fiber optic communications cable.

The City of Dubuque has invested in a robust Traffic Operations System that uses advanced communication technologies along with state of the art traffic control equipment that allows management of the operations via a Traffic Operations Center (TOC) located at City Hall.

Investments in maintaining traffic flow along major corridors have occurred. The City of Dubuque has developed new traffic signal standards that include: emergency generator connection ports and battery back-up systems and network gear and monitoring equipment that ties signals back to the IP-based traffic operations center. Table 3.5 contains a list of ITS projects that have been funded by grants, and future ITS projects that are listed in the City's 5-year CIP.

Table 3.5

ICAAP/TSF Grants Awarded to the City of Dubuque for years 2005-2009

Description	Total Project Cost
Devon to Menards	$183,678
Traffic Control System/ Locust Connector	$421,611
IA 32 (NW Arterial) Capacity Improvements	$610,108
IA 32 (NW Arterial) Capacity Improvements	$1,190,000
US 151/61 Capacity Improvements	$871,500
Pennsylvania Ave Safety Improvements	$525,000
Data Source: City of Dubuque	$3,792,897

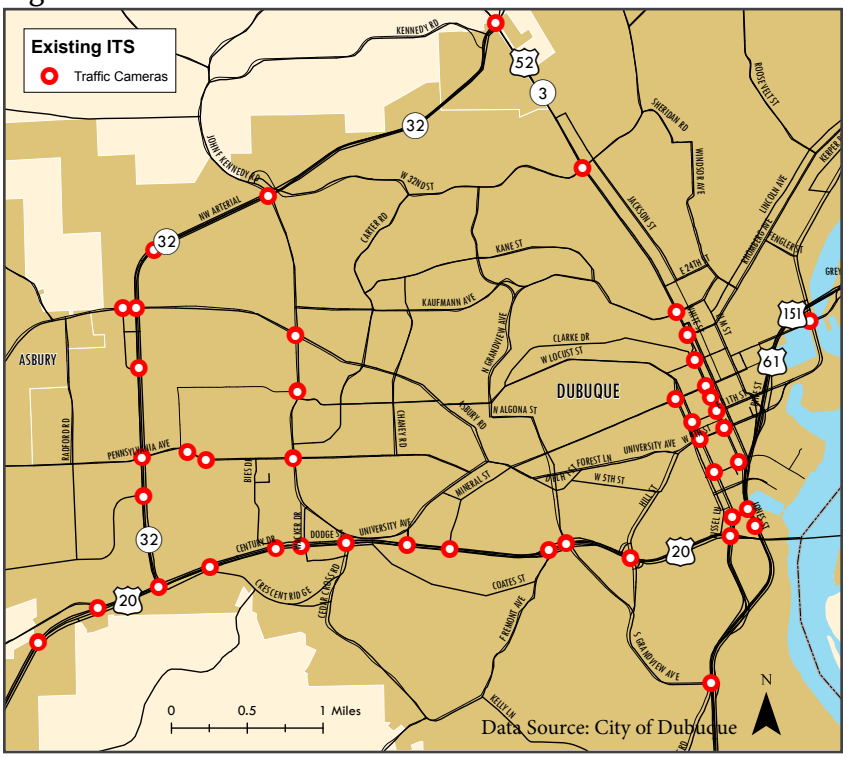
Other ITS Related Projects in last 5 years funded by the City of Dubuque

Description	Investment
Fiber Optic Conduit Installation	$1,875,000
Purchase of ACTRA City Wide Traffic Software	$150,000
Fiber Optic Network and Equipment	$275,000
PTZ Cameras and Sensors	$125,000
Video Detection installations	$250,000
Traffic Signal Intersections Upgrade	$2,125,000
Battery Backup Installation Program	$140,000
LED Signal Upgrades	$275,000
Pre-Emption Upgrades and Software	$175,000
Traffic Operations Center	$225,000
Data Source: City of Dubuque	**$5,615,000**

ITS Plan Priorities

Priority 1: U.S. 20 From Cousins Road To Julien Dubuque Bridge
Priority 2: U.S. 61/151 From South Grandview Avenue To North of Jones Street
Priority 3: U.S. 52 From 4th Street To 32nd Street
Priority 4: U.S. 61 and U.S. 151 Interchange
Priority 5: IA 32 and U.S. 52 From John F. Kennedy Road To 32nd Street
Priority 6: U.S. 52 From 4th Street To 32nd Street
Priority 7: U.S. 61/151 Wisconsin Bridge
Priority 8: U.S. 20 Julien Dubuque Bridge
Priority 9: Southwest Arterial

Figure 3.21

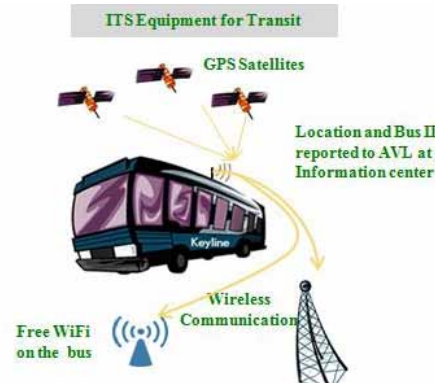


Current Intelligent Transportation Systems (ITS) Map

Figure 3.21 displays the location of all traffic operations cameras currently being operated by the City of Dubuque.

Transit Intelligent Transportation Systems

In 2010 the city of Dubuque partnered with IBM to obtain a State of Good Repair Grant through the Federal Transit administration. The primary elements of this project included new buses for The Jule, RTA, and the Dubuque School District, as well as new ITS equipment for The Jule. The Jule and its local partners will use $4 million in federal and $1 million in local dollars to complete the project. Dubuque is now in the process of implementing this project.



The Jule will use satellite technology and advanced computer modeling to track vehicles on their routes. Each vehicle will be fitted with a GPS tracking system. The Jule has GPS capabilities, but has not purchased or implemented the use of mobile data terminals.

Through the project, mobile data terminals will be purchased for the entire The Jule fleet. Twenty-two display boards will be purchased for the transit stops. Software will be purchased to enable the system to interface with wireless devices used by riders and the existing GPS system. The GPS system will account for the locations of the vehicles, stops, and traffic patterns to accurately estimate vehicle arrival times. Estimated arrival times will be updated continuously, and will be available through the internet, system display boards, signs at businesses, and smart phones. With these ITS improvements, customers will have access to the most current information available. ITS realtime displays will be placed at bus transfer sites, parking ramps, hospitals, colleges, and business parks.

The addition of the ITS system will enhance The Jule services by reducing route headways and wait times. The new technology combined with reduced wait times will help make the transit system more efficient, convenient, andattractive to potential riders.

As part of its Smarter City initiative IBM will be using the new ITS technology to do a comprehensive analysis of vehicle miles traveled in the city. The goal of this analysis is to better understand how energy is used in Dubuque.

Conclusion

Chapter 3 presented a profile of current transportation system in the DMATS area. Data presented in this chapter underscores some of the issues currently impacting the transportation system: congestion, safety, accessibility, and pollution. The recommendations listed below outline some policies and projects that can be implemented in the next five to ten years and will help address these issues. The recommendations are based on input from staff, public input from the previous long range plan, and information collected for current projects. New recommendations will be added to the list as input is gathered throughout the planning process.

Recommendations

Roadways

- Complete the two lane SW Arterial project.
- Implement the short-range recommendations from the East West Corridor Study.

Transit

- Construct the Dubuque Intermodal Transportation Center.
- Install new technologies throughout the transit system.
- Improve energy efficiency of the fleet.
- Expand routes and service hours.

Bicycle and Pedestrian

- Encourage local governments to adopt complete streets design standards, and incorporate complete streets design into new roadway projects.
- Continue to expand the bike and pedestrian trail network.
- Implement safe routes to school infrastructure, education, enforcement, and encouragement projects.
- Create a walking and biking education and encouragement program that targets children and adults.

Airport

- Dubuque Regional Airport Terminal Project.

Passenger Rail

- Continue the development of the AMTRAK route from Dubuque to Chicago.

Freight

- Coordinate needed improvements to meet the advancements of the DMATS freight hubs.
- Continue safety improvements on primary freight corridors.

Intelligent Transportation Systems

- Work with IA DOT to install traffic information display boards.
- Complete the fiber optic back-up loop on NW Arterial.
- Install ITS improvements on the Locust Street Connector.
- Install security cameras at strategic intersections to help coordinate signals and aid law enforcement.

Policy

- Coordinate with local governments to reduce urban sprawl through smart planning.

Public input

- Create 3D visualizations for all major transportation corridors in the area.
- Allow for more web-based input on transportation projects.
- Create an education program for transportation safety and security.

Introduction

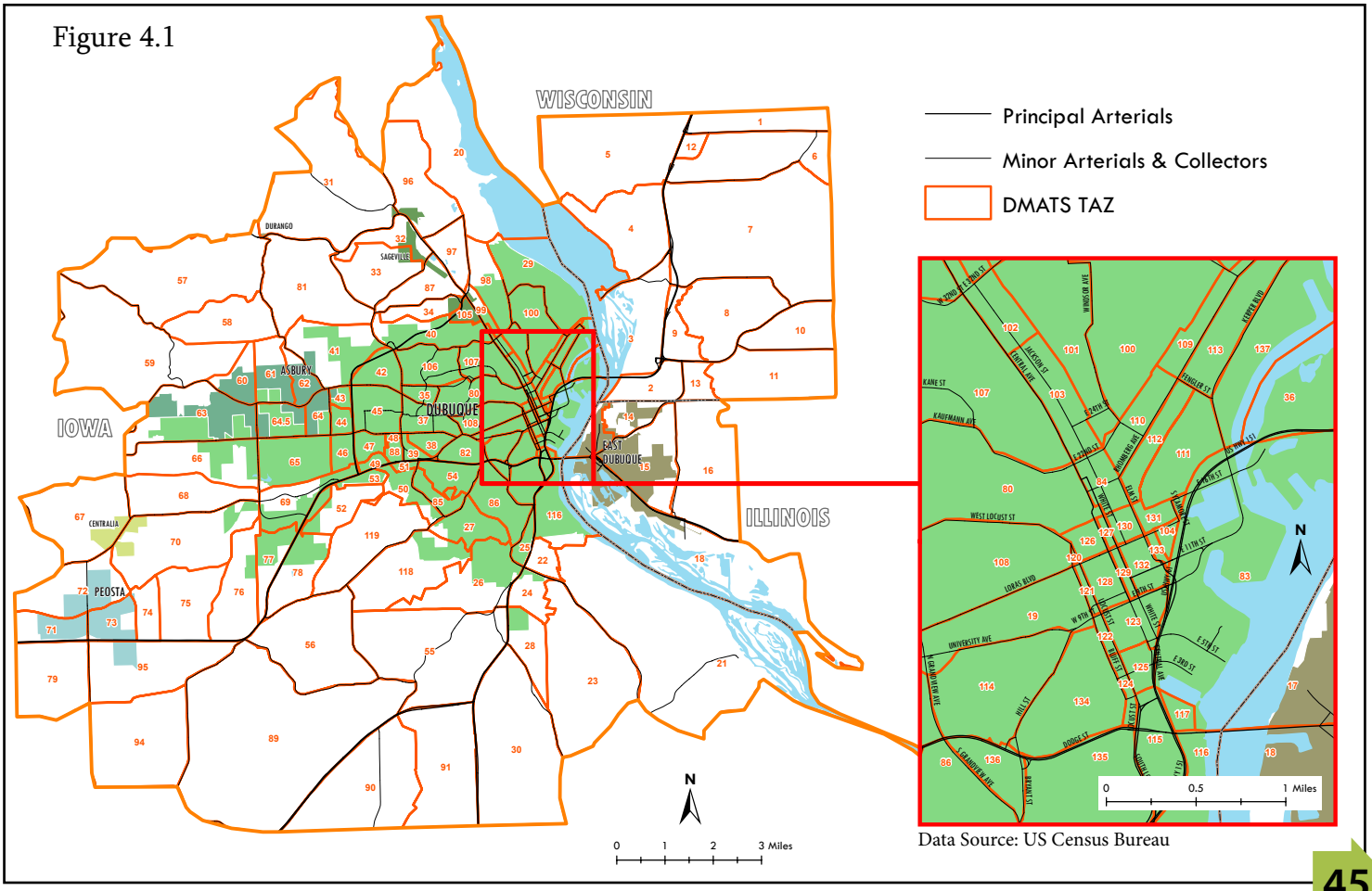
The previous chapter provides an inventory of the transportation network within the DMATS area as it exists presently. However, the long range transportation plan is also concerned with the transportation needs for the next thirty years. The objective of Chapter 4 is to provide a forecast of the transportation network to help evaluate future infrastructure investments. DMATS uses several methods for forecasting future transportation demand. For roads, DMATS uses a travel demand forecast model. For transit, bike and pedestrian, freight, and air transportation, a combination of public surveys and secondary data analysis are used to identify areas where transportation investment is needed. This chapter will provide a summary of the analysis methods, results from the analysis, and recommendations for the future based on the results.

The DMATS Travel Demand Forecast Model

A travel demand forecast model is a series of mathematical equations that represent how people make travel decisions. Thousands of travel decisions made by individuals add up to create regional travel demand. Many factors including auto ownership rate, income, household size, density, type of development, availability of public transportation, and the quality of the transportation system affect individual travel decisions. The model is based on several assumptions and its accuracy is limited by the data available.

The level of analysis for the model is the traffic analysis zone (TAZ). TAZs are a series of small areas delineated by the US Census Bureau for the purpose of traffic analysis. Zones are characterized by their population and employment. There are 153 TAZs in the DMATS area (See Figure 4.1).

Figure 4.1



Data Source: US Census Bureau

Travel Demand Modeling Process

Travel demand forecasting involves four steps: trip generation, trip distribution, mode choice, and trip assignment.

Trip Generation estimates the number of trip productions (starting points) and trip attractions (ending points) for each traffic analysis zone. The result is the total number of vehicle trips to and from activities in the study area. Information from land use, population, and economic forecasts is used to estimate how many trips will be made to and from the 153 TAZs. Methods for producing these forecasts are documented in Chapter 2.

Trip Distribution links trip productions to trip attractions for each pair of TAZs. The most commonly used method for trip distribution is the gravity model. Gravity model distributes trips produced by one zone to other zones based on trip attractions and the size of the zone.

In Mode Choice, the number of trips among all TAZ pairs are split between all possible modes of transportation. This step is omitted in the DMATS model because personal vehicle trips make up more than 95% of trips in the area.

Model Development Figure 4.2

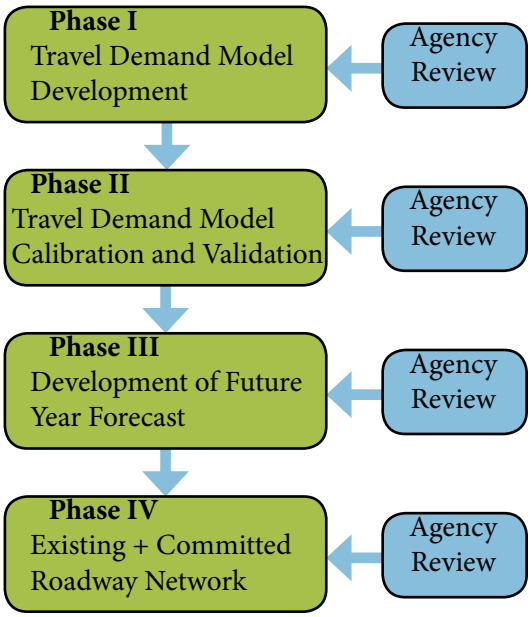
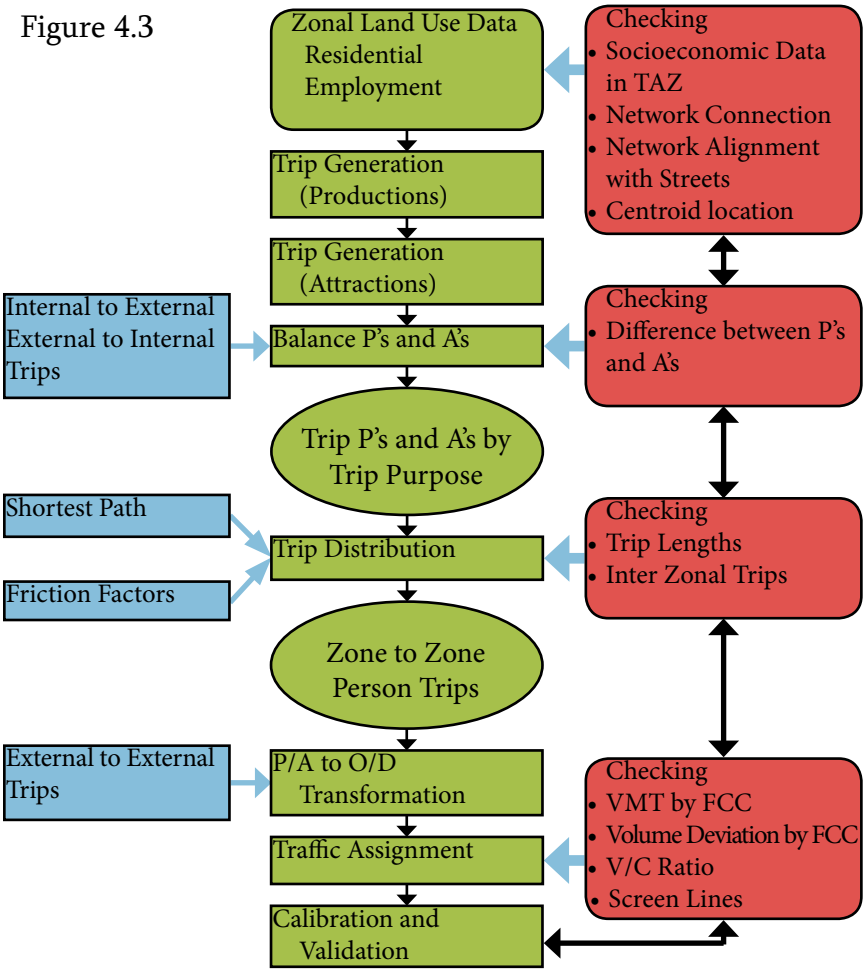


Figure 4.3



Trip Assignment Trips are assigned to specific travel paths on a computerized model of the area's roadway network. All primary roads in the region are categorized based on their capacity, speed of travel, number of lanes, presence of turn lanes, and surrounding land uses. This road network is then used by the model to simulate trips between the production and attraction pairs of traffic analysis zones. The model chooses routes based on the shortest total travel time.

The Figures 4.2 and 4.3 illustrate the DMATS modeling process.

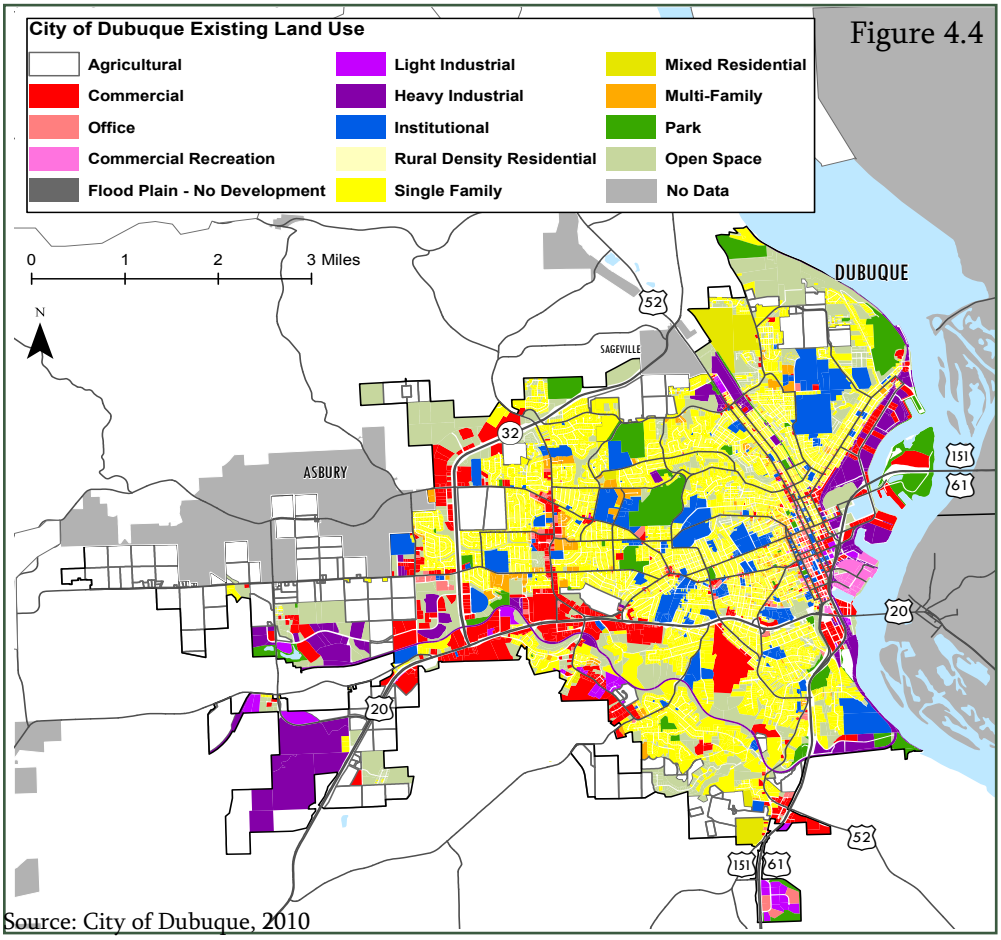


Figure 4.4

Source: City of Dubuque, 2010

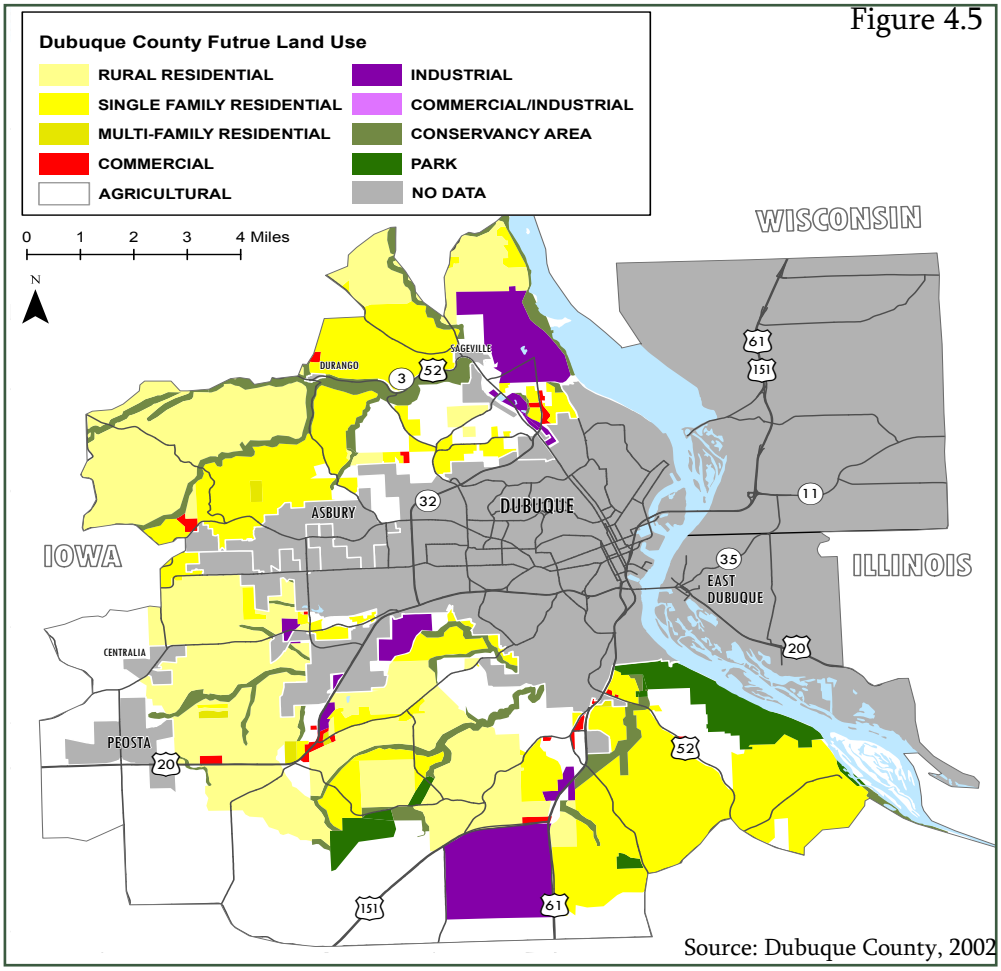


Figure 4.5

Source: Dubuque County, 2002

Land Use Maps

Before travel forecasts are made, it is necessary to determine how the community will look in the future. Transportation is directly linked to land use. Trips are assumed to follow land use patterns. Changes in land use will result in changes in travel patterns. Because of this, land use is and a critical component of the DMATS travel demand model. In the model, Land used data is used to determine where people will live, work, shop, and go to school in the future.

Figure 4.4 displays the 2010 City of Dubuque existing land use map.

Figure 4.5 shows the future land use land use map that was developed in 2002 for the Dubuque County Comprehensive Land Use Development Plan.

Travel Demand Model Output

Figure 4.6

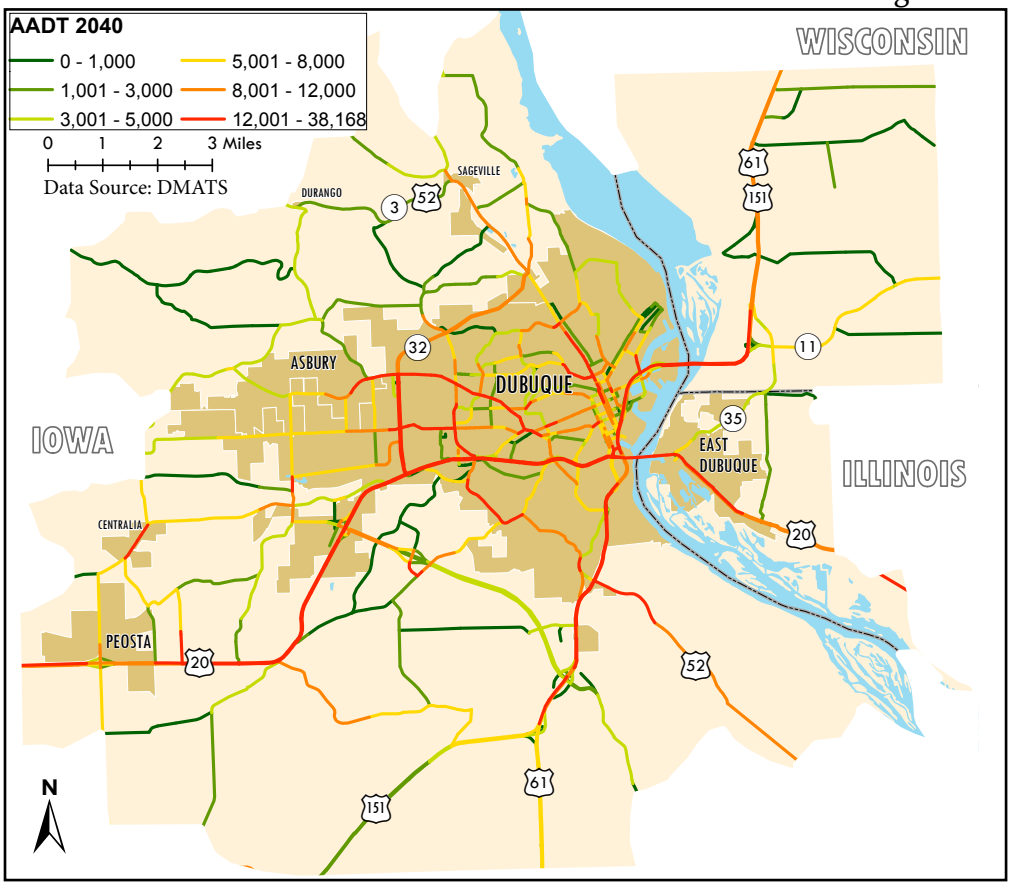
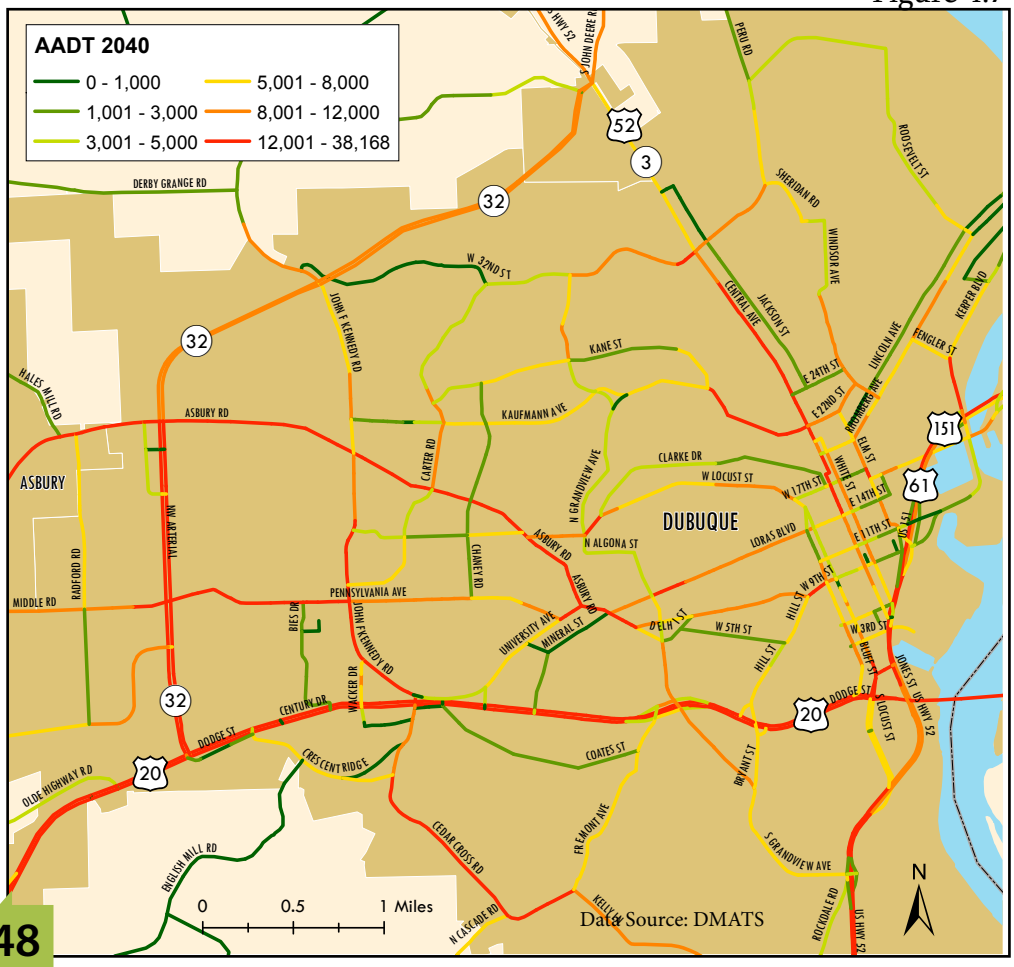


Figure 4.7



2040 AADT

The final output of the travel demand model is the traffic volume for each road segment. Traffic volume is measured in Average Annual Daily Trips (AADT).

Following the initial model run the model is calibrated. The travel that is predicted by the model in the base year is checked against actual traffic counts. Calibration allows the model developer to test the accuracy of the model's predictions. Standards model for calibration are set by the National Cooperative Highway Research Program and the Transportation Research Board. If the predicted traffic volume differs greatly from the observed counts, the assumptions in the model will need to be adjusted.

The maps to the left display the 2040 traffic volumes from the travel demand model. Figure 4.6 displays the AADT for the entire DMATS area. Figure 4.7 displays traffic volumes within the city of Dubuque.

Note the increases in traffic volume from the maps located in Figures 3.2 and 3.3 on page 23.

Figure 4.8

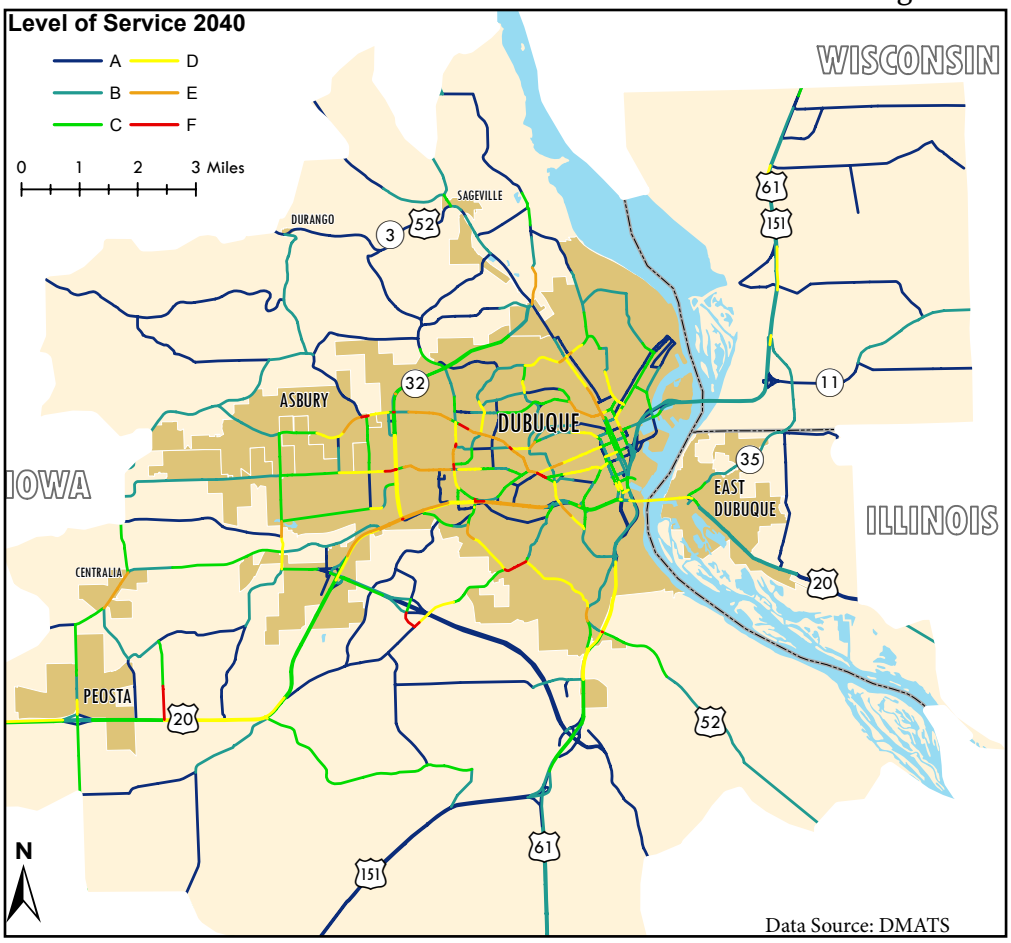
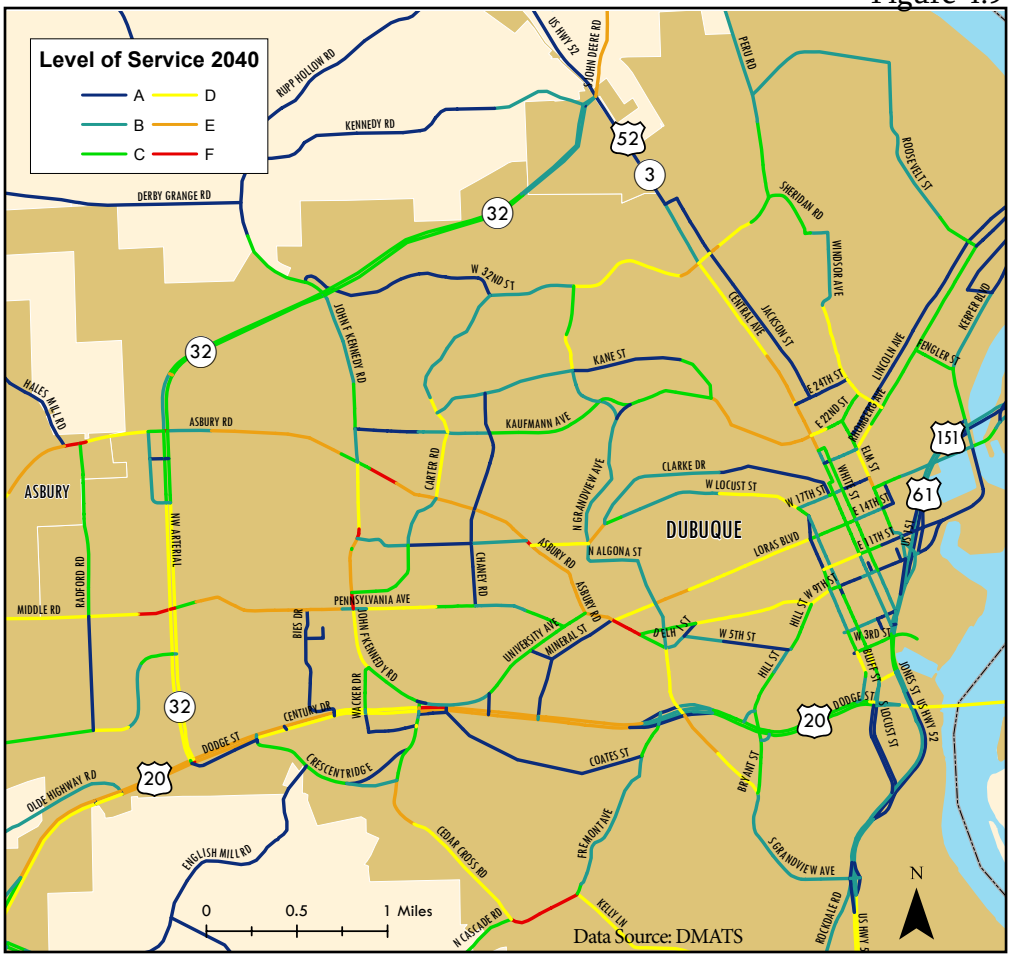


Figure 4.9



Future Congestion

Figure 4.8 shows the forecast of congested roads in the Dubuque Metropolitan Area for the year 2040 based on the DMATS Travel Demand Forecasting Model. Level of Service (LOS) is a qualitative measure describing conditions within a traffic stream, based on speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience

LOS is calculated using the Volume to Capacity (V/C) ratio, where the traffic volume (observed or forecasted)is divided by the estimated capacity of the roadway. Roadways are identified as being over capacity for which the forecast of traffic volume to roadway capacity ratio is over 1.00. This means that the forecast shows that more traffic will attempt to use the road than it is designed to accommodate. LOS A represents complete free flow of traffic allowing traffic to maneuver unimpeded. LOS F represents a complete breakdown in traffic flow, resulting in stop and go travel.

Figure 4.9 shows the 2040 forecast for Level of Service on roads within the City of Dubuque.

Note that when compared to the 2010 LOS maps, (Figures 3.4 and 3.5, pg 24) the number of corridors and intersections rated as LOS E and F has increased substantially.

The number of road segments rated LOS F is forecasted to increase from 7 in 2010 to 27 in 2040.

Intersections

Table 4.1 identifies intersections that, according to the travel demand model, will be over capacity in 2040. Intersections were identified as being over capacity if the 2040 V/C ratio was E or F, and if staff determined that the intersection was the primary cause of the congestion.

Note: V/C ratio only one factor used to identify problem intersections. Intersections with low V/C ratios can be unsafe for various reasons such as low visibility, high speeds, etc. See Iowa DOT Crash data on pages 25-26 for more measures of problem intersections.

Table 4.1

Street	Intersection					
Asbury Rd	Hales Mill Rd	NW Arterial	JFK Rd	Clarke Dr	University Ave	Loras Blvd
Cedar Cross Rd	N Cascade	Fremont Ave	Kelly Ln			
Central Ave	NW Arterial	W 32nd St	Kauffmann Ave			
US 20/ Dodge St	Thunder Hills Rd	NW Arterial	JFK Rd			
E 32nd St	Central Ave					
Fremont Ave	Cedar Cross Rd	N Cascade	Kelly Ln			
JFK Rd	Asbury Rd	Pennsylvania Ave	University Ave	US 20		
Kaufmann Ave	Central Ave					
Loras Blvd	University Ave					
N Cascade Rd	Fremont	N Cascade	Kelly Ln			
NW Arterial	US 52	Asbury Rd	Pennsylvania Ave	US 20		
Pennsylvania Ave	NW Arterial	JFK RD				
Rockdale Rd	Twin Valley Dr	Old Mill Rd				
SW Arterial	N Cascade Rd					
Thunderhills Rd	US 20					
Univeristy Ave	JFK Rd	Asbury Rd	Loras Blvd			

Corridors

Table 4.2 identifies all road segments in the DMATS area that will be over capacity in 2040. The chart includes segment name, length and forecast level of service.

Table 4.2

Segment		Length (Miles)	LOS
ASBURY RD			
Spring Green Dr	Hales Mill Rd	0.41	E
Hales Mill Rd	Radford Rd	0.11	F
CEDAR CROSS RD			
Starline DR	Ace Ave	0.3	E
CENTRAL AVE			
E 26th St	E 21st St	0.6	E
CLARKE DR			
N Grandveiw Ave	W Locust St	0.14	E
DODGE ST W			
Freemont Ave	Brunskill Rd	1.09	E
Brunskill Rd	JFK Rd	0.15	F
Century Dr	Seipple Rd	2.03	E
DODGE ST E			
Old Hwy Rd	Cresent ridge Dr	0.8	E
JFK Rd	Fremont Ave	1.17	E
E 32ND ST			
	Jackson	0.6	E
ELM ST			
E 17th St	E 16th St	0.06	E
FREMONT AVE			
Cedar Cross Rd	Kelly Ln	0.41	F
JOHN F KENNEDY RD			
Hillcrest Rd	Hillcrest Rd	0.05	F
Hillcrest rd	Carter Rd	0.31	E
Carter Rd	Pennsylvania	0.9	F
University Ave Connector		0.02	F
Dodge St			E
KAUFMANN AVE			
Spring Green Ct	Central Ave	0.66	E
LORAS BLVD			
N Grandveiw Ave	Glen Oak St	0.2	E

Segment		Length (Miles)	LOS
N CASCADE RD			
SW Arterial		0.11	F
NW Arterial			
Meinen Ct	JFK Rd	0.74	E
Crissy Dr	Evergreen Dr	0.17	F
EverGreen Dr	Hillcrest Rd	0.8	E
Hillcrest Rd	Clarke Dr	0.3	F
Clarke Dr	Loras Blvd	0.65	E
OLD HIGHWAY RD			
Cox Springs Rd	Sundown Rd	0.74	E
PENNSYLVANIA AVE			
Embasy West Dr	NW Arterial	0.11	F
Donovan Dr	JFK Rd	0.83	E
ROCKDALE RD			
Bellevue Heights	Oak Mill Rd	0.23	E
S GRANDVIEW AVE			
Dodge St	South Hill St	0.27	E
S JOHN DEERE RD			
Diesel Dr	Central Ave	0.65	E
SEIPPEL RD			
Chavenelle Dr	Humke Rd	0.26	E
SW Arterial			
N Cascade Rd		0.31	F
THUNDER HILLS RD			
Thunder Hills View	US 20	0.58	F
UNIVERSITY AVE			
Asbury Rd	Loras Blvd	0.15	E
Loras Blvd	Delhi St	0.17	F
W 32ND ST			
Central Ave	Saunders St	0.12	E

Transit Gap Analysis

The DMATS Travel Demand Model provides a forecast of personal vehicle travel in the area, but the model does not address any other modes of transportation. In order to estimate future needs for other modes, DMATS staff rely on other analysis methods. For transit, DMATS uses a Gap analysis. The Gap analysis involves using public input to identify gaps in transit service. These gaps can then be filled by future projects. The transit Gap analysis used in the 2040 LRTP was produced as part of the DMATS and RPA 8 2011-2015 Passenger Transportation Plan (PTP). The PTP used three methods for gathering input: public input meetings, the Transit Action Group, and surveys. These three methods are described below.

Public Input

Public input meetings were held in 2009 for all four counties (Dubuque, Delaware, Jackson, and Clinton). These meetings were presented as an opportunity for the public to discuss the current transit system in their area and provide feedback on how to make the system smooth for consumers.

Transit Action Group (TAG)

The TAG dissolved in 2007 due to lack of interest. However, the public input meetings were aggressively marketed to gain as much public feedback as possible. With the public input meetings, it was evident that the need to start up the TAG again was crucial. This group started up again in December, and initiated with an entirely new focus and selection of members. With a new focus, and clear direction, it is hoped that this group would become permanent for the consumers, human service providers, transit providers, and the annual Passenger Transportation Plan document.

PTP Surveys

Passenger Transportation Plan surveys were sent by mail and electronically to over 500 agencies and consumers for all four counties. Ninety two (92) surveys were completed and returned. This figure does not include those in attendance for the Public Input meetings.

Below is a list of needs for each provider that the public recommended during the PTP study:

Needs: The City of Dubuque and East Dubuque, IL (The Jule)

Expand hours and days of service to include evenings, weekends, and holidays. Residents of Dubuque County overwhelmingly requested this service. Expanded hours of service will provide consumers with access to a greater number of employers and the ability to work a wide range of shifts. This service will also improve employers' ability to hire qualified applicants throughout all shifts.

Provide service to Key West and the West End. Consumers and human service providers suggested an increase to these routes. With the expanding housing and commercial market in the West End and Key West, many residents need daily access.

Expand services within the City of Dubuque. Consumers stated that if the buses were to expand within the downtown area, residents would have a greater access to organizations and services offered. This could also reduce wait times and the frequency of pick ups.

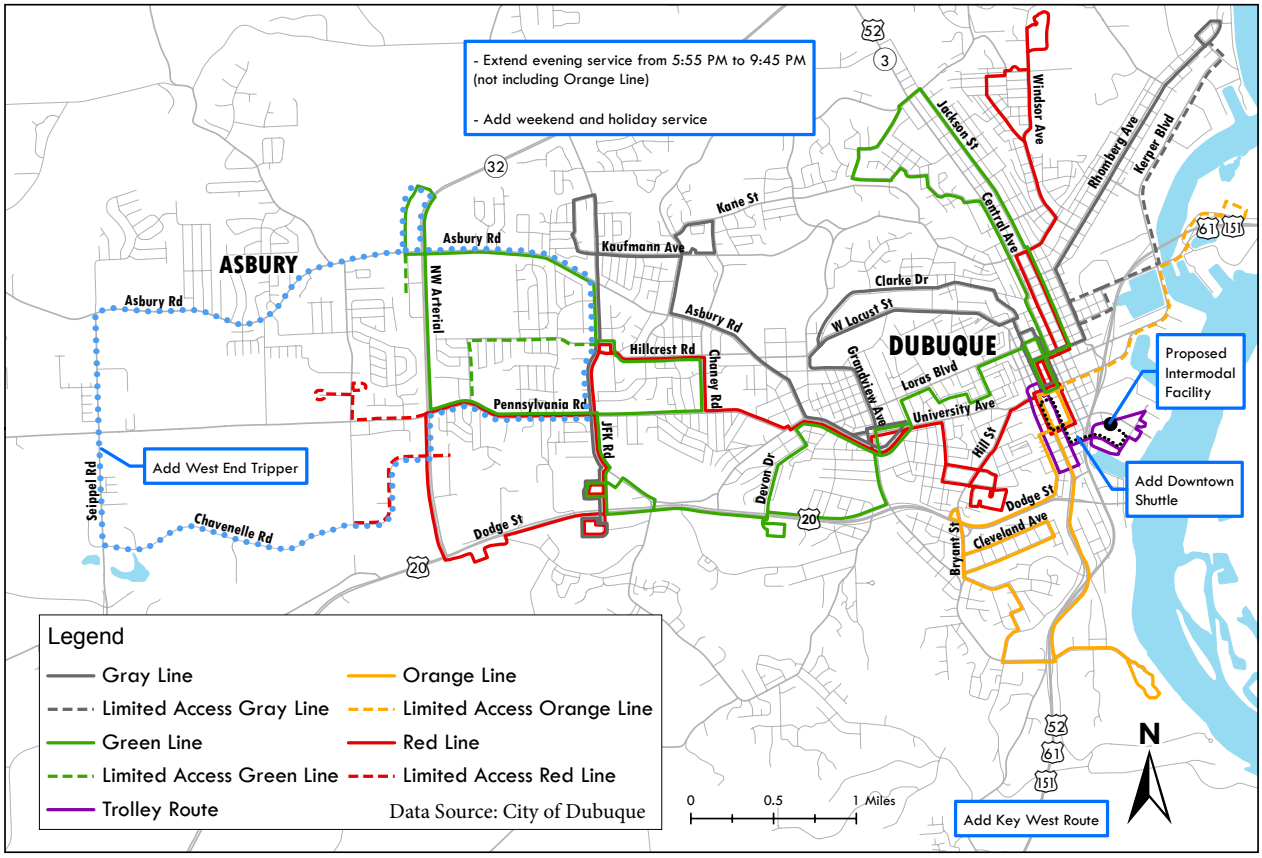
Reduce headways, increase the number of bus stops, and improve service for the disabled. The Jule needs to improve service for the disabled because other than cab service, which is not handicapped accessible, transit is their only option for transportation.

Reduce cost of service. Low income riders, who need to ride the bus frequently throughout the day, pay a significant amount of their income in fares. Low income consumers would like to see service fares eliminated or reduced in an effort to reduce their financial burden.

Provide a passenger rail service between Chicago and Dubuque. This service would increase tourism and economic development.

Figure 4.10 maps transit service input from Dubuque residents.

Figure 4.10



Dubuque County (RTA)

Provide fixed route to West End neighborhoods. The Jule and the RTA consumers requested additional routes to the western portion of the DMATS area, i.e. Asbury, Peosta, and the West End of Dubuque. Residential and commercial districts are expanding rapidly in the west side, but sprawling development patterns make walking to these destinations difficult. Increased transit service will provide west side residents and non-residents with access to more businesses, services, and employment opportunities.

Expand Services within the City of Dubuque. Residents of Dubuque and many human service providers requested this service. Additional RTA service within City limits would supplement services provided by The Jule. The service could provide a quality transportation option to residents who are not able to ride The Jule.

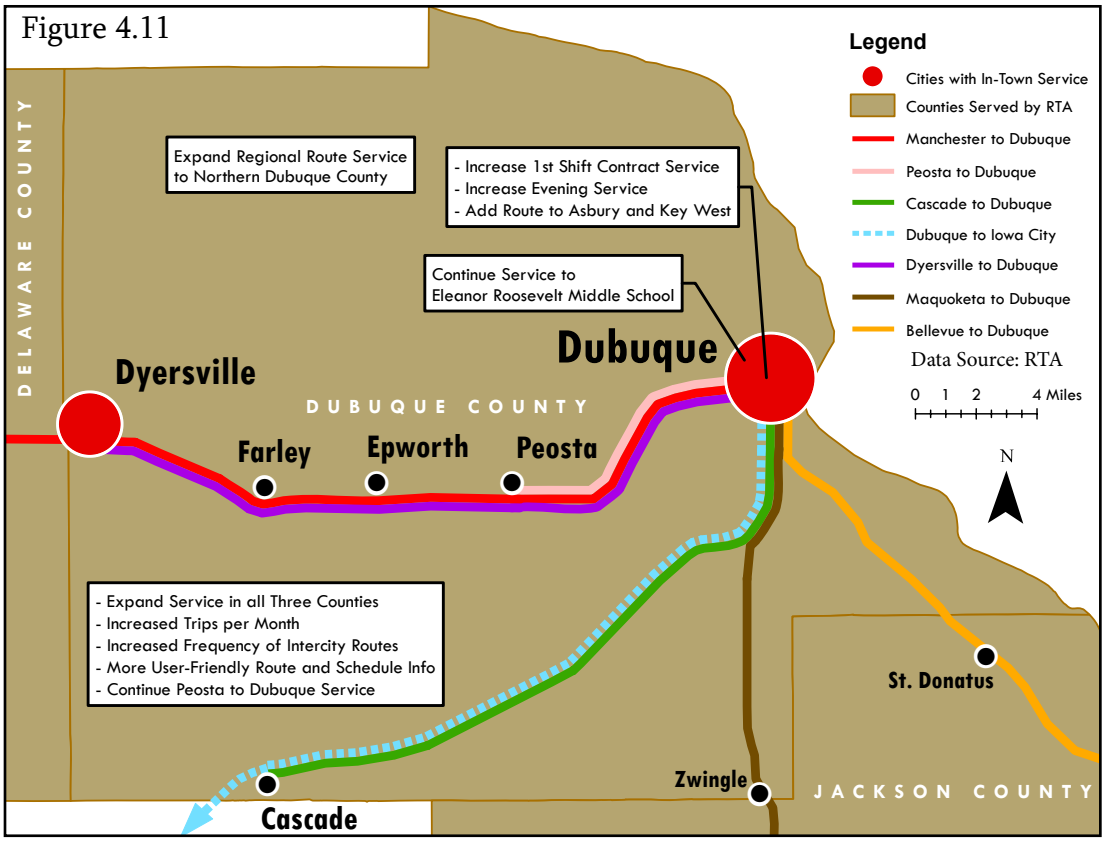


Figure 4.11 displays input from Dubuque County Residents.

Transportation Priorities

The public was asked to place these projects in a ranking of priority through an online survey. The projects were ranked as "high", "medium" and "low". Projects ranked as a high priority were listed first and the lowest priorities last. Table 4.3 contains the results from the online survey.

Table 4.3

Regional Transit Authority	
1	Expand hours and days of service
2	Maintain a consistent schedule
3	Expand Services within Dubuque
4	Expand services to West end
5	Add an extra Iowa City route
6	Offer same day service or demand response in Jackson Co.
7	Offer more affordable services
8	Educate community and market services
9	Offer additional routes from Dyersville to Dubuque
10	Coordinate with Manchester health clinic's schedule
11	Offer same day service or demand response in Dubuque Co
12	Expand Services in Delaware County
13	Market employer incentives for mass transit
14	Post announcements on RTA website
15	Expand routes within Jackson County
16	Add an extra bus for ARC services in Dubuque
17	Add more wheelchair accessible buses
18	Provide training to drivers on wheelchair tie downs
19	Add a fixed route from Manchester to Dundee

The Jule	
1	Expanded hours and days of service
2	Provide a greater accessibility to services
3	Expand services within community
4	Cover a greater geographic area (Key West & West End)
5	Market employer incentives for mass transit
6	Educate community about route information and widely market services
7	Offer more affordable services
8	Purchase more accessible busses
9	Install bike racks

The Jule Operational Analysis

Another resource for transit planning is the *The Jule Comprehensive Operational Analysis.* In 2009, the City of Dubuque contracted with LSC Transportation Consultants, Inc. to complete an Operational Analysis of The Jule, the city's transit system, with a focus on determining the needs for future service expansion; identifying efficiencies in providing both current and future services; and providing recommendations on system improvement. The overall approach to this project was to collect and evaluate boarding data, review origin-destination information, provide an analysis of demand, and review operational characteristics. These processes allowed LSC to make recommendations for a preferred service, facility, and capital plan that will serve the residents of Dubuque efficiently and effectively.

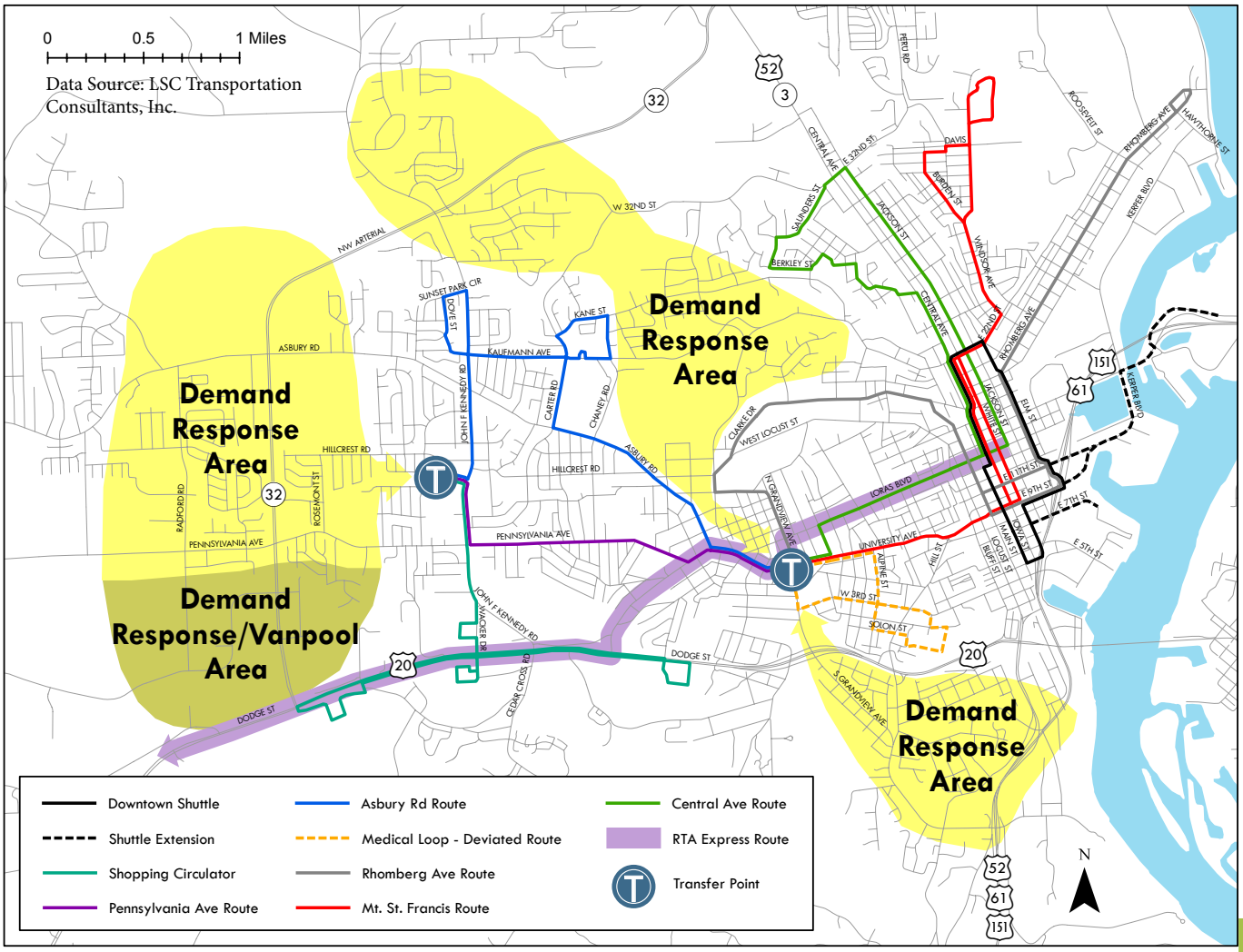
Fixed Route Issues

Some of the preliminary issues that were observed with the fixed-route system deal with the ability to transfer buses due to the timings at transfer points. The topography and geography of the area also makes it difficult to provide an east/west connection. The system has major origins in the Eagle Point neighborhood, with major destinations in the West End.

Route and Schedule Changes

The following changes are recommended for the current routes. In some cases the routes are changed. The recommendation for the Orange Route is elimination of the fixed route and replacement with a demand-response service zone. The proposed changes are shown in Figure 4.12.

Figure 4.12



Future Bicycle and Pedestrian Facilities

Unlike road network planning, there is no modeling process for forecasting future demand for trails. However, there are several criteria used within the DMATS area to locate areas of high demand bike and pedestrian facilities, and to identify barriers to walking and biking. Land use maps, commuter patterns, crash data, and the location of bike and pedestrian barriers are used by area bike and pedestrian facility planners to guide the location of future bike and pedestrian projects.

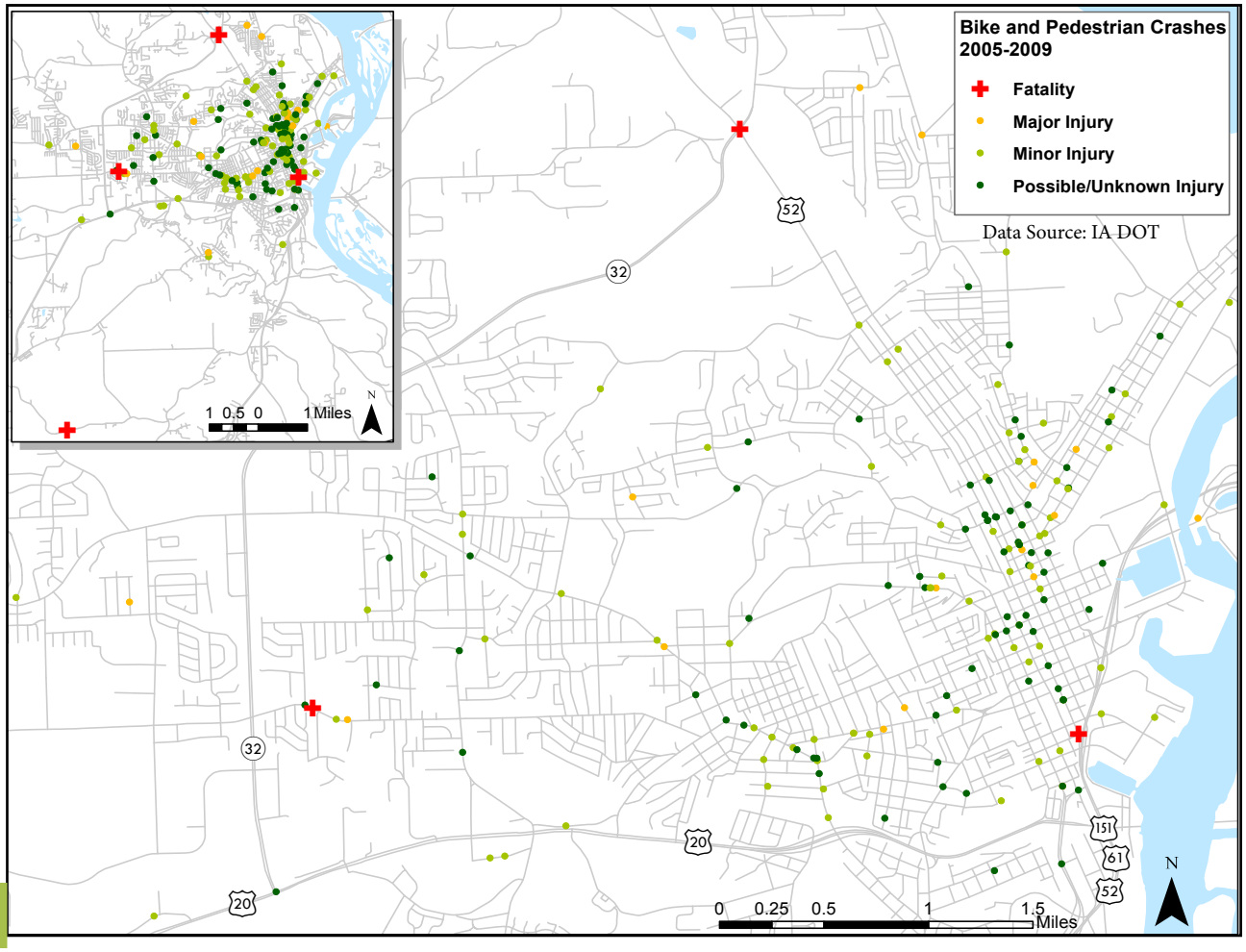
Land use maps can be an important means for determining areas of high demand for walking, bicycling, and hiking. It is important to look at where existing residential, commercial, institutional (schools, government offices, and libraries), and industrial areas are located in comparison to existing and planned walking and biking facilities. This will help determine gaps in the network as well as key destinations for bicyclists and pedestrians. See Figure 4.4 for the City of Dubuque's existing land use map.

Future land use maps can also provide some insight into the location of future residential, commercial, institutional, and industrial development. See Figure 4.5 for the Dubuque County future land use map. This information can help in determining where future growth within the bicycle and pedestrian network should occur.

Bicycle and Pedestrian Crashes

The location of pedestrian and bicycle accidents can provide information on where safety improvements are needed. From 2005 to 2009 there were 179 accidents involving pedestrians and bicyclists in the DMATS area. Four of those accidents resulted in a fatality. Figure 4.13 shows the location and severity of the accidents.

Figure 4.13



Commuter Patterns

The routes vehicles take for daily activities can help determine a desirable route for pedestrians and bicyclists. An integrated walking, bicycling, and hiking network needs to provide connections to residential, commercial, and industrial areas in order for it to compete with personal vehicles and transit as a valid transportation alternative. Using the DMATS travel demand forecast model to study the heaviest traveled roadways within the DMATS area can help planners identify key destinations for cyclists and pedestrians. Vehicle volume and type of vehicles present can also help determine where alternative pedestrian and bicycle facilities should be located for safety reasons.

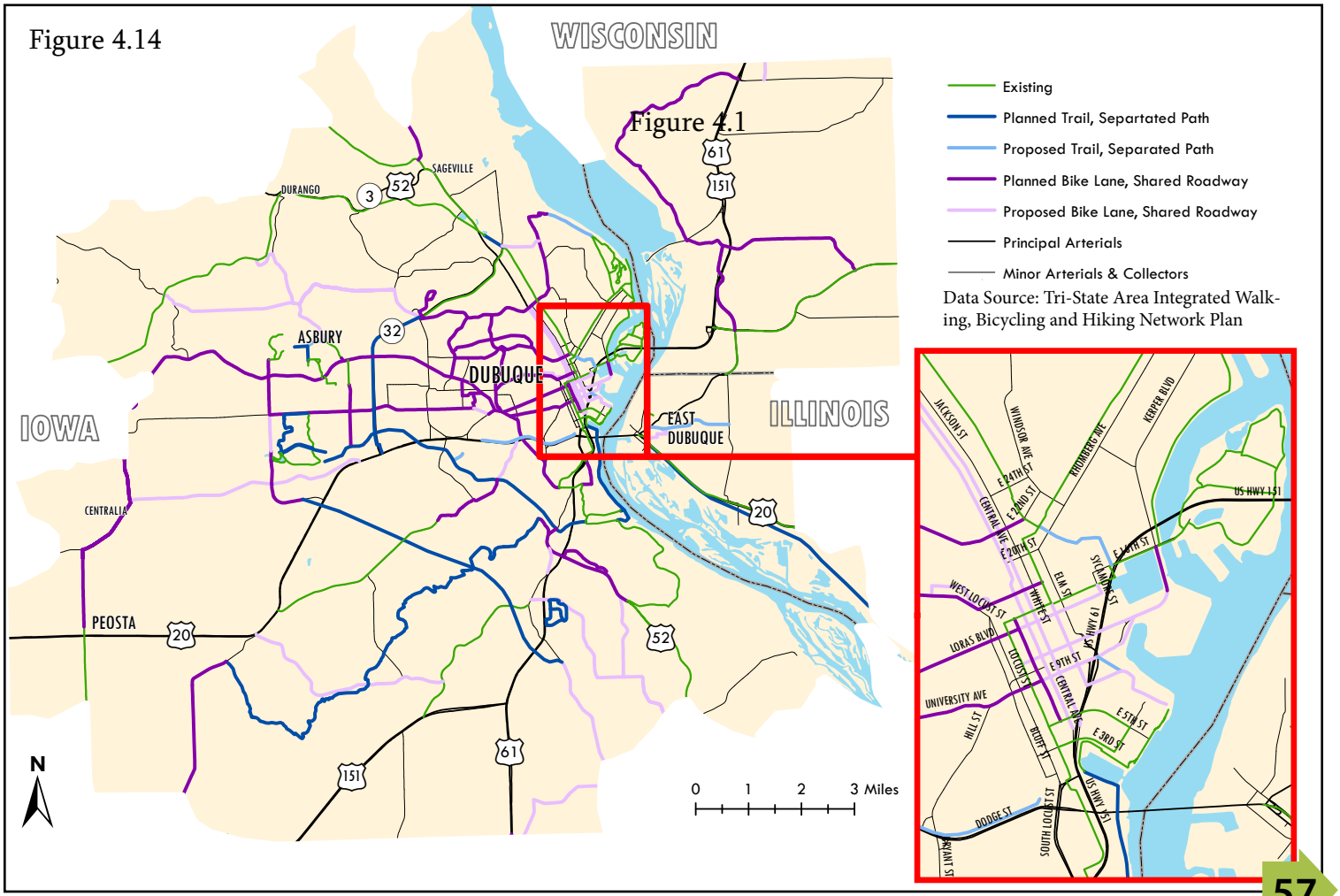
Bicycle and Pedestrian Barriers

The DMATS area presents many challenges to pedestrians and bicyclists. Steep inclines, streets with heavy traffic, waterways, and railroad right-of-ways present barriers that prevent residents from walking or biking to their destination. The challenge for bicycle and pedestrian planners is to identify and mitigate these barriers when locating new facilities.

Planned and Proposed Facilities

Figure 4.14 shows the planned and proposed bike and pedestrian facilities in the DMATS area. All projects in the map are regarded as illustrative, as none have a dedicated source of funding. For planned facilities, the planning process has been completed and the projects are awaiting funding. Proposed facilities are also awaiting funding, but projects are in the early stages of the planning process. For a detailed description of planned and proposed bicycle and pedestrian facilities, please see the *Tri-State Area Integrated Walking, Bicycling and Hiking Network Plan*.

Figure 4.14

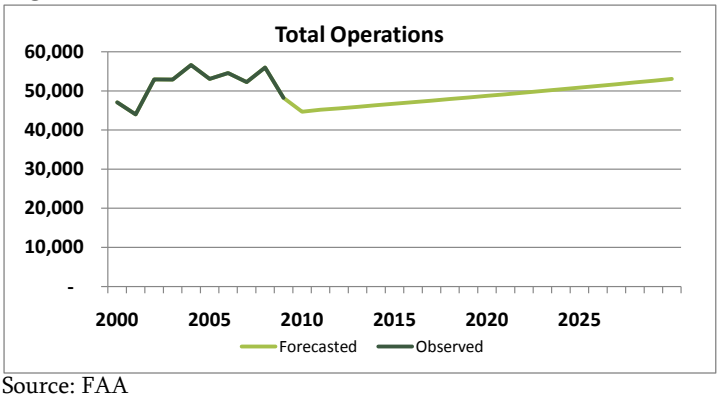


Future Airport Plans

Airport Forecasts

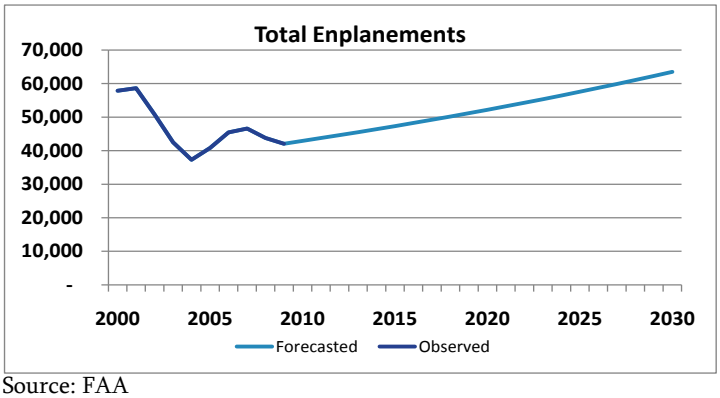
The Federal Aviation Administration (FAA) produces annual Terminal Area Forecasts (TAF) for active airports in the National Plan of Integrated Airport systems. TAF reports include forecasts of enplanements, aircraft operations, and number of based aircraft. Figures 4.15 and 4.16 show the observed operations and enplanements from 2000 to 2009 and the TAF forecasts to 2030. The events of 9/11, the loss of an air carrier, and the recent economic recession have negatively impacted airport activity over the past decade. The TAF forecasts expect a reversal of this trend, with a period of steady growth in both operations and enplanements over the next twenty years.

Figure 4.15



Source: FAA

Figure 4.16



Source: FAA

Terminal Project

The Dubuque Regional Airport is currently in the process of building a new passenger terminal. The current passenger terminal was built in 1948 and expanded in 1969. The current terminal has several issues including an inadequate number of aircraft gates, inefficient circulation, inadequate area for the building's purposes, and limited vehicle parking. The new terminal will be designed for approximately 62,500 annual enplanements, 80 peak hour enplanements, 3 airlines, 3 aircraft positions, and approximately 650 parking spaces. A terminal built to these specifications will accommodate ten year demand levels. The terminal will be designed to accommodate expansion to 20 year demand levels. The proposed project will include:

- Passenger terminal building (33,151 sq ft)
- New terminal apron and apron access taxiways
- New parallel taxiway to runway 13/31
- New automobile parking lot
- US Hwy 61 and Merlin Lane intersection improvements
- New terminal entrance and circulation roads
- New utility services

The current estimated total project cost is approximately $39,970,000 over a seven year period. Of that total cost, the FAA will provide $35,270,000 (88%), with a local share of $4,700,000 (12%). The local share will be a combination of Iowa DOT grants, passenger facility charges, customer finance charges, and City of Dubuque funding.

Future Passenger Rail

In mid 2006, the State of Illinois doubled its funding for existing state-supported Amtrak routes. In August 2006, the Illinois DOT's Director sent a formal request to Amtrak for a feasibility study regarding possible service between Chicago, Rockford, Galena, and Dubuque. The resulting report, published in 2007, identified one feasible route between Dubuque and Rockford, and four feasible routes between Rockford and Chicago.

Route A	Chicago-Elgin-Rockford-Galena-Dubuque Via Amtrak-Metra-UP-CN
Route B	Chicago-Elgin-Genoa-Rockford Airport-Rockford-Galena-Dubuque Via Amtrak-Metra-ICE-IRY-CN
Route C	Chicago-Elgin-Genoa-Rockford-Galena-Dubuque Via Amtrak-CN
Route D	Chicago-Elgin-Genoa-Rockford-Galena-Dubuque Via Amtrak-Metra-ICE-CN

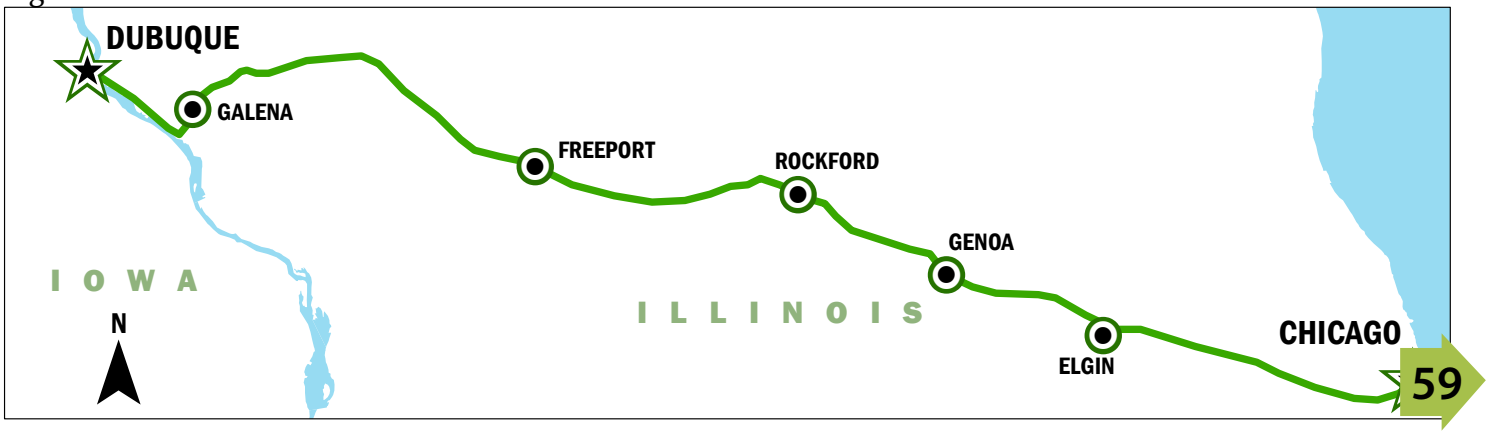
In 2010 the Illinois DOT requested an update of the 2007 report. The updated report, released in November 2010, reduced the routes up for consideration to two, Route A and Route C. The report analyzed the routes based on performance, ridership, and cost. The analysis published in the report is summarized in table 4.4.

Table 4.4

Route A and Route C Summary Table			
Key Characteristic	**Route A**	**Route C**	**Comments**
Mileage	184.0	182.2	Shorter trip
Travel Time	5:25	5:10	Shorter trip time
Number of Rail Carriers	4	2	Fewer carriers
Estimated Annual Ridership 2007	53,600	74,400	Better ridership
Estimated Annual Ridership 2010	55,000	76,400	Better ridership
Estimated Annual Revenue	$1.2 M	$1.6 M	Higher revenue
2010 Capital Cost	$62.3 M	$26.2 M	Lower capital cost
Number of Grade crossings	176	143	Safer operations
Best meets cost, reliability, and performance tests.			

Based on the performance analysis, Route C was chosen over Route A. The project is expected to cost $60 million to compete. Once daily service between Chicago and Dubuque is expected to begin in early 2014. See Figure 4.17 for the proposed route.

Figure 4.17



Future Freight Plans

Future road and waterway projects will impact traffic on primary freight corridors.

SW Arterial

The SW Arterial project will impact the movement of freight through the DMATS area. Currently, freight traffic originating in Dubuque's North End heading south to US Hwy 61/151 travels on Central Avenue into congested downtown Dubuque traffic. The SW Arterial will allow freight traffic to bypass downtown Dubuque, thus reducing congestion. Freight traffic will also be reduced on US Hwy 20, as trucks will be able to easily access US Hwy 151/61 from US Hwy 20 on the west side of Dubuque.

US Hwy 20 West

Projects are planned for the US Hwy 20 corridor west of the NW Arterial to the Peosta interchange. The primary project involves intersection improvements at North Cascade Rd. The project has been identified as priority by the Iowa DOT, but has not been included in the five year TIP.

US Hwy 20 East

The Iowa DOT has proposed a project that would expand the capacity of the Julien Dubuque Bridge. The project will expand the capacity of the bridge, which will improve the flow of freight traffic on US Hwy 20.

US Hwy 151/61

The Iowa DOT is planning for repair work on the US Hwy 52/61/151 bridge over Catfish Creek. In conjunction with the bridge work, the City of Dubuque is planning ITS improvements along the US Hwy 52/61/151 corridor. The project will include fiber optic communication installation and the addition of traffic monitoring cameras. Both projects will improve safety for freight traffic on this corridor.

US Hwy 52 North

The Iowa DOT has several safety improvement projects planned for US Hwy 52 north of Dubuque. The project will include pavement widening and guardrail installation. The project will improve safety freight traffic on the corridor.

Barge

Construction and rehabilitation work on the country's inland waterway system, including the Mississippi River's lock and dam system, is funded by the Inland Waterways Trust Fund (IWTF). The IWTF is funded through a $0.20 per gallon tax on fuel used in commercial transportation on inland waterways. A $47.3 million rehabilitation project was completed on Lock and Dam 11 in 2008. The rehabilitation included resurfacing the lock chamber, repairing concrete, replacing the lock machinery, and replacing the lock's electrical systems. Other improvements on Lock and Dam 11 will be required to ensure its long term operation, but no work has been scheduled at this time.

Future ITS Plans

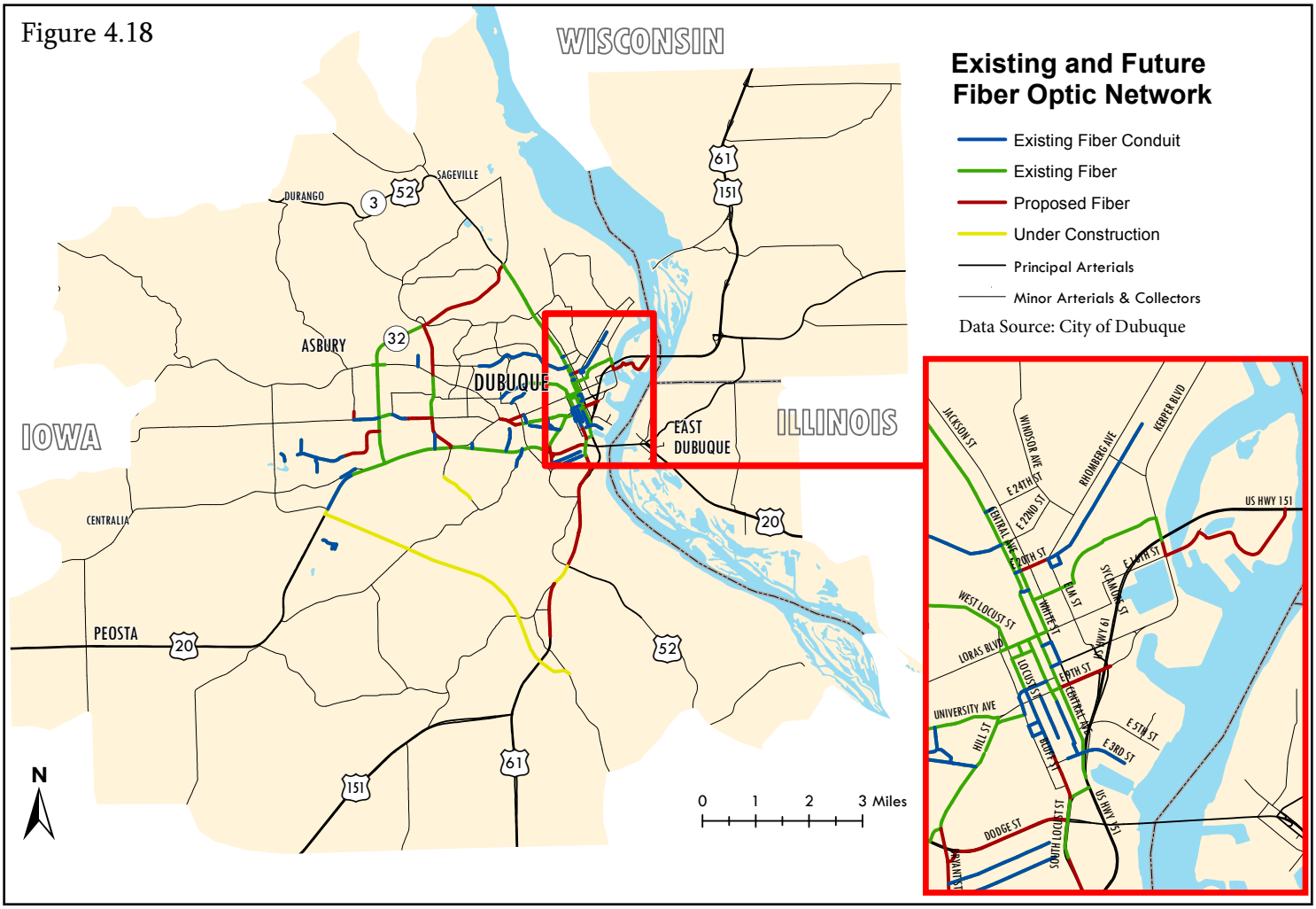
The City of Dubuque is and has been committed to continuing to improve traffic flow within the City as well as incorporating appropriate Intelligent Transportation Systems (ITS) type assets where necessary. Given this, the City of Dubuque has begun construction of a fiber optic backbone along the Iowa Highway 32 (Northwest Arterial) and through other parts of the downtown area. A long term signal communications loop would minimize the impact of losing signal communications.

The City of Dubuque has undertaken a program to install fiber optic conduit and advanced ITS components into all new or reconstructed traffic signal controllers throughout the City of Dubuque. The need for monitoring traffic and adapting signal plans to changing conditions has led the City to install four-inch multi-ducted conduit under all new roadways to accommodate future fiber optic communications cable.

The City of Dubuque has invested in a robust Traffic Operations System that uses advanced communication technologies along with state of the art traffic control equipment that allows management of the operations via a Traffic Operations Center (TOC) located at City Hall.

Figure 4.18 displays the City of Dubuque's existing and future fiber optic network. More detailed information on future ITS projects can be found in the City's Intelligent *Transportation System Plan*.

Figure 4.18



Conclusion

Movement of people and goods is key to the growth and prosperity of the region. The forecasts presented in this chapter have identified several issues that the DMATS area will encounter in the next thirty years. If not planned for properly, these issues could negatively impact economic growth, environmental health, and overall quality of life in the region. DMATS has developed a list of recommendations that will help maintain and improve the transportation network in the region. The recommendations are based on input from staff, public input from the previous long range plan, and information collected for current projects. New recommendations will be added to the list as input is gathered throughout the planning process. These recommendations will help guide the project selection and ranking processes.

Recommendations

Roadways

- Reduce the number and severity of vehicle crashes on the area's roadways.
- Invest in road projects that encourage long term economic development.
- Maintain the quality of the existing roadway network.
- Promote projects that reduce vehicle emissions and improve general environmental quality.
- Reduce traffic congestion.

Transit

- Improve mobility for low income, disabled, and elderly residents.
- Expand hours and days of service.
- Increase public awareness of transit services.
- Reach out to underserved segments of the population.

Bicycle and Pedestrian

- Incorporate Complete Streets design elements into future road projects.
- Improve the connectivity of the bike and pedestrian network.

Airport

- Connect the DMATS region to the regional and global economy through air transportation.

Passenger Rail

- Establish passenger rail service from Dubuque to Chicago.

Freight

- Maintain and improve freight facilities.
- Reduce costly delays and detours.

Intelligent Transportation Systems

- Expand the fiber optic network.
- Install advanced ITS components that improve safety, mobility, and the environment.

According to SAFETEA-LU, It is the obligation of DMATS to consider public input in the long range transportation planning process. Collecting input from the public is a crucial step in the long range panning process, as well as all other planning activities conducted by DMATS. For the 2040 LRTP update, DMATS staff held workshop meetings with local government officials, the Tri-State Trail Vision, several neighborhood associations, and the Transit Action Group. The public input process for the 2040 DMATS LRTP was done in accordance with the *DMATS Public Involvement Policy*.

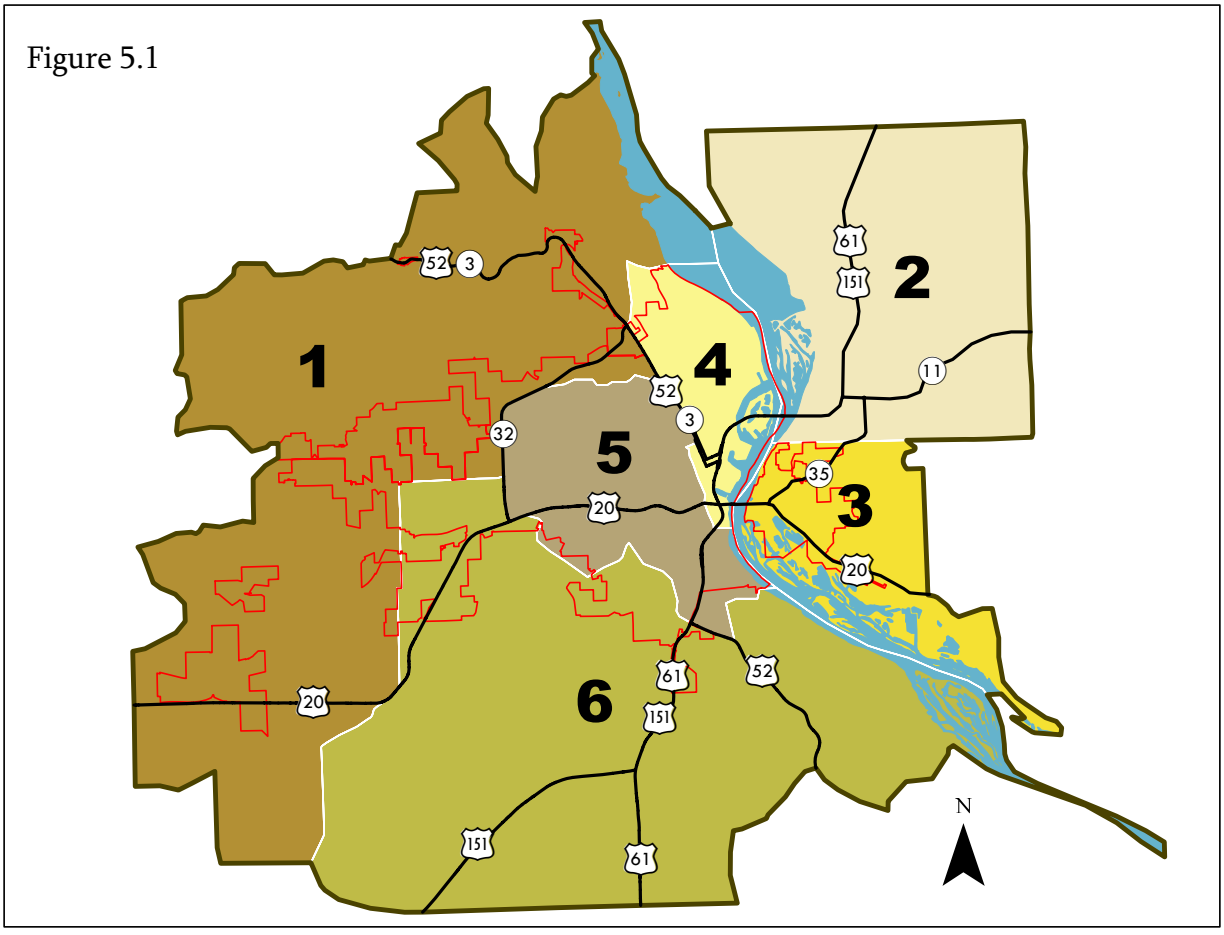
Input Zones

The DMATS area is made up of several distinct districts containing diverse populations that require different public services. To adequately serve the needs of these unique districts, DMATS staff divided the area into 6 participation zones and conducted a public input meeting in each zone. Holding a meeting in each zone not only helped ensure that all residents' voices were heard, but it also helped residents draw a connection between local issues affecting each district and the region wide policies being proposed in the LRTP.

The districts were delineated based on TAZ and state boundaries. The Illinois and Wisconsin portions of the DMATS area were designated as one zone each. The remaining four zones were distributed across the Iowa portion of the area. Zone boundaries were drawn so that areas included in each zone had similar land use, demographic, and transportation characteristics.

Figure 5.1 shows the six public input zones.

Figure 5.1



Local Government Input

DMATS staff gathered input from City of Dubuque, City of Asbury, City of Peosta, and Dubuque County. Input was gathered at a series of workshop meetings that were held between November 3rd and December 15th of 2010. The DMATS area was divided into zones, and each meeting focused on a different zone. Staff members representing city and county departments provided information on current and future projects within the zones. In addition to gathering input for the LRTP, a secondary objective of the workshops was to give the departments a forum where they could discuss and coordinate future projects.

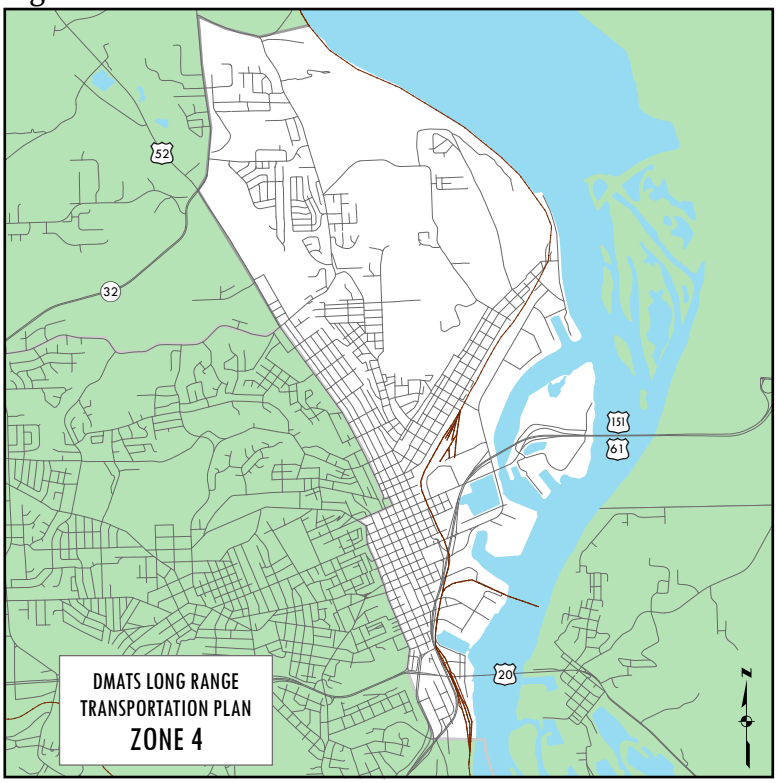
Meeting 1- Zone 4

Zone 4 contains the Downtown and North End districts. It is bounded on the north by Riverside Drive, on the west by Central Avenue and Bluff Street, and on the East by the Mississippi River.

Table 5.1
Public Input Workshop 1
Zone 4 - Downtown and North End

Name	Department
Jon Dienst	Engineering
M R Corrigan	Health
Scott Crabill	Police
Kevin Klein	Police
Terry Tobin	Police
Dave Ness	Engineering
Bob Schiesl	Engineering
Aaron DeJong	Economic Development
Kyle Kritz	City Planning
Marie Ware	Parks and Rec
Barbara Morck	The Jule
Jake Ironside	ECIA
Chandra Ravada	ECIA
Dan Fox	ECIA

Figure 5.2



Engineering

Current Projects

Millwork District Street Projects - Currently working on 6 blocks of Jackson St.

Jackson between 5th and 7th will have multi use bike lanes

10th St between Jackson and Elm will have improved streetscaping with a dedicated bike lane.

For 9th and 10th Streets the emphasis will be on making improvements for cyclists and pedestrians. This will include the installation of bumpouts that will reduce crossing distance and space for amenities such as benches. 9th St will have improved walkways, lighting, and a shared bike - vehicle lane.

Future Projects

ITS Improvements -The overall goal is to create a matrix of fiber optic lines throughout the downtown area.

Fiber is currently being installed as part of the Central Avenue project.

Future plans included creating a fiber loop around the city on US 20 and NW Arterial.

Police

Current Projects

Cameras - Police can use the cameras that are being installed by the city in emergency situations and criminal investigations.

Future Projects

Port of Dubuque Access - Currently, 3rd St is the only permanent access to the Port. 5th and 7th street access points could be blocked by rail traffic. With limited access, major events are a challenge. e.g. Vice President Biden's visit. Direct access from the Port to US 151 would be ideal.

Economic Development

Current Projects

Millwork District - The Dubuque Economic Development Department is currently working on redeveloping the Caradco building on 10th and Washington Streets. Renovations work is expected to begin in early 2011. The finished project will have 200 apartments and 30,000 sq. ft. of commercial space.

Future Projects

Millwork District - If demand for space is not filled by the Caradco project, the next project will be the Farley & Loetscher Building. If demand for downtown space is not filled by the previous projects the Kerby Building is next in line for renovations.

The Millwork District project is expected to take 15 years to complete, if everything goes well. Once completed these three projects will contain 700 residential units and 30,000 sq ft of commercial space.

Port of Dubuque - mixed use development with retail on first floor and commercial on upper floors. Residential would also be possible in this development. A baseball stadium has also been considered for the Port.

The Jule

Current Projects

New Routes - The Jule has received funding for two new routes: The Medical Loop and The Shopping Loop.

Future Projects

Intermodal Facility – 3 possible sites. 2 South of US 151/61 on one on the ball park site, and one north of McGraw Hill Building. The third site is located north of US 151/61. The project is dependent on funding.

Downtown Transfer Site – The current transfer site is located at Iowa St and 6th St. If intermodal facility is funded, the downtown interchange could be moved there.

City Parks and Recreation

Current Projects

Bee Branch Creek Restoration

Port of Dubuque Marina

Future Projects

In the future connecting existing park areas together will be a primary priority.

Street trees in the Millwork district.

The Milllwork District project will bring more people downtown, which will increase the demand for open space. People living downtown will need a place to take pets.

Discussion

The second half of the meeting was an open discussion where participants discussed future projects and potential areas for collaboration. Workshop participants created a map of future projects within Zone 4.

Cameras

Install cameras at strategic intersections in Zone 4. Traffic engineers will use the cameras to monitor traffic. Traffic Cameras provide the following:

- Smooth out traffic congestion (which can lead to costly and deadly accidents)
- Give real-time road up-dates
- Gather Data on traffic snarls and patterns (used for daily management of the system)
- Used during traffic timing studies to confirm the smooth traffic flow.
- Police Department will use footage from the cameras in emergency situations and criminal investigations.

Fiber Optic Communications

The City of Dubuque has been installing fiber optics throughout the city for future traffic signal communications and to aid other city entities. These fiber optic lines are installed along roadways and are terminated at traffic control devices along the route. Once tied into the fiber, these devices are all connected and interact with equipment back at the TOC.

Several departments will benefit from the installation of fiber optics.

Transit – Cameras can be used for bus stop monitoring to ensure passenger safety.

Police – Cameras can be tied in to the fiber optic network. While their main purpose is traffic control,

cameras can also be used in police investigations and emergency situations.

Engineering – Fiber optics allow the engineering department to tie in multiple devices and control them from one location. Devices used for traffic control include traffic signals, smart sensors, video detection, PTZ cameras, and DMS boards.

Parks

Parks will provide open space to new downtown residents. New parks will act as an amenity, attracting more residential development to the area.

Pedestrian and Bicycle Improvements

These projects include trails, bike lanes, designated bike routes, sidewalks, and safety improvements. Bike and pedestrian projects will have positive impacts for several city departments.

Engineering – Bike and ped projects give provide an alternative to the automobile. More people walking and biking can help reduce traffic congestion.

Economic Development - Bike and pedestrian improvements help make Zone 4 more walkable. Residential and commercial development will be attracted to Zone 4 because destinations will be accessible on foot or on a bike.

Police -Bike and ped projects improve safety by reducing crossing distances, creating awareness of pedestrians and cyclists, and separating pedestrians and cyclists from high traffic volumes.

Health – Bike and ped improvements will encourage a more healthy and active lifestyle.

Street Improvements

Improvements to the street network will help improve traffic related issues, and will provide access to development using all modes of transportation.

Intermodal Facility

The intermodal facility will encourage the use of public transpiration, which will reduce traffic congestion. AMTRAK service and bus interchange will improve the accessibility and will bring more visitors to Zone 4

Primary Zone 4 Issues

New development in the Millwork District will create new opportunities and challenges in Zone 4..

Port of Dubuque and Millwork District mixed-use development

Connectivity. Specifically access to the Port of Dubuque.

ITS

Traffic congestion

Figure 5.3

DMATS Long Range Transportation Plan 2037

Zone 4 Workshop Input

Future Road Projects

Future Trail Projects

Future Cameras

1. Intersection Improvements at NW Arterial and US 52
2. Bee Branch Project
3. Millwork District Project
4. 7th Street Reconstruction
5. Trail extensions connecting downtown, Schmitt Island trails, and the Port of Dubuque
6. Future dog park at Dodge and Locust
7. Trail extension from Ice Harbor south along the riverfront
8. Fiber extension from Central Ave along E 24th to park
9. Green Alleys between White, Jackson and Washington Streets from E 15th to E 19th Streets
10. Cameras installed at multiple locations, denoted with blue circles.

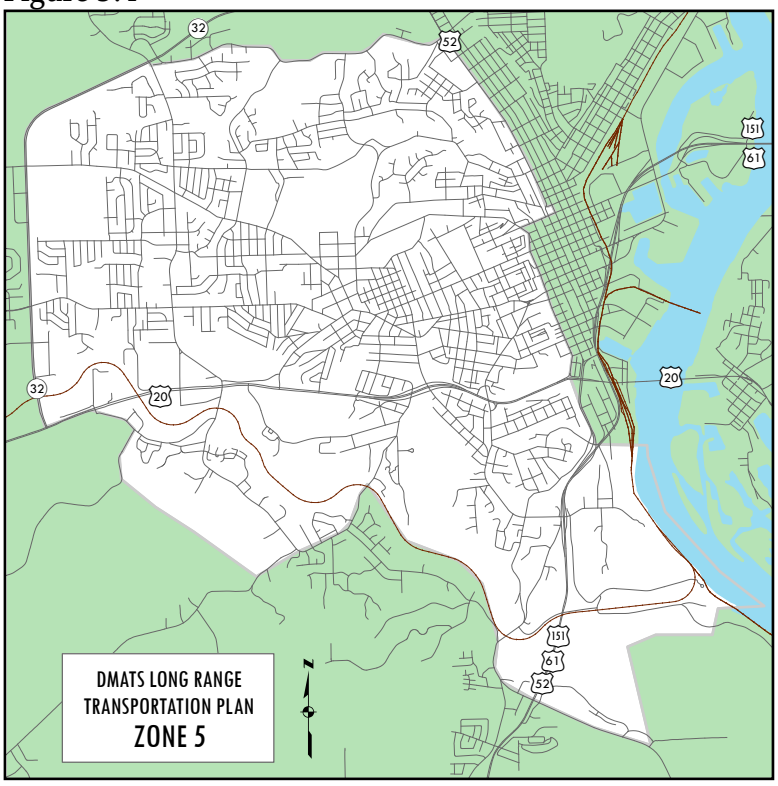
Meeting 2 - Zone 5

Zone 5 contains the eastern portion of the West End district. It is bounded on the north by East 32nd Street, on the west by Northwest Arterial, on the south by English Mill Road, Fremont Avenue, and US 52, and on the East by Central Avenue and Bluff Street.

Table 5.2
Public Input Workshop 2
Zone 5 - West End

Name	Department
Jon Dienst	Engineering
M R Corrigan	Health
Scott Crabill	Police
Kevin Klein	Police
Terry Tobin	Police
Mark Ludescher	Dubuque Fire Dpt.
Aaron DeJong	Economic Development
Marie Ware	Parks and Rec
Kyle Kritz	City Planning
Jake Ironside	ECIA
Chandra Ravada	ECIA
Dan Fox	ECIA

Figure 5.4



Engineering

Current Projects

Cedar Cross Road - from Cedar Cross Ct to Starlight Dr. The project is programmed for FY 2012. The project will include 37' right of way, 12' vehicle lanes, 5' bike lanes, and outside green space with sidewalks.

Century Drive Reconstruction - Should be done within four years. The department would like to continue up Sylven Ln, but this is not currently in the budget.

The Southwest Arterial - project will also help east west traffic flow by pulling traffic off of the East West Corridor and Dodge St.

Future Projects

East West Corridor Plan - Install a series of three roundabouts. The roundabouts will keep traffic flowing. $100,000 for preliminary engineering in included in the CIP. The preliminary engineering will determine right of way and property purchase impacts of the project.

Cameras - installation of cameras at all roundabouts to monitor traffic.

US 52/61/151 Bridge - IA DOT is planning for reconstructing the bridge. City engineering is planning on running fiber south of Grandview Ave during the reconstruction.

Police

Current Projects

East-West Traffic - The primary concern fore safety in Zone 5 is east-west traffic flow. Primary east-west corridors become congested during peak hours which creates safety issues.

Future Projects

Stop light Coordination - Coordination was successful on Dodge St. and should be Continued on NW Arterial, JFK, and Pennsylvania.

Install fiber on all primary corridors.

Sheena Rd - When making left turns on to Asbury Rd. the driver's view is obstructed by cars parked on street. Engineering wanted to pull parking away from intersection, but apartment building has no off street parking.

Economic Development

Future Projects

University of Dubuque - is building a 400 room dormitory on the practice football field, and 1,000 seat performing arts center on the parking lot at McCormick and Bennett. This new development will increase vehicle, bicycle, and pedestrian traffic in the area.

Undeveloped farm land. (See Map)

City Health Services

Future Projects

Sidewalks on Wacker Dr. - Many people walk on Wacker Dr. to get from hotels south of US 20 to the mall area.

City Parks and Recreation

Future Projects

Schools - Middle School is a major pedestrian attractor. Improvement of pedestrian facilities in the area would greatly improve student safety.

Catfish Creek Trail - The plan is not adopted by the city or DMATS. The trail will be very expensive, but will provide an amenity to local residents.

The Jule Transit

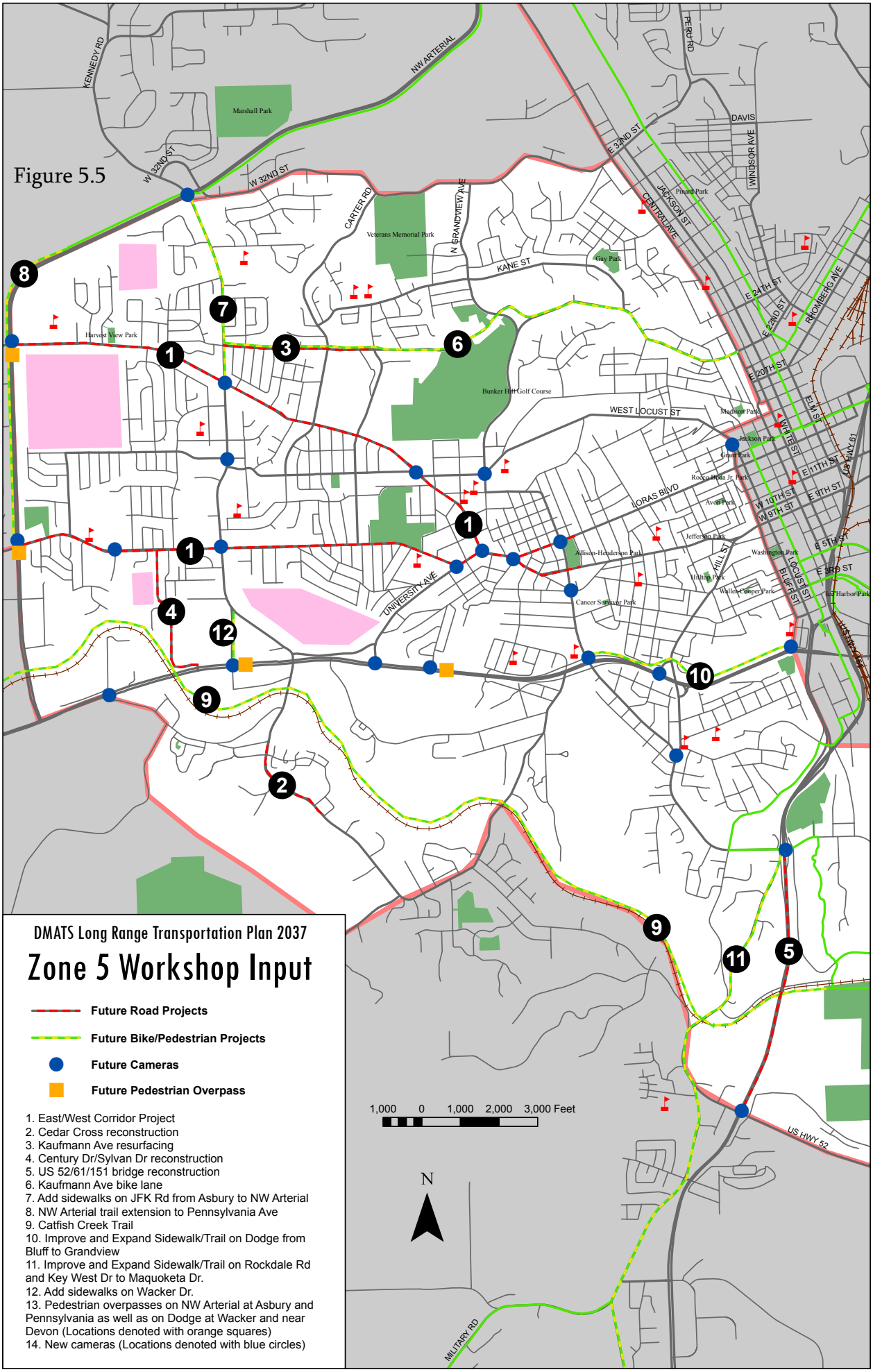
Current Projects

New Routes - The Jule has received funding for two new routes: The Medical Loop and The Shopping Loop.

Future Projects

Light Preemption - The Jule has requested the ability to preempt stoplights as a method for reducing idling time and reducing headways from 1 hour to 0.5 hour. Currently, only emergency vehicles are allowed to preempt traffic lights.

Figure 5.5



DMATS Long Range Transportation Plan 2037

Zone 5 Workshop Input

- **Future Road Projects**
- **Future Bike/Pedestrian Projects**
- **Future Cameras**
- **Future Pedestrian Overpass**

1. East/West Corridor Project
2. Cedar Cross reconstruction
3. Kaufmann Ave resurfacing
4. Century Dr/Sylvan Dr reconstruction
5. US 52/61/151 bridge reconstruction
6. Kaufmann Ave bike lane
7. Add sidewalks on JFK Rd from Asbury to NW Arterial
8. NW Arterial trail extension to Pennsylvania Ave
9. Catfish Creek Trail
10. Improve and Expand Sidewalk/Trail on Dodge from Bluff to Grandview
11. Improve and Expand Sidewalk/Trail on Rockdale Rd and Key West Dr to Maquoketa Dr.
12. Add sidewalks on Wacker Dr.
13. Pedestrian overpasses on NW Arterial at Asbury and Pennsylvania as well as on Dodge at Wacker and near Devon (Locations denoted with orange squares)
14. New cameras (Locations denoted with blue circles)

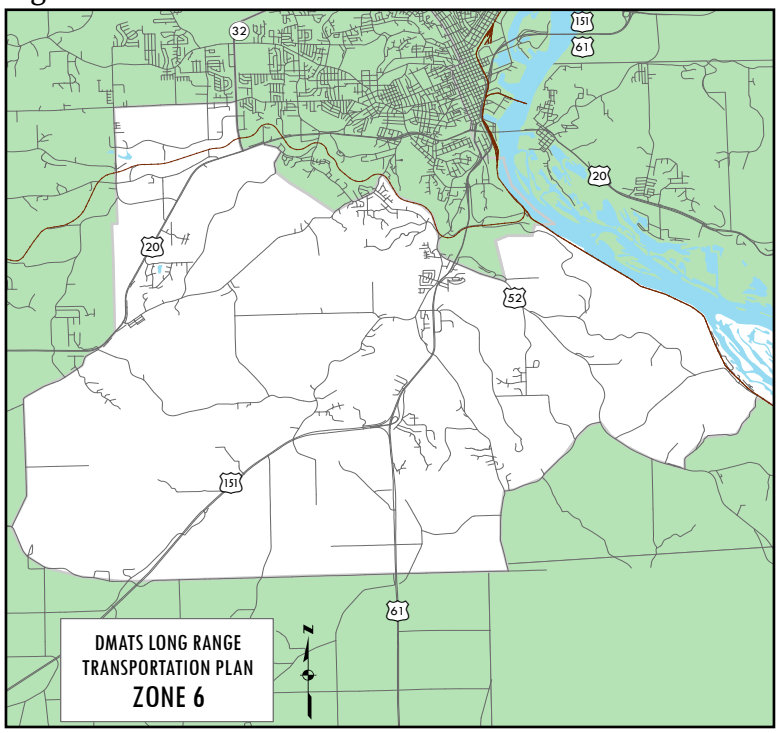
Meeting 3 - Zone 6

Zone 6 contains southern portion of the DMATS. The zone includes the southern portion of the City of Dubuque and unincorporated Dubuque County. It is bounded on the north by Middle Road, Fremont Avenue, and US 52, on the west by US 20 and Seippel Road, on the south by The DMATS boundary, and on the East by the Mississippi River.

Public Input Workshop 3 Table 5.3
Zone 6

Name	Department
Jon Dienst	Engineering
Dave Ness	Engineering
M R Corrigan	Health
Scott Crabill	Police
Kevin Klein	Police
Terry Tobin	Police
Todd Dalsing	Airport
Aaron DeJong	Economic Development
Kyle Kritz	City Planning
Jake Ironside	ECIA
Chandra Ravada	ECIA
Dan Fox	ECIA
Marie Ware	Parks and Rec

Figure 5.6



Engineering

Current Projects

SW Arterial.

N Cascade Rd - Reconstruction project between Edval Ln. and South Fork Catfish Creek bridge.

Signal improvement -Project funded by ICAPP, on US 151/61 at Twin Valley and Maquoketa Dr. intersections.

US 20 and N Cascade Rd. Interchange - is an ongoing DOT project that currently has no final design and no funding.

Future Projects

ITS - Eventually city will run fiber will south to SW Arterial, and possibly the Airport.

Cedar Cross Rd - Reconstruction project from US 20 to Cedar Cross Ct. The finished road will be 49 feet wide with bike lanes and a center turn lane.

Parks and Recreation

Current Projects

The Swiss Valley Nature Center - the park will be acquiring some additional acreage.

Future Projects

Parks - Would like to have one large park instead of several smaller parks to serve new development in the area.

Dubuque Technology Park Trail - The trail would encircle the employers located in the technology park.

Airport

Current Projects

New Terminal Construction - The project is expected to be completed by 2015.

Airport Access Road - The new road will be the primary access point to the airport from US 61. The road project is funded by a combination of FAA, local funds, and IA DOT funds.

Future Projects

Water and Sewer - The airport has had discussions with engineering about running utilities to the airport.

Future Development - The area around the airport is good for commercial development, but is not good for residential. The lack of city utilities has prevented commercial development in the area.

University of Dubuque - UD wants to use the existing terminal building for its training operations.

City Planning

Current Projects

Seipple Industrial Park - The industrial park at Old Highway Rd and Seipple Rd is going to bid for grading in 2011.

Key West - The City of Dubuque has no plans to annex Key West.

Future Projects

SW Arterial - Planning department is forecasting substantial residential development in the area as a result of the SW Arterial. Over the next 20 years, an estimated 4,000 units will be constructed.

Barrington Lakes - will possibly be annexed at some point in the future. The annexation will most likely be an 80/20. As part of the SW Arterial project, the US 20 access will be closed and a new access onto SW Arterial will be constructed.

Police

Current Projects

Cameras - Police cameras at Maquoketa and Twin Valley. and cameras on SW Arterial.

Future Projects

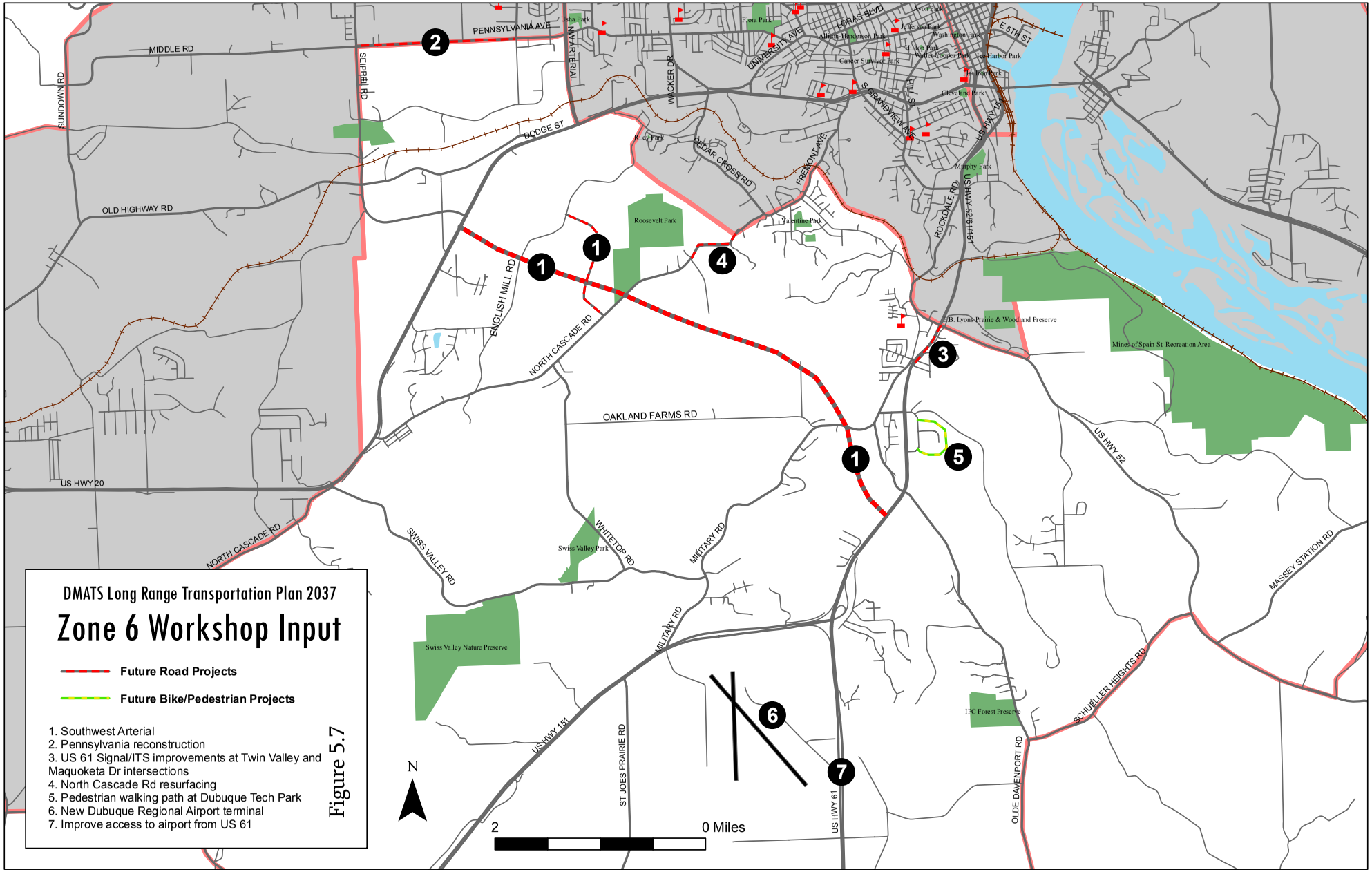
Safety - Table Mound One mobile home park in Key West is a law enforcement issue for the County Sheriff. The park could be and issue for City police if Key West is annexed into Dubuque.

City Health Services

Future Projects

Schools - New residential development in the area could create a capacity problem for the schools. Table Mound Elementary is the only school in Zone 6, and is already at capacity.

Rockdale Road - is in poor condition and needs to be rebuilt. The road needs to be updated for bicycle and pedestrian use.


DMATS Long Range Transportation Plan 2037
Zone 6 Workshop Input
Future Road Projects
Future Bike/Pedestrian Projects
1. Southwest Arterial
2. Pennsylvania reconstruction
3. US 61 Signal/ITS improvements at Twin Valley and Maquoketa Dr intersections
4. North Cascade Rd resurfacing
5. Pedestrian walking path at Dubuque Tech Park
6. New Dubuque Regional Airport terminal
7. Improve access to airport from US 61
Figure 5.7
N
2
0 Miles
MIDDLE RD
PENNSYLVANIA AVE
SUNDOWN RD
SEIPPEL RD
NW ARTERIAL
WACKER DR
UNIVERSITY AVE
LORAS BLVD
E 5TH ST
S GRANDVIEW AVE
BODGE ST
CEDAR CROSS RD
FREMONT AVE
ROCKDALE RD
OLD HIGHWAY RD
ENGLISH MILL RD
NORTH CASCADE RD
OAKLAND FARMS RD
US HWY 20
SWISS VALLEY RD
WHITETOP RD
MILITARY RD
US HWY 151
ST JOES PRAIRIE RD
US HWY 61
US HWY 52
MASSEY STATION RD
SCHUELLER HEIGHTS RD
OLDE DAVENPORT RD
Roosevelt Park
Valentine Park
Murphy Park
Cleveland Park
Riley Park
Swiss Valley Park
Swiss Valley Nature Preserve
E.B. Lyons Prairie & Woodland Preserve
Mines of Spain St. Recreation Area
IPC Forest Preserve

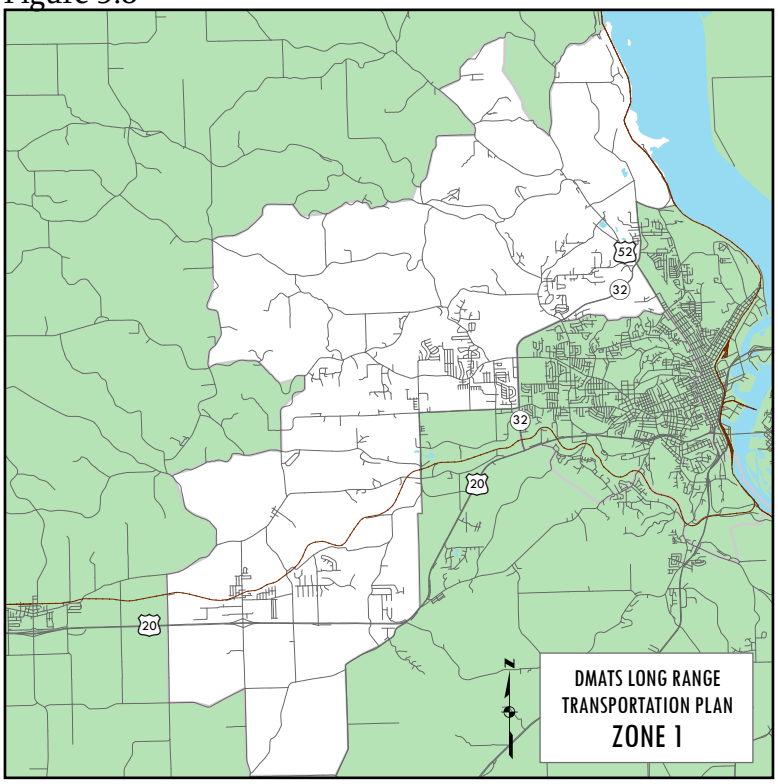
Meeting 4 - Zone 1

Zone 1 contains the northwestern portion of the DMATS area. The Zone includes the northwestern portion of the City of Dubuque, the City of Asbury, the City of Peosta, the City of Sageville, and unincorporated Dubuque County. It is bounded on the west by the DMATS boundary, on the northeast by the Mississippi River, and on the southeast by North Cascade Road, Pennsylvania Ave, NW Arterial, and E 32nd St.

Table 5.4
Public Input Workshop 4
Zone 1

Name	Department
Jon Dienst	Engineering
Beth Bonz	City of Asbury
Greg Egan	County Sheriff's Dpt.
Bret Winlinson	County Engineer
Kevin Klein	Police
Terry Tobin	Police
Anna O'Shea	County Zoning
Aaron DeJong	Economic Development
Kyle Kritz	City Planning
Mark Ludescher	Dubuque Fire Dpt.
Dan Fox	ECIA

Figure 5.8



City Engineering

Current Projects

ITS – Fiber has been run along Chavenalle Rd. The city will eventually run fiber conduit as part of the Middle Road reconstruction project.

Future Projects

Pennsylvania Road - Reconstruction project from Seipple Road to Radford Road. The City has conducted some preliminary engineering for the project, and have looked at some of the potential property impacts. Project costs will be high will be high because of topography . Grading on the north section of Industrial Center West that abuts Pennsylvania was left unfinished to allow for the future improvement of Pennsylvania.

Dubuque City Planning

Current Projects

Daisy Hill Development - Preliminary plat has been filed and roads are under construction.

Future Projects

Derby Grange Road Development -Teh area will see some development in the future. City of Dubuque has installed sanitary sewer in the area that is currently not in use.
Development South of Pennsylvania Ave - Developer has proposed a 300 unit residential subdivision for the area. No final plats have been submitted.

County Engineer

Current Projects

Derby Grange Road Bridge - needs to be repaired. There is currently a 3 ton weight limit on the bridge, which causes issues for the Asbury Fire Department. Dubuque County is aware of the problem and is trying to get it done next year, but project have not been completed.

Hwy 52 Trail Bridge - County conservation is managing the project. Three design projects have been submitted. The project is being let in January 2010 or February 2011.

Future Projects

The County's three main priorities for road construction are : CR Y13, Mud Lake Rd, and Asbury Rd.

Mud Lake Road - The project will be a major reconstruction. Grade and pave.

Asbury Rd - Plans are for reconstruction starting at the city limits and heading west. Hope to start grading sometime next year.

Hales Mill Rd - At this time the county does not have a specific plan for Hales Mill Road.

Sageville Road – County receives complaints about the road, but no projects are currently planned.

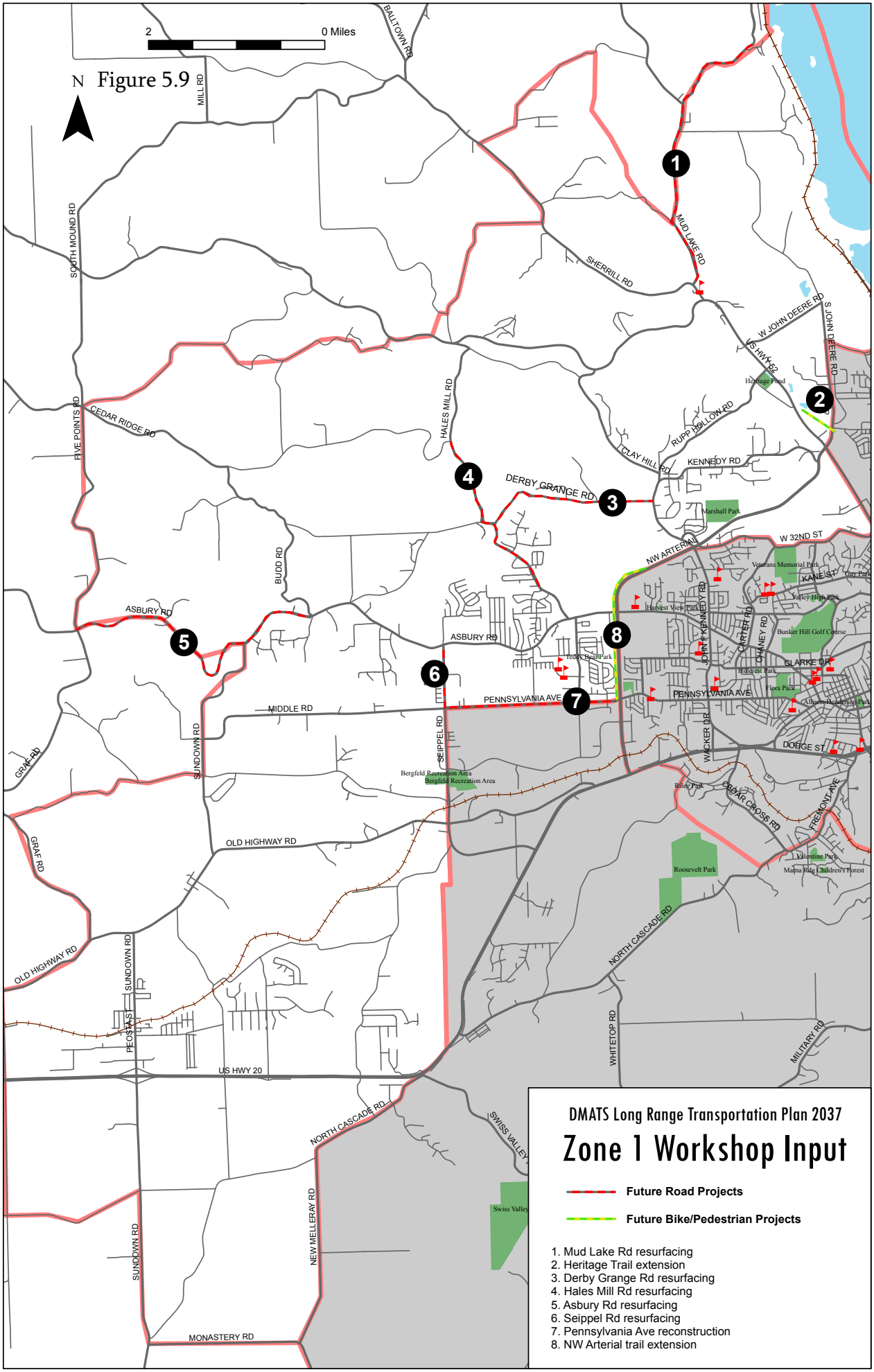
City of Asbury

Future Projects

Seipple Road - Reconstruction project from Middle Road to Asbury Road. The roadway will be widened to 37' with storm water improvements.

Hales Mill Road - Project has been discussed in the past as a joint project between Asbury and Dubuque County.

Trails - City of Asbury is looking to connect Asbury Parks and Maple Hills park with a trail.


2
0 Miles
N
Figure 5.9
MILL RD
BALLTOWN RD
SOUTH MOUND RD
FIVE POINTS RD
CEDAR RIDGE RD
MUD LAKE RD
SHERRILL RD
W JOHN DEERE RD
S JOHN DEERE RD
US HWY 52
Heritage Pond
HALES MILL RD
CLAY HILL RD
RUPP HOLLOW RD
KENNEDY RD
DERBY GRANGE RD
Marshall Park
W 32ND ST
NW ARTERIAL
Veterans Memorial Park
KANE ST
Valley High Park
Harvest View Park
JOHN F KENNEDY RD
CARTER RD
CHANEY RD
Bunker Hill Golf Course
CLARKE DR
Hillcrest Park
Flora Park
PENNSYLVANIA AVE
Allison Hedges Park
BUDD RD
ASBURY RD
Teddy Bear Park
MIDDLE RD
SEIPPEL RD
WACKER DR
DODGE ST
Bergfeld Recreation Area
Riley Park
CEDAR CROSS RD
FREMONT AVE
GRAF RD
SUNDOWN RD
OLD HIGHWAY RD
Roosevelt Park
Valentine Park
Mama Ridge Children's Forest
NORTH CASCADE RD
PEOSTA ST
US HWY 20
WHITETOP RD
MILITARY RD
SWISS VALLEY
Swiss Valley
NEW MELLERAY RD
MONASTERY RD
1
2
3
4
5
6
7
8
DMATS Long Range Transportation Plan 2037
Zone 1 Workshop Input
Future Road Projects
Future Bike/Pedestrian Projects
1. Mud Lake Rd resurfacing
2. Heritage Trail extension
3. Derby Grange Rd resurfacing
4. Hales Mill Rd resurfacing
5. Asbury Rd resurfacing
6. Seippel Rd resurfacing
7. Pennsylvania Ave reconstruction
8. NW Arterial trail extension

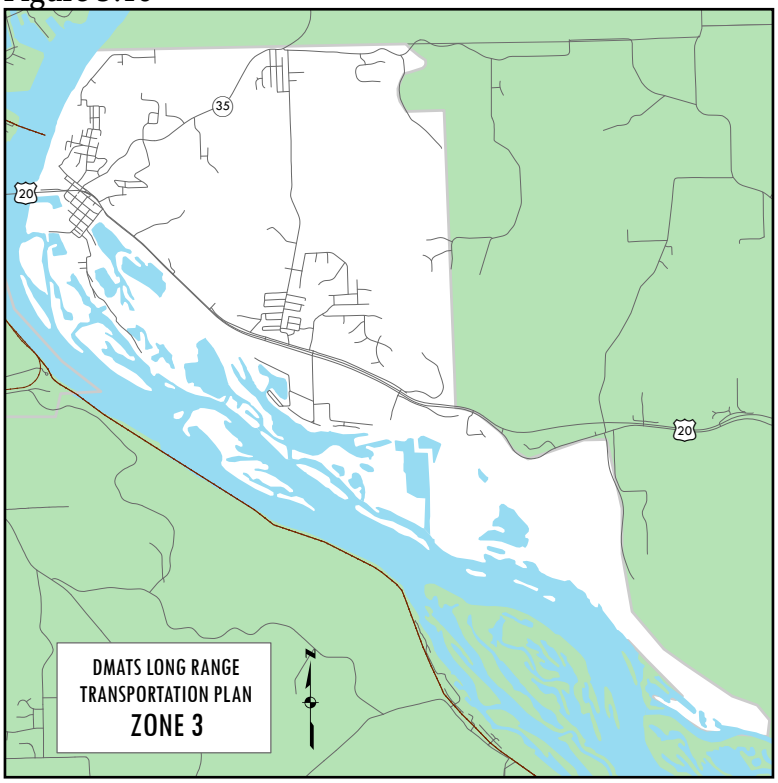
Meeting 5 - Zone 3

Zone 3 contains Illinois portion of the DMATS area. The zone includes the City of East Dubuque, Illinois and a portion of unincorporated Jo Daviess County, Illinois. It is bounded on the west by the Mississippi River, on the north by the Wisconsin state border, and on the south and east by the DMATS boundary.

DMATS Staff met with East Dubuque City Manager Geoff Barklow on February 23,2011 at East Dubuque City Hall to discuss current and future projects.

East Dubuque's primary focus over the next 30 years will be encouraging development south of US Hwy 20. Rail lines and limited land access have prevented economic development from occurring in this area in the past. The City plans encourage development by eliminating barriers to development and creating incentives to attract new development.

Figure 5.10



Current Projects

TIF District - East Dubuque is in the process of establishing a TIF district between US Hwy 20 and the river. (see map)

2nd St. and Wall St. Intersection - Pavement at this intersection was damaged by a water main break. The city may be using federal funds for street repairs. Repair costs are estimated at approximately $20,000.

Future Projects

Property Access South of US Hwy 20 -

- Rail overpass Frentess Lake Rd
- New road to provide direct access to US 20 between Tomahawk Ln and Badger Rd

State Hwy 35 - East Dubuque has several road projects along Hwy 35

- Cherry St Extension - The extension of Cherry St to Hwy 35 would open more land for development.
- Parklane Dr - Stoplight at intersection with Hwy 35 to control traffic from high school.
- Parklane Dr - Extend Parklane Dr north of Hwy 35 to open land for development.

Storm Sewer and flood gate repair.

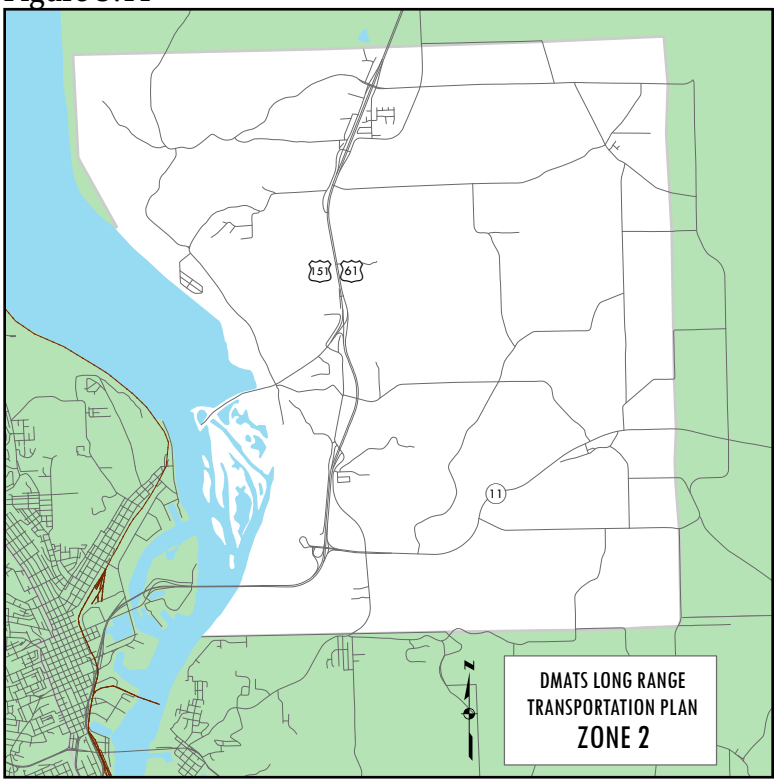
Passenger Rail - East Dubuque would be open to the construction of a passenger rail terminal in town.

Four-lane US Hwy 20 Bridge - DOT estimates that the Julian Dubuque Bridge expansion project will begin in 2019 or 2020.

Meeting 6 - Zone 2

Zone 2 contains Wisconsin portion of the DMATS area. The zone includes the Jamestown Township and a several unincorporated communities. It is bounded on the west by the Mississippi River, on the south by the Illinois state border, and on the north and east by the Jamestown Township boundary.

Figure 5.11



DMATS staff met with Platteville City Manager Larry Bierke and Southwestern Wisconsin Regional Planning Commission Planning Manager Amy Seeboth on in Platteville March 22, 2011.

The City of Platteville, Wisconsin is not included in the DMATS area, however there is a demand for transportation between Platteville and Dubuque. This demand is expected to increase when rail service is established between Dubuque and Chicago.

At some point in the future, Platteville would liek to partner with DMATS to conduct a study on the feasibility of operating transit service between Dubuque and Platteville.

Transit Action Group Meeting

DMATS staff met with members of the Transit Action Group (TAG) on February 15th, 2011. At the workshop participants were asked to develop and prioritize a list of projects for the LRTP. Infrastructure projects were not addressed at this meeting because they were included in the *Tri-State Integrated Walking, Bicycling, Hiking Network Plan*. Input on bike and pedestrian projects was also collected during the Safe Routes to School Planning process. The Dubuque Area Safe Routes to School Plan contains input on infrastructure and non-infrastructure projects.

The TAG identified the following projects as the top three priorities for transit in the DMATS area.

1. Passenger Rail from Chicago to Dubuque
2. Intermodal Facility
3. Transfer station at ARC

Bike and Pedestrian Meeting

DMATS staff met with members of the Tri-State Trail Vision committee on December 16th, 2010. At the workshop participants were asked to develop and prioritize a list of non-infrastructure projects. Infrastructure projects were not addressed at this meeting because they were included in the *Tri-State Integrated Walking, Bicycling, Hiking Network Plan*. Input on bike and pedestrian projects was also collected during the Safe Routes to School Planning process. The Dubuque Area Safe Routes to School Plan contains input on infrastructure and non-infrastructure projects.

Table 5.5

Name	Organization
Ron Bensink	Tri-State Trail Vision
Bob Schiesl	City of Dubuque Engineering
Marie Ware	Parks and Rec
Jim Giesen	
Judy Giesen	
Dianne Koch	Tri-State Trail Vision
Jim Gonyier	Tri-State Trail Vision
Parrish Margg	Tri-State Trail Vision
Tony Zelinskas	Tri-State Trail Vision
Chandra Ravada	ECIA
Dan Fox	ECIA

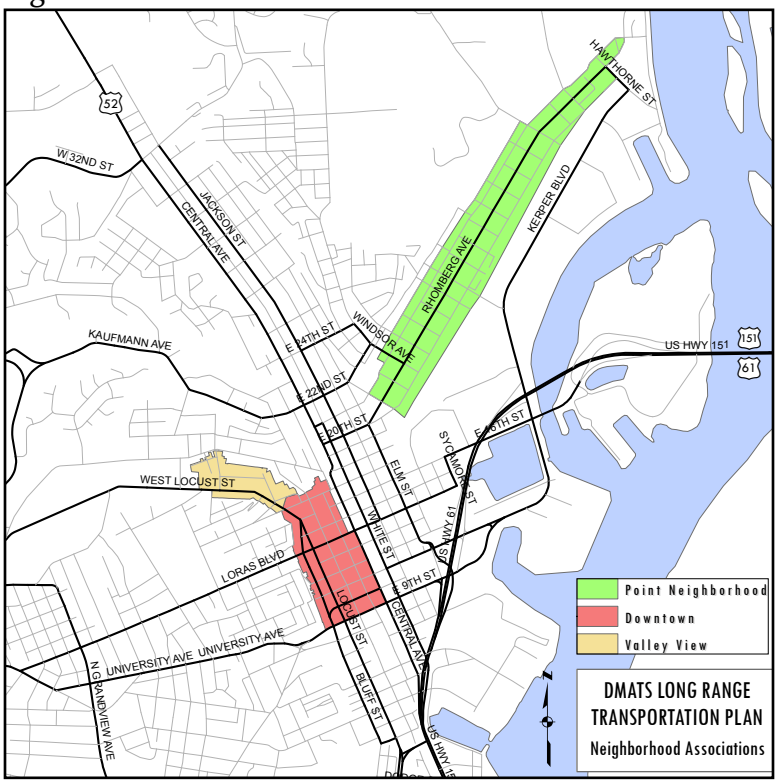
Non-Infrastructure Project Priorities

1. Maintain existing projects including: Pedal Project, Bike-to-Work Week, and Safe Routes to School
2. General education concerning helmet use and the rules of the road.
3. Increase the number of trail map kiosks.
4. Education on roundabout etiquette for drivers, walkers, and bicyclists.
5. Increase the number of bike racks throughout the city, especially around city buildings.
6. Trail Vision members give educational presentations at other community group meetings. Presentations would educate the general population and build a larger support base for TSTV.
7. Provide locked bike storage during work hours.
8. Develop public service announcements.
9. Continuation of Finley's Bike Rodeo
10. Develop a marketing plan
11. Combine bike safety and riding opportunities with school Wellness/Physical Education programs, e.g., a trailer with 30 bikes, cones, helmets, etc. that travels from school to school.
12. Encourage employers to provide shower facilities.
13. Develop videos on how to ride/share the road. Videos could be aired on Community Access channel, and social media sites. Videos could be produced with help from Iowa DOT, Dubuque bike police, Gary Olson with public schools, or Dubuque's college communication programs.
14. Develop private business opportunities at destination points to encourage trail use, e.g., selling of food, pop, ice cream, etc.
15. Develop bike rental programs for colleges and business. Similar to program in Minneapolis-St. Paul
16. Develop trilingual trail signage.

Neighborhood Association Meetings

DMATS staff sought input from Dubuque's neighborhood associations. Out of the eleven associations, three agreed to allow DMTATS staff to come speak and gather input at their monthly meeting. The three neighborhood associations were The Point Neighborhood Association, Valley View Neighborhood Association, and the Downtown Neighborhood Association.

Figure 5.12



During the neighborhood association meetings, members expressed concerns on a variety of transportation topics.

Transit - No one at the Valley View meeting rides The Jule on a regular basis. Reasons for not riding the bus included: long wait times, long travel times, and the convenience of driving a car.

Several of those attending the Point Association meeting did ride the bus on a regular basis, but expressed concerns about the transit similar to those expressed at the Valley View meeting.

Members of the Downtown Association noted that the Jule does not run when they need it, e.g. second and third shifts, and on weekends.

Services for Children - Downtown members commented positively on the Jule's "Freeway to Fun City" program, which gives kids free rides to the pool and library during summer months, and the program that allows students to ride the bus for free. Downtown residents expressed concern about the high cost of charter bus service for school children. Currently, federal charter service regulations prevent transit systems from providing charter services.

Services for the elderly - Minibus and DuRide provide good service to elderly residents, but the application process can be difficult for some.

Public meeting notices - Government should provide meeting notices in a variety of media. Many residents do not get the Telegraph Herald newspaper. Examples: online, The Dubuque Advertiser, Social Networks, radio, and television.

Roundabouts - Attendees at the Valley View and Downtown meetings expressed concerns about the safety and functionality of the roundabouts proposed as part of the SW Arterial project and the East West Corridor Study. Many thought that the city should provide education on the use of roundabouts in advance of their installation.

Environment - Environmental impact of transportation was a topic of discussion at several meetings. Many felt that environmental quality should be a considered in transportation projects.

Airport - Downtown residents would like to see flights to cities other than Chicago.

SAFETEA-LU expanded the number of planning factors from seven to eight by splitting safety and security into separate factors. Before SAFETEA-LU, the factor for safety and security read, "increase the safety and security of the transportation system for motorized and nonmotorized users." Under SAFETEA-LU, the factor now read, "Increase the safety of the transportation system for motorized and non-motorized users", and "increase the security of the transportation system for motorized and non-motorized users." The goal behind this change was to emphasize the importance of safety, and to acknowledge the special concerns regarding security in the wake of the events of September 11, 2001.

In the past, discussions of safety and security were woven into the modal chapters (highway, transit, pedestrian, bicycle, freight and aviation) of the LRTP. The 2040 LRTP consolidates the safety and security components into this chapter.

Safety

In recent years, the United States has seen significant reductions in motor vehicle-related deaths. The U.S. Department of Transportation announced in a press release in March 2010 that the number of overall traffic fatalities reported at the end of 2009 reached the lowest level since 1954, declining for the 15th consecutive quarter. The fatality data for 2009 placed the highway death count at 33,963 — a drop of 8.9 percent — compared to the 37,261 deaths reported in 2008. Safety analysts attribute this success to a number of factors, including increased seatbelt use and fewer alcohol-related crashes. High fuel prices and poor economic conditions have also lead to a downturn in the number of vehicle miles traveled. According to early projections, the fatality rate, which takes into account the number of miles traveled, reached the lowest level ever recorded.

Evaluation of Transportation Safety Data

The primary source for transportation safety data is the crash report that a law enforcement officer fills out at the scene of an accident. The crash report is a valuable tool that summarizes the details of a crash including contributing factors or driver behaviors that caused the crash, location of the incident, driver characteristics, vehicle characteristics, and other information needed to analyze transportation safety. The data is important in identifying high-crash locations, issues that may require public education, and specific demographics prone to collisions. For this analysis, DMATS used crash data from the Iowa portion of the area. The Iowa Traffic Safety Department collects and distributes the crash data for use by local public safety agencies.

Figure 6.1

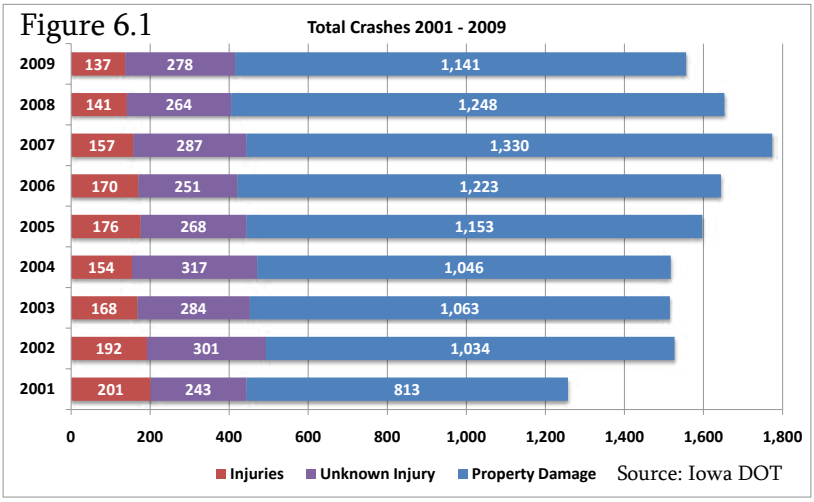
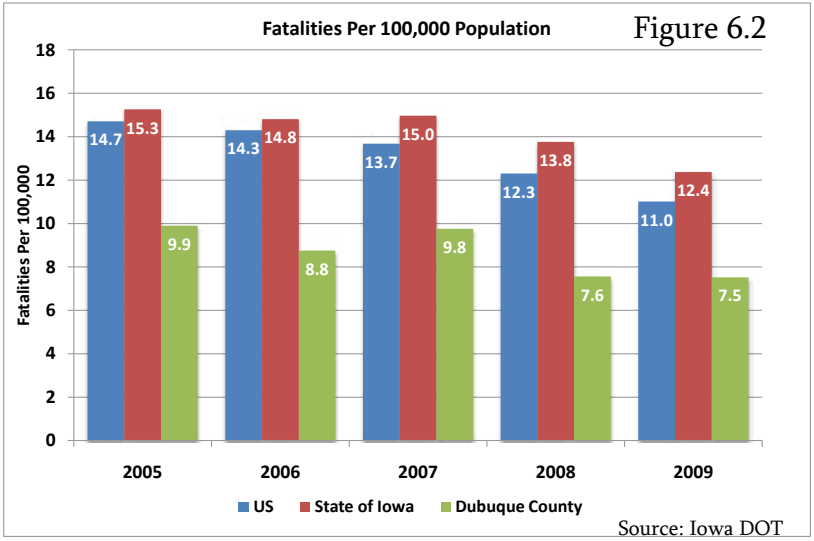
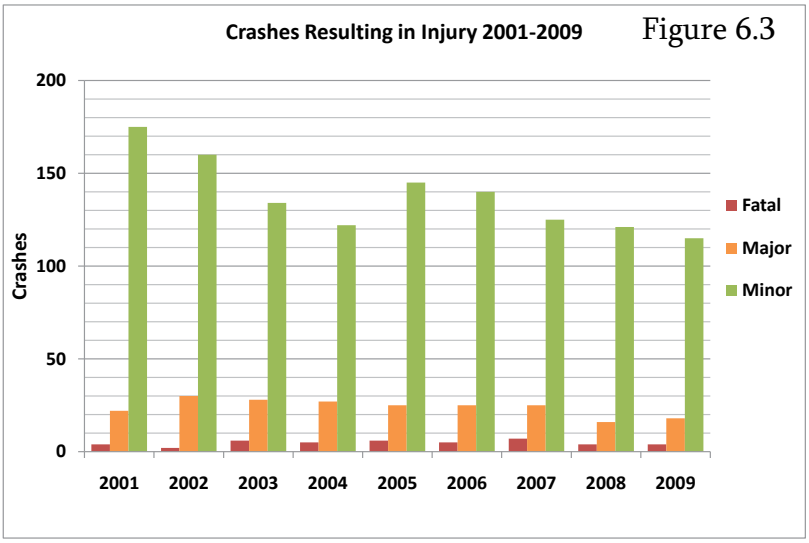


Figure 6.2



Source: Iowa DOT

Figure 6.3



Source: Iowa DOT

The crash analysis examines vehicle and pedestrian crashes in the DMATS region. Over the last nine years, the region averaged approximately 1,560 crashes per year. There was a spike in crashes in 2007, but the region showed a decline in accident rates in recent years. The DMATS region's accident rate is below the national and state accident rate.

In the DMATS region between 2001 and 2009, motor vehicle crashes resulted in 43 fatalities, 216 major injuries, and 1,237 minor injuries. Over the decade, the region averaged approximately 4 deaths, 22 major injuries, and 124 minor injuries per year. See Figure 6.1.

DMATS uses the nationally accepted performance measure of fatalities per 100,000 population. See Figure 6.2. In 2009, the DMATS fatality rate of 7.52 was substantially lower than the state and national rates of 12.37 and 11.01 respectively. In fact, over the past five years, fatality rates in the DMATS area have been consistently lower than state and national rates. See Figure 6.3. Despite below average fatality rates, local decision makers have recognized that an annual average of 1,560 accidents is too high and have elevated the importance of transportation safety within regional transportation policy.

Current Transportation Safety Efforts

Dubuque Multi-Disciplinary Safety Team

Collaboration is critical to the implementation of a safe and efficient transportation system. Time, money and personnel are limited, and public safety agencies need to work together to eliminate duplication of services, and ensure that response efforts have the greatest impact on the region's transportation safety problems. In 2002, the Dubuque County public safety agencies came together to form a Multi –Disciplinary Safety Team (MDST). The MDST has undertaken a variety of strategies to improve DMATS transportation safety.

It is the goal of the Dubuque County MDST to Cooperate, Collaborate, and Cooperate with other agencies to improve safety in the region. The four areas the group focus on to improve safety are Education, Engineering, Enforcement, and Emergency Services.

Education

Education involves informing users about unsafe behaviors and suggesting ways to improve safety when they use the transportation system. Police, fire, and engineering departments across the region use education as a transportation safety tool.

Engineering

Local public works departments or state departments of transportation often implement engineering strategies to improve roadway safety. In most cases, infrastructure solutions are low-cost, reactionary improvements that focus on crash hot spots or corridors. However, engineers and planners are beginning to use a proactive approach to improve transportation safety. Under this approach, small safety improvements are implemented in the planning stages of a project. This proactive method takes a system wide approach to addressing transportation safety issues that will prevent accidents through incremental changes on a corridor level. A good safety plan will include a balance of reactionary and proactive improvements.

Enforcement

Law enforcement officers play a valuable role in maintaining the region's transportation safety and security. Their presence can encourage appropriate driving behaviors, prevent motor vehicle collisions, and deter criminal acts. Enforcement officers also are the source of most transportation safety data — typically crash data. In addition, these individuals must coordinate traffic flow around incidents that may create congestion and motorist delays along the region's roadways.

Emergency Services

Emergency services personnel help prevent additional deaths and injuries from occurring after an initial incident. This professional sector includes emergency medical services paramedics, first responders, trauma room nurses, and doctors. Other services such as motorist assist, which helps drivers with vehicle problems contribute to transportation safety by limiting the length of time vehicles are stopped on the highway. Their efforts, in coordination with regional transportation management systems, help prevent traffic delays and secondary crashes.

Policy Framework Goals and Supporting Strategies

DMATS will examine, evaluate, and implement the regional strategies contained in the Iowa Comprehensive Highway Safety Plan (CHSP). The CHSP addresses highway-safety priorities and issues monitored by the State Safe Committee. In addition, appropriate actions will be taken to support the transportation system goals identified in CHSP. The Iowa, Illinois, and Wisconsin DOTs' instructed DMATS to use the Iowa CHSP f the LRTP, because the majority of the area's population lives in Iowa.

Top Five Safety Policy Strategies (Legislative) from CHSP

Young drivers - Strengthen minor school license (MSL) and graduated driver's license (GDL) laws with stronger provisions that are proven to reduce specific risks and save lives.

Performance measures:

- The passage of enhanced graduated driver's license (GDL) legislation
- Decrease the percent of all fatal and serious crashes involving young drivers in Iowa

Occupant protection - Require occupant restraints in all automotive vehicle seating positions.

Performance measures:

- The passage of all positions safety belt law
- Increase statewide safety belt use rate
- Decrease the percent of fatal and serious injury crashes in which safety belts were not used

Motorcycle safety - Restore a motorcycle helmet law.

Performance measures:

- The passage of an Iowa helmet law
- Statewide helmet use rate
- The number of fatal and serious injury crashes among motorcycle riders in Iowa
- The percent of fatal and serious injury motorcycle crashes in which a helmet was not used

Traffic safety enforcement - Support traffic safety enforcement and adjudication with adequate resources.

Performance measures:

- Increased funding and staffing for state and local law enforcement
- Decrease the number of fatal and serious injury crashes involving impaired-driving
- Decrease the involvement of 18- to 24-year-old drivers as a percent of all drinking drivers in fatal and serious injury crashes
- Decrease the number of fatal and serious injury crashes involving impaired motorcycle operators

Traffic Safety Improvement Program – Increase Iowa Traffic Safety Improvement Program funding from .5 percent to a full 1 percent of Iowa's Road Use Tax Fund.

Performance measures:

- The passage of legislation increasing program funding from .5 percent to 1 percent of Iowa's Road Use Tax Fund
- Decrease the fatal and serious injury rates at program sites

Top Eight Safety Program Strategies (Administrative) from CHSP

Lane Departure - Enhance state and local lane departure-related design standards and policies including: paved shoulders, centerline and shoulder rumble strips, pavement markings, signs, and median barriers.

Performance measures:

- Decrease the number of fatal and serious injury lane departure crashes by system type and surface type roads in Iowa.
- Decrease the number of lane-departure crashes as a percentage of all crashes.

Safety Corridors - Identify safety corridors and use multidisciplinary strategies to mitigate specific crash causes such as impairment, speeding and driver inattention.

Performance measures:

- The successful development of a safety corridor program.
- Targeted before and after results on the program corridors.

Intersections - Promote innovative intersection designs such as roundabouts and other new configurations

Performance measures:

- Decrease the number of fatal and serious injury crashes at intersections that have higher than the state average crash rates.
- Decrease the fatal and serious injury crashes at intersections on urban local roads.
- Decrease the severity of crashes at intersections.

Local Roads - Create local multidisciplinary safety teams (MDSTs) to identify and resolve local crash causes and enhance crash response practices

Performance measures:

- The number of local roads teams developed within Iowa.
- Decrease the number of fatal and serious injury crashes on Iowa's low-volume local roads (less than 400 vehicles per day).

Crash Data Records - Enhance data availability and use by all stakeholders

Performance measures:

- Data availability and its use by all stakeholders.

Senior Mobility - Develop a single point of contact to help older persons and their caregivers navigate existing programs regarding changing mobility needs.

Performance measures:

- Successful creation of a single point of contact to help older persons and their caregivers navigate existing programs regarding changing mobility needs.

Safety Training and Education - Provide state and local multidisciplinary traffic safety education programs for professionals and the driving public.

Performance measures:

- The development and delivery of safety practitioner training.
- The development and delivery of public education and information efforts.

Unpaved Rural Roads - Promote public awareness of the risks of driving on unpaved rural roads.

- Decrease the number of fatal and serious injury crashes on Iowa's unpaved local roads.
- The development and delivery of a public awareness program on the risks of driving on unpaved rural roads.

Security

Transportation and personal security have received greater attention across the country since the terrorist attacks in New York City in 2001. The hurricane and resulting flooding along the Gulf Coast in 2005 demonstrated the importance of transportation facilities and services in an emergency event. Transportation facilities and systems are critical to maintaining the region's economy and everyday quality of life, and responding to natural and manmade disasters.

In 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was signed into law and continued many of the programs established in previous transportation bills. SAFETEA-LU reflects the renewed interest in security issues with transportation infrastructure. It identifies security as a stand-alone planning factor, signaling an increase in importance from prior legislation.

Overview

Dubuque County Emergency Management maintains a forum that engages the region's fire protection, law enforcement, emergency medical services, public health, emergency management, public works, and emergency communications agencies. Through preparedness planning efforts, evacuation and incident management plans have been adopted. The plans guide the work of the coordinating committee and other groups in the evaluation risks and identification actions and investments to reduce them or increase response capabilities.

The region's evacuation plan and incident management plan incorporates these most probable risks.

Evacuation plan

The evacuation outlines a procedure for the movement of people from an at risk area to a safe area during an emergency. The Strategic Highway Network provides access, continuity, and reliability during emergency conditions. In the DMATS Region, US Hwy 20, US Hwy 52, and US Hwy 61/151 are the major highways that connect to urban and rural areas and provide commerce routes into State of Illinois and Wisconsin. DMATS highways are designated for use in times of evacuations and other emergencies. The system should be protected from any attacks, as this is the lifeline for the region.

In the event of an emergency the transit system will be used to transport evacuees out of the at risk area. Most people will provide their own transportation during a mass evacuation, however if transportation is needed, requests must be made early in the incident for county resources to provide buses or other forms of transportation. The evacuation plan describes the provisions that have been made to ensure the safe and orderly evacuation of a portion of the population threatened by an emergency. The Evacuation Plan includes the following:

- Natural and man-made hazards that communities are vulnerable to based development patters and the geographical location of the community.
- Critical planning efforts that need to be addressed prior to a potential natural or man-made disaster.
- Preparedness measures that local officials should implement to prepare for a local or regional emergency.
- Responsibilities of law enforcement, fire protection, medical, and first responder personnel.
- Definition of the means in which public agencies and service organizations will interact during an emergency.
- Training activities that should take place to assure public agencies and service organizations are prepared for an emergency situation.
- Evacuation planning also applies to terrorism preparedness and natural hazards. Mass evacuation planning supports preparedness for terrorist caused events, and other types of catastrophic events.

Evacuation Plan Maps

A detailed planning effort prior to an event that necessitates an evacuation will minimize the effect of the disaster upon the residents of the city, and reduce the loss of life and personal property. Emergency personnel within the Dubuque Metropolitan Area recognize that a successful evacuation, particularly an evacuation of a large portion of the population, encompasses more than physically moving a population from the area at risk to a safe area. The effectiveness of evacuation planning hinges on the adequacy of other functions of emergency management, such as direction and control, communications, warning, emergency public information, providing for health and medical needs, mass care, and resource management. Shortcomings in each of these areas could undermine the ability complete an evacuation, particularly large-scale evacuations that involve movement of a large portion of the population. The maps at the end of the chapter provide information that will help coordinate a successful evacuation

Figure 6.4 **Evacuation District Boundaries**

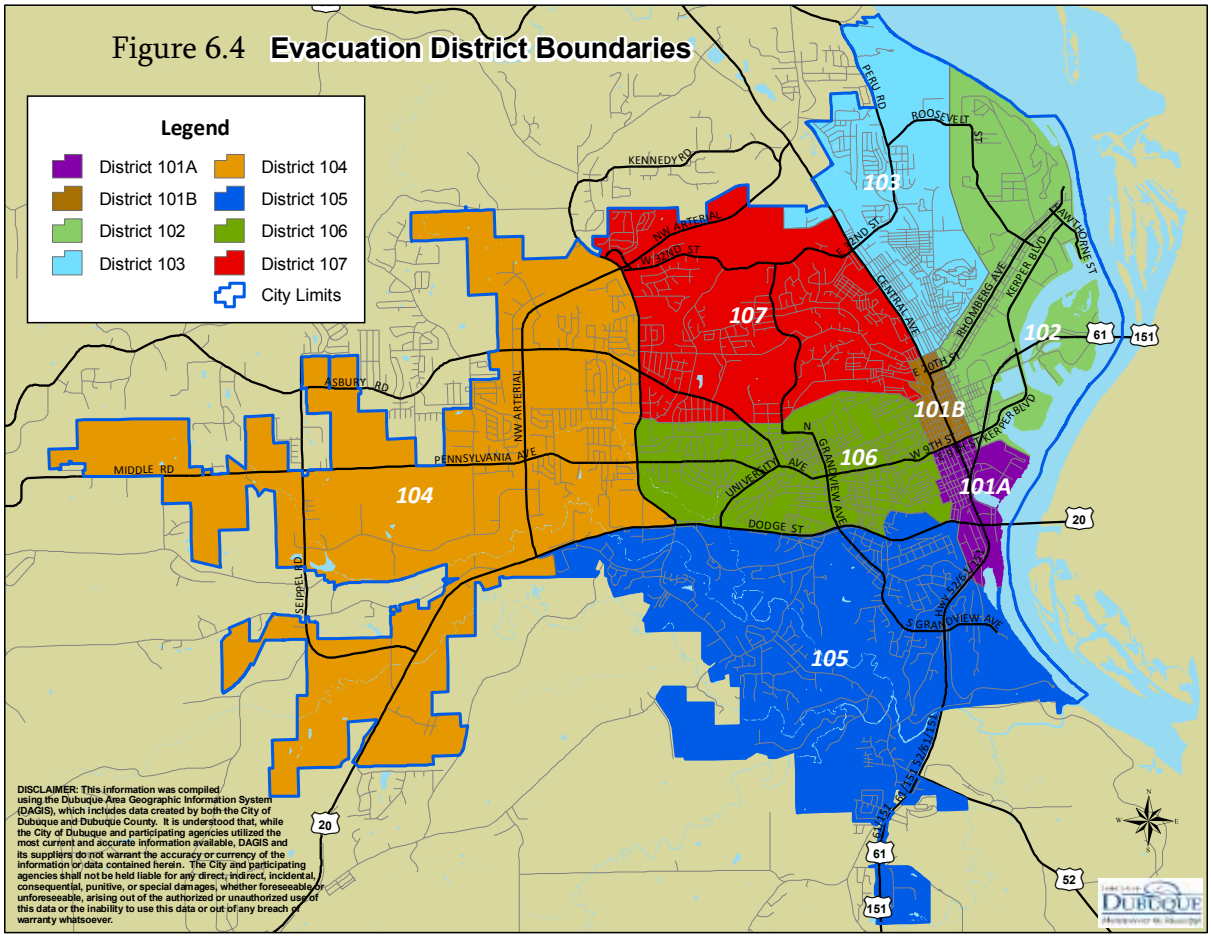


Figure 6.5 **Potential Evacuation Routes**

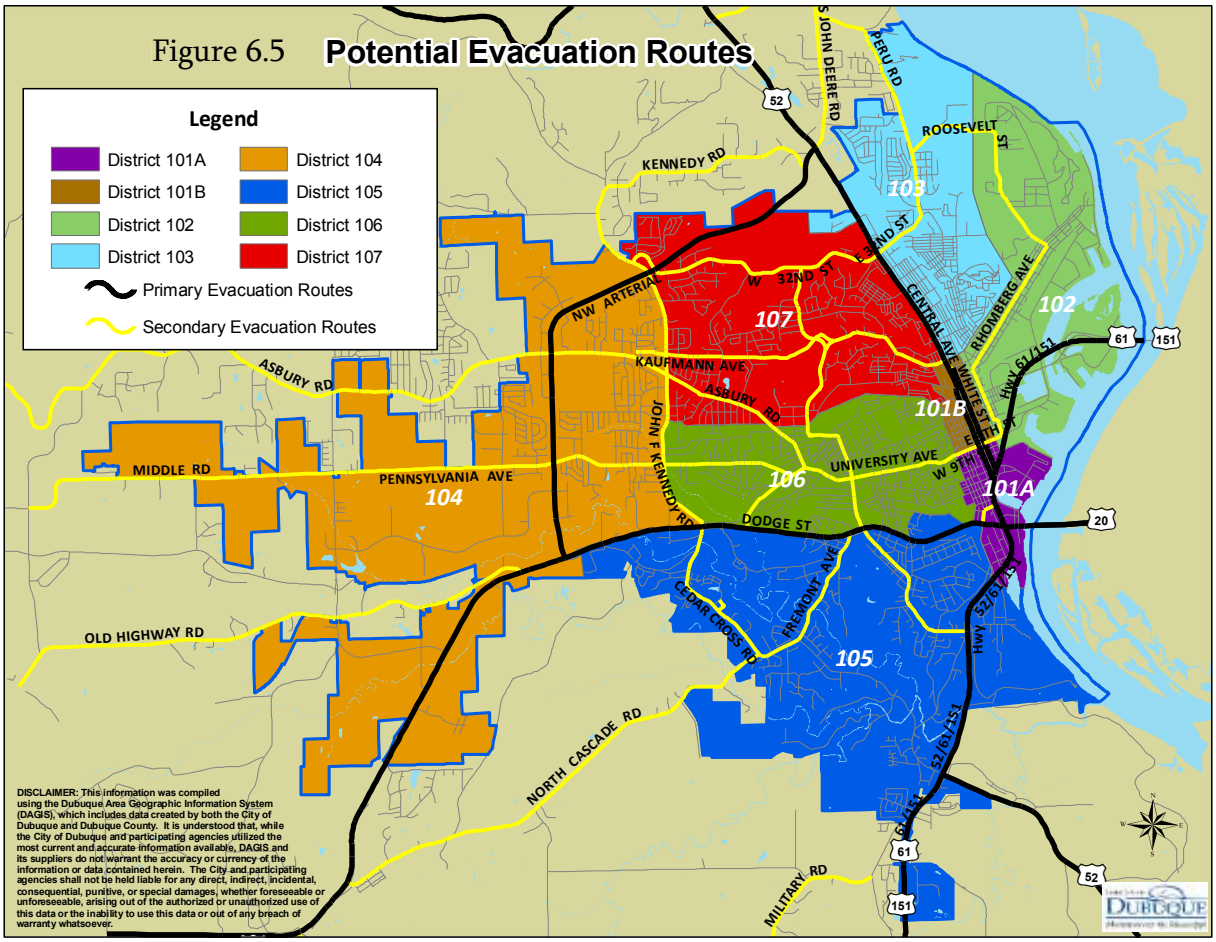
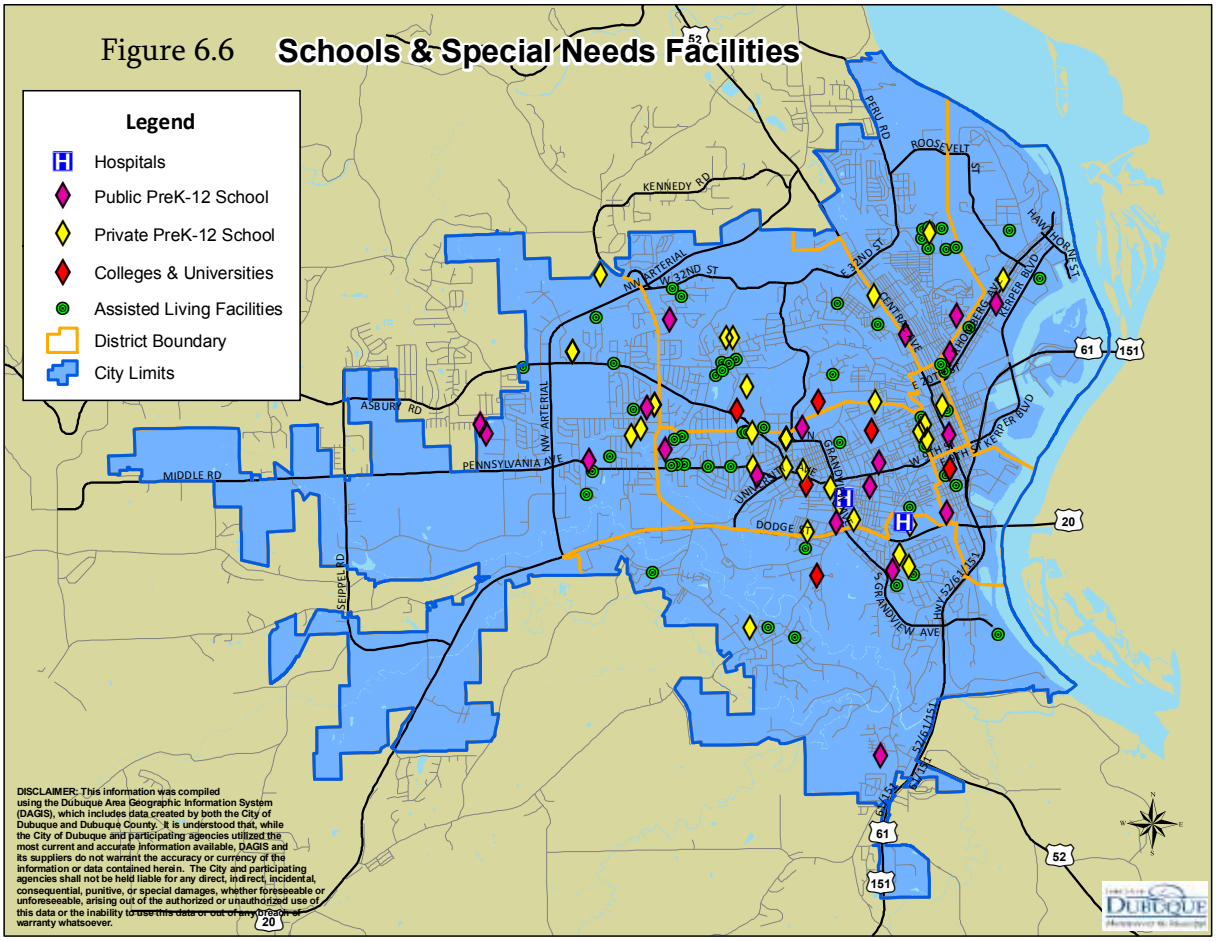
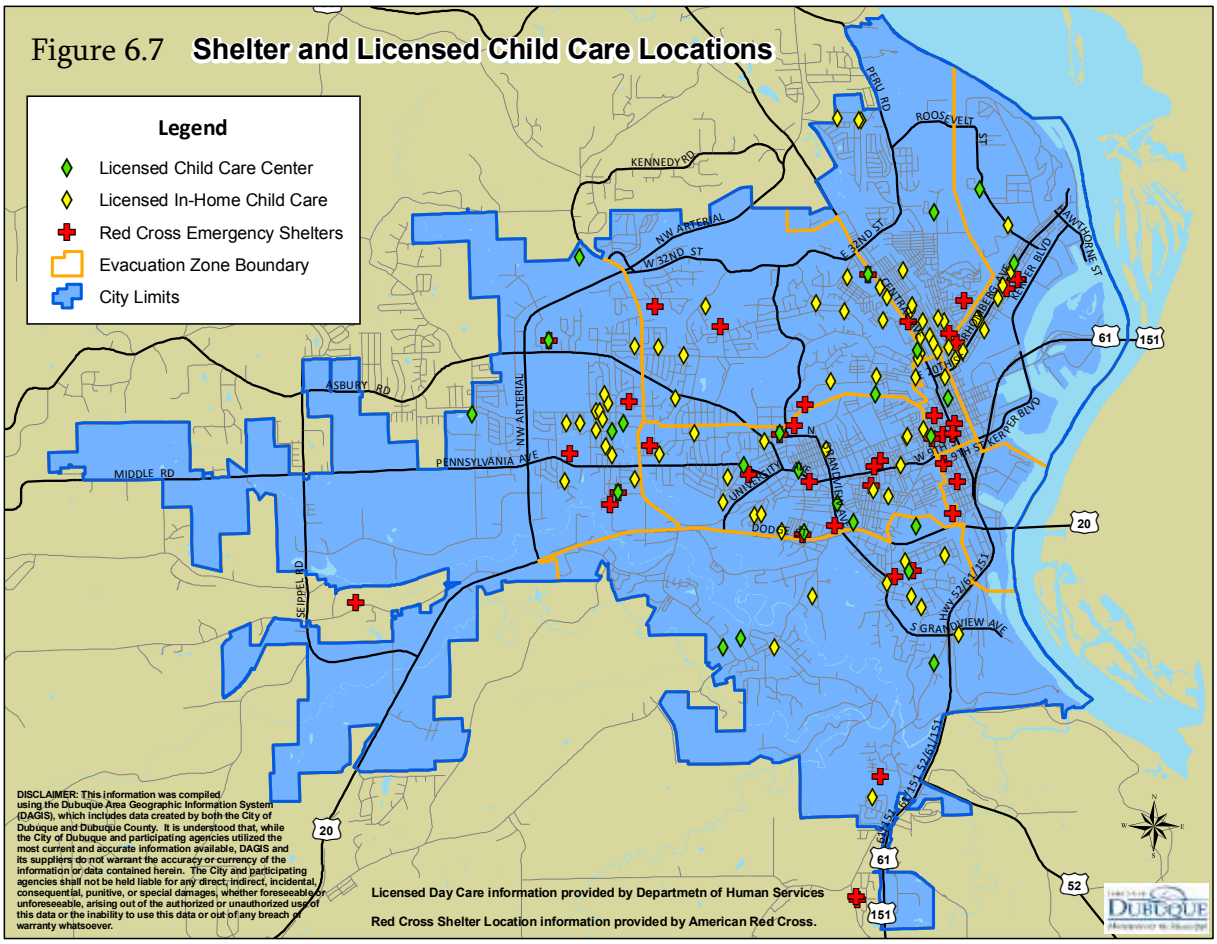


Figure 6.6 **Schools & Special Needs Facilities**





Incident Management Manual

In 2005 the Dubuque County Multi Disciplinary Safety Team (MDST) adopted an incident management manual. The manual outlines a traffic assistance program designed to aid agencies in rerouting vehicle traffic in the event of a road closure. Road closures can occur at any time due to a variety of different situations, e.g., hazardous material spill, aviation disaster, major vehicle crash, etc. The traffic assistance program is designed to safely reroute traffic around the area affected by an incident and prevent any secondary injuries or property damage.

Dubuque Safe Routes to School

The goal of the Safe Routes to School program is to enable community leaders, schools and parents to improve safety and encourage more children to walk and bicycle to school safely. The Dubuque Safe Routes to School Plan seeks to achieve this goal through two objectives. The first objective is to involve a variety of local entities in the planning process. Involving city, county, and school officials in the planning process will ensure that parents, local governments, and the schools are communicating and working together on walking and biking projects. The second objective of the plan is to provide a list of projects for each school that, when implemented, will provide students with safer opportunities to walk and bike to school, and encourage students to take advantage of these opportunities. The project list can be used to guide future investments in walking and biking. More information on the Safe Routes to School can be found in Chapter 3 or in the Dubuque Area Safe Routes to School Plan

Future Security Needs

The Evacuation Plan and Incident Management Manual address public safety and security during an emergency, but these plans do not explain how to address these issues on an everyday basis, or how to prevent emergencies from occurring. DMATS is working on incorporating transportation security directly into the metropolitan transportation planning process, particularly in project selection and prioritization. DMATS is including police, fire, other emergency, and transit agencies in transportation project design. The hope is that including emergency personnel early in the planning process will result in a transportation system that is more secure overall.

The prime areas were DMATS staff are working include the following:

Roads and Bridges

- Install traffic cameras at major intersections to help with law enforcement and criminal investigations.
- Implement ITS that can aid in incident management, e.g., display boards that warn drivers of an incident, and can help route traffic away from the area.
- Ensure that roads and bridges remain passable in during an emergency.
- Train all personnel in emergency response procedures and protocols, and conduct annual refresher training.
- Establish an ongoing means of communication with fire, sheriff, and police departments and the County EMS to ensure sharing of crime and security information among all concerned.
- Work with safety teams and County EMS regarding security and emergency preparedness plans.
- Improve safety for children who walk and bike to school.

Transit

- Review evacuation plans in the region, focusing on transit security plans. Plan review will ensure compatibility and clarification regarding responsibility and procedures in the event of an incident.
- Review security measures against checklists developed by FTA and IPTA.
- Create an action plan with County Sheriff and City Police Department to request random patrols of transit systems headquarters, the bus depot, and "hot spots" on Friday and Saturday evenings.
- Work with Safety teams and County EMS regarding security and emergency preparedness plans, and ensure that all are familiar with the basic operation of a bus, and are aware of the bus depot's layout.
- Establish an ongoing means of communication with Fire and Police Departments and the County EMS to ensure sharing of crime and security information among all concerned.
- Define transit systems role in non-transit emergencies.
- Train all personnel in emergency response procedures and protocols, and conduct annual refresher training.
- Conduct at least one emergency exercise annually.
- Install cameras on buses that are equipped with a "panic button" that will capture a higher quality of video footage.
- Purchase newer buses to be equipped with full time cameras
- Equip buses with mobile data terminals and GPS systems.

- Install security cameras at transit offices and bus depots.
- Transit offices secured with passcard swipe locks.

Safety and Security Performance measures

- Reduce the number of fatalities and decrease the economic impact from highway-related accidents
- Encourage Cities and County to implement bicycle and pedestrian improvements, services, and programs.
- Encourage local government participation in safety outreach activities, and continue bicycle and pedestrian safety education.
- Continue use of incident management patrols, coordination with law enforcement agencies, and implementation of safety and mobility projects by the members to respond to safety and security trends and issues.
- Work closely with the IADOT Rail Division on planning studies and project development activities for rail safety projects, including rail grade separations at targeted locations.
- Encourage transit systems to secure funding for full-time cameras on all buses.
- Encourage transit systems to secure funding for automated vehicle locator system.
- Encourage transit systems to contact the fire department and county emergency management regarding security and emergency preparedness plans, and ensure that all are familiar with the basic operations of a bus and are aware of the bus depot's layout.
- Encourage transit systems develop and execute at least one emergency exercise annually.
- Encourage cities and counties to continue to implement bicycle parking and encourage its installation by developers, business owners, schools, and other institutions.
- Coordinate transportation and operational agencies with the county emergency and hazard mitigation plans
- Ensure continued cooperation between transportation agencies and transit systems.
- Implement Safe Routes to School projects.

Chapter 7: Projects

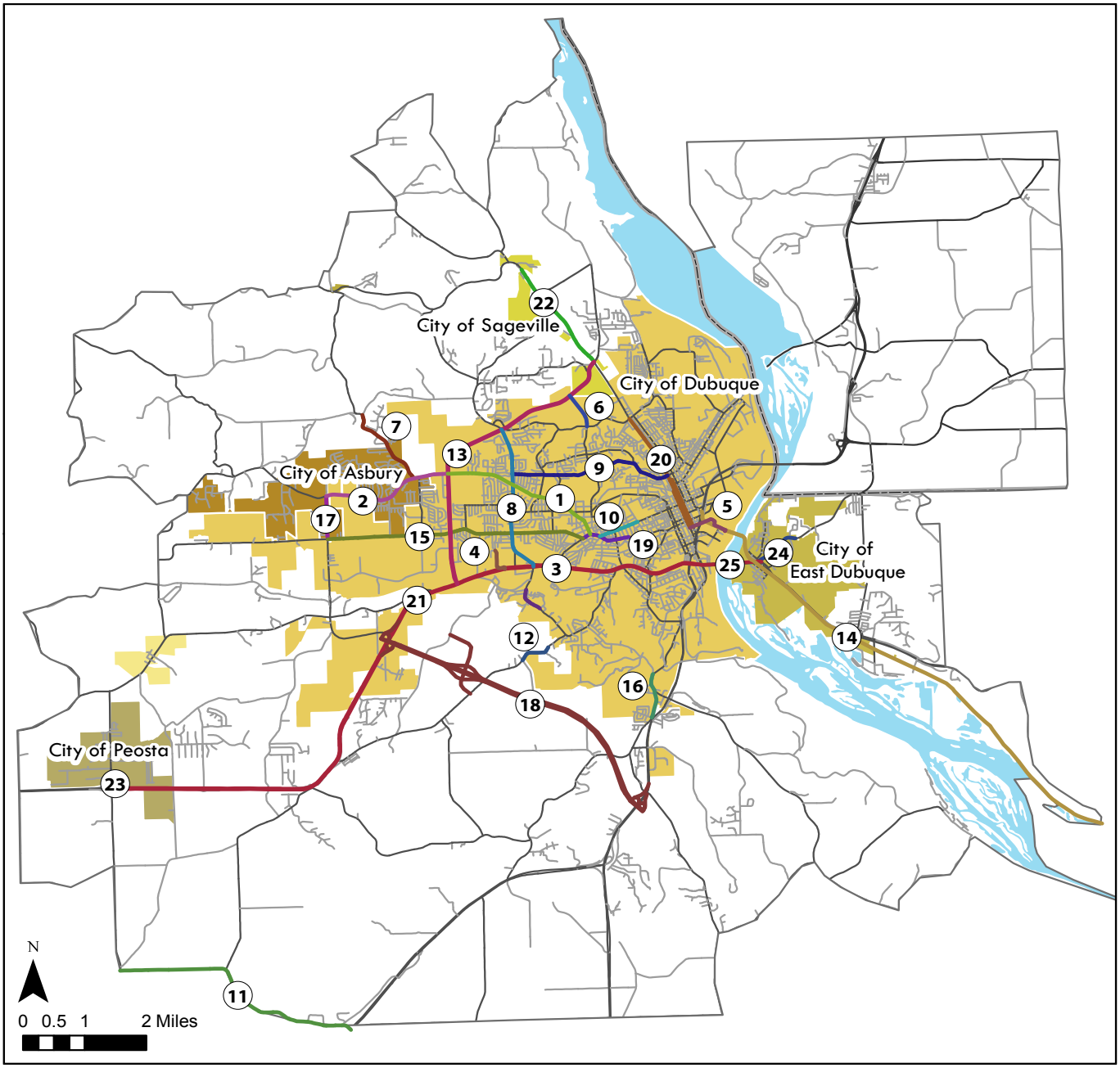
For the 2040 LRTP the DMATS policy committee has chosen to address the future projects on a corridor level. In past LRTPs, each transportation mode had its own project list. While this approach communicated all of the necessary information, it did not effectively convey the relationships among multiple projects along the same corridor. This new method will allow DMATS to conduct corridor level analysis that will help the policy committee to examine the impacts of all modes on the transportation network.

Based on the list of issues for the DMATS area, staff and the Technical Advisory Committee identified a series of projects through a selection process which would address the major capacity, safety and access control issues. These projects were then tested using the DMATS Travel Demand Model and the adopted DMATS socioeconomic forecasts to determine if the proposed projects would result in the expected traffic improvements at the horizon year (2040). The cost of development of the proposed projects was estimated using construction estimates and right-of-way costs provided by the city of Dubuque's engineering department and the IDOT.

In several cases, more specific cost estimates have been developed for projects as part of the environmental assessment and project feasibility process. In those cases, the more specific project cost estimates have been used and identified in the project descriptions.

Project Index **Page**

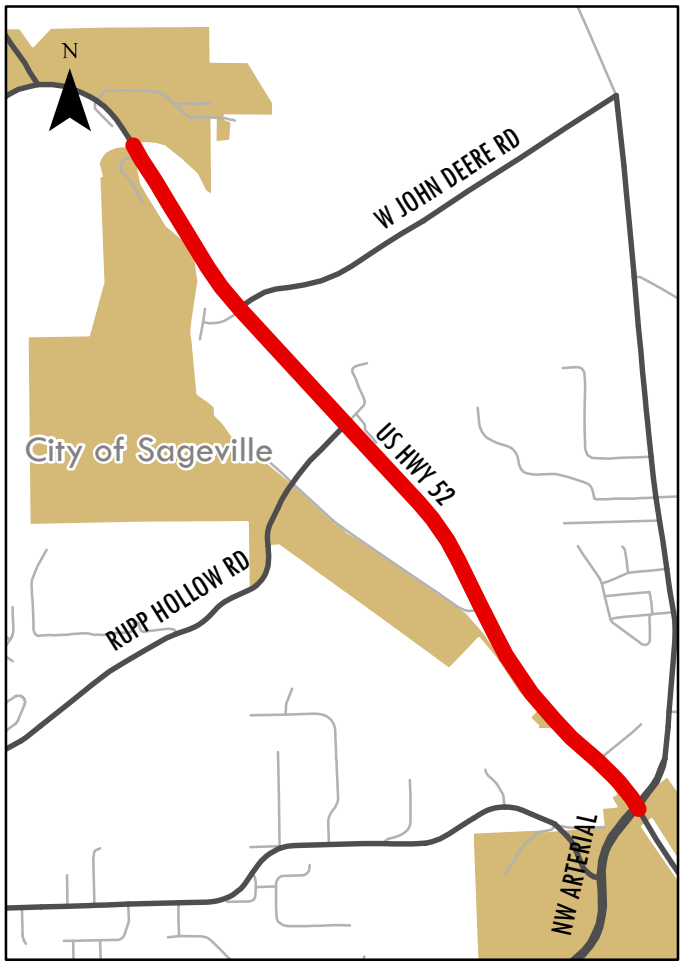
DMATS LRTP Projects

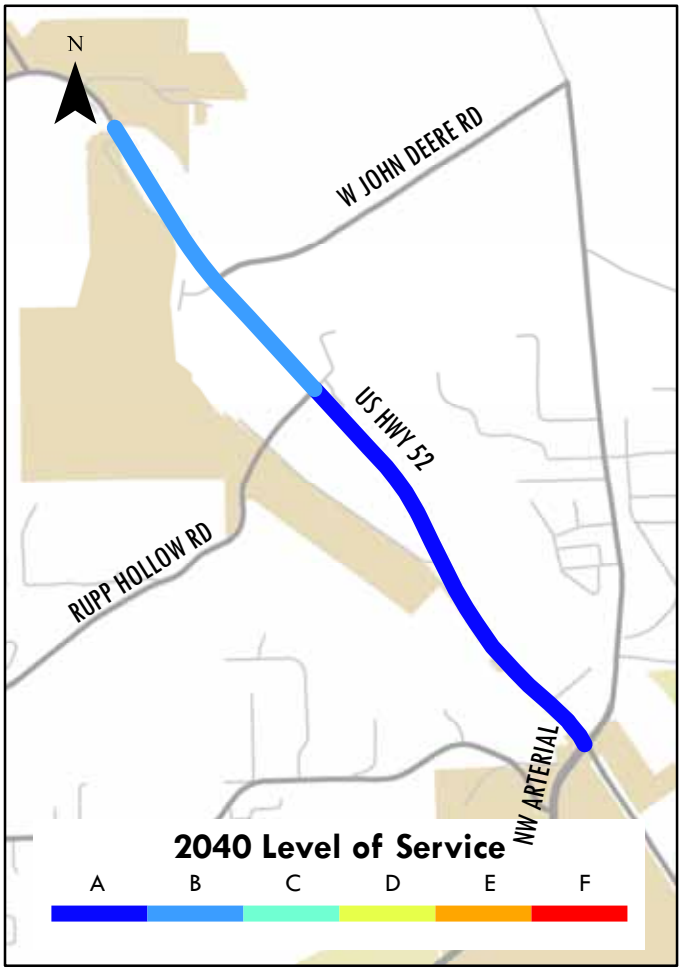


DMATS Project Corridors

- 1 - ASBURY RD EAST
- 2 - ASBURY ROAD WEST
- 3 - CEDAR CROSS RD
- 4 - CENTURY DR
- 5 - E 7TH ST
- 6 - GRANDVIEW AVE EXT
- 7 - HALES MILL RD
- 8 - JOHN F KENNEDY RD
- 9 - KAUFMANN AVE
- 10 - LORAS BLVD
- 11 - MONASTERY RD
- 12 - NORTH CASCADE RD
- 13 - NW ARTERIAL
- 14 - PASSENGER RAIL & INTERMODAL
- 15 - PENNSYLVANIA AVE
- 16 - ROCKDALE RD
- 17 - SEIPPEL RD
- 18 - SW ARTERIAL
- 19 - UNIVERSITY AVE
- 20 - US 52 CENTRAL & WHITE
- 21 - US HWY 20
- 22 - US HWY 52
- 23 - PEOSTA ROUNDABOUT
- 24 - EAST DUBUQUE PROJECTS
- 25 - US HWY 20 BRIDGE

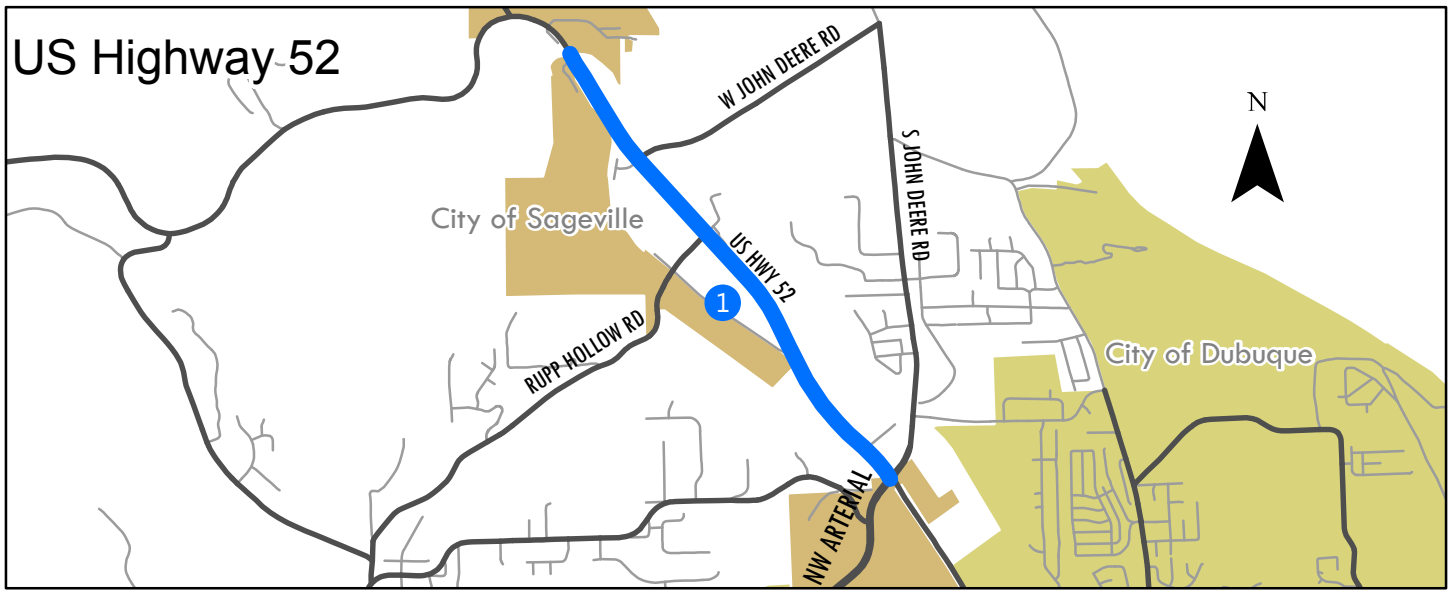
US HWY 52



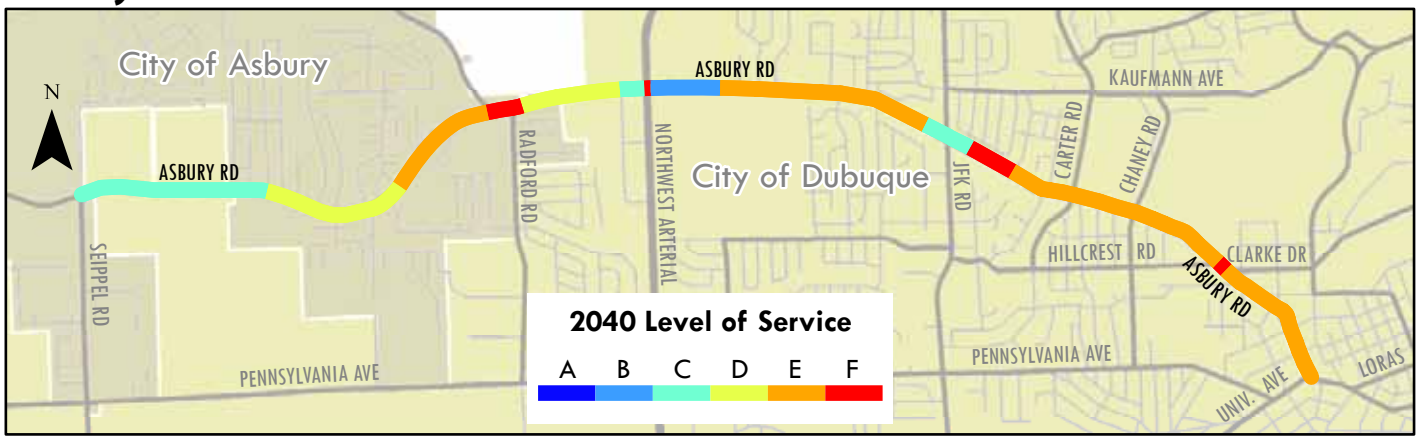


Project Elements

Numbers on map correspond with item numbers in the accompanying table



Asbury Road East



Project Elements

Numbers on map correspond with item numbers in the accompanying table

Asbury Road East

Resurfacing

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
1	Asbury	University	JFK	1.57	2	$644,160	$2,022,662	HMA Resurfacing
	Total						**$2,022,662**	

Reconstruction

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
2	Asbury	University	JFK	1.73	3	$1,700,000	$8,823,000	PCC Reconstruction, Water main, Sanitary Sewer
	Total						**$8,823,000**	

Capacity Improvements (Intersection)

Project #	Description of Intersection	Length in Miles	Number of units	Cost per unit or mile	Total Cost	Description of work
3	Asbury Road & Hillcrest/Clarke Drive/Wilbricht				$1,540,000	Intersection realignment
4	Asbury and St. Ambrose Street				$1,050,000	Intersection realignment
	Total				**$2,590,000**	

Bike & Pedestrian

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
5	Asbury	NW Arterial	Matthew John	0.45	2	$533,333	$240,000	Bike Lanes & Sidewalk
6	Asbury	Matthew John	JFK Road	0.64	2	$1,671,875	$1,070,000	Bike Lanes & Sidewalk
7	Asbury	JFK Road	Carter Road	0.48	2	$2,437,500	$1,170,000	Bike Lanes & Sidewalk
8	Asbury	Carter Road	Hillcrest Road	0.56	2	$2,035,714	$1,140,000	Bike Lanes & Sidewalk
9	Asbury	Wilbricht Lane	St. Ambrose	0.18	2	$2,555,555	$460,000	Bike Lanes & Sidewalk
	Total						**$4,080,000**	

Safety & Security

Project #	Road	From	To	Length in Miles	Number of units	Cost per unit	Total Cost	Description of work
10	Asbury	NW Arterial	University		4	$20,000	$80,000	Enhanced Sidewalks
11	Asbury & JFK Road Intersection						$12,000	Spot Intersection Pavement marking
	Total						**$92,000**	

ITS improvements

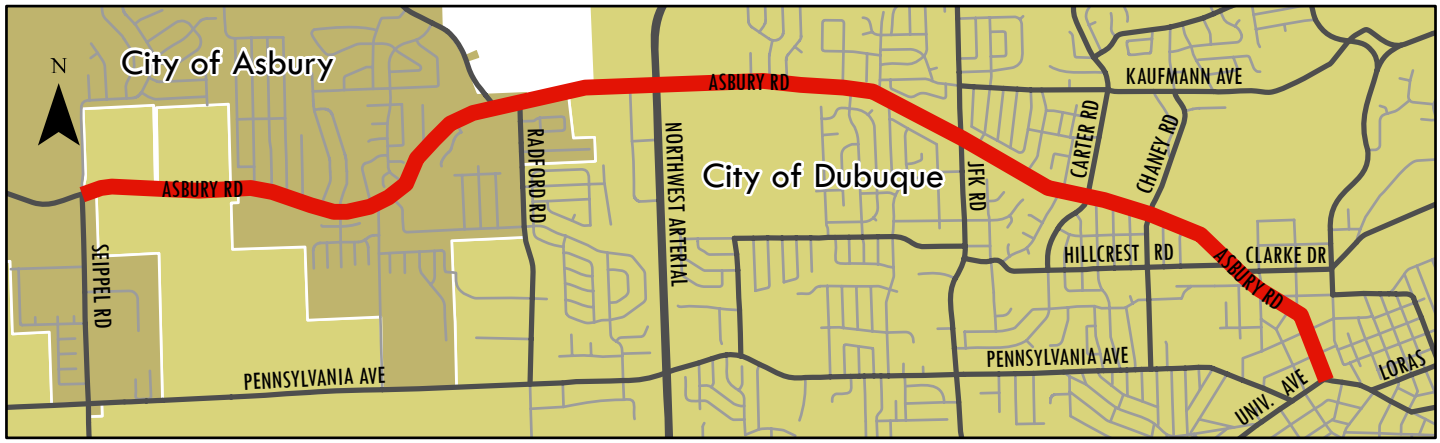
Project #	Road	From	To	Length in Miles	Number of units	Cost per unit or mile	Total Cost	Description of work
12	Asbury	NW Arterial	University	3.57		$150,000	$535,500	Fiber / Switch
13	Asbury	NW Arterial	University		5	$150,000	$750,000	Traffic Signal replacement
14	Asbury	NW Arterial	University		20	$10,000	$200,000	Cameras
	Total						**$1,485,500**	

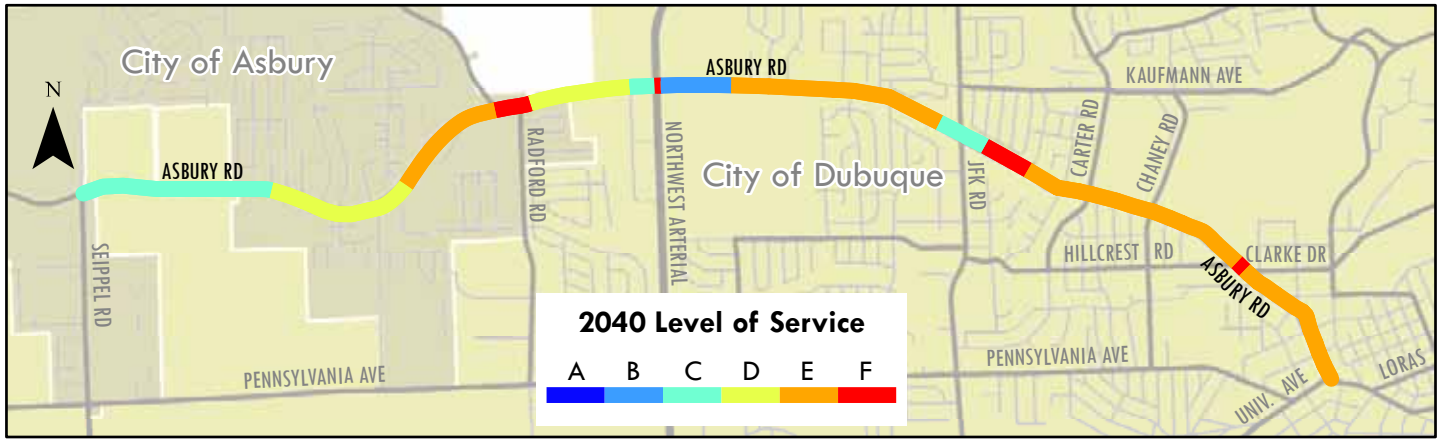
Right of Way

Project #	Description of Intersection	Length in Miles	Number of Lanes	Cost per miles	Total Cost	Description of work
3	Hillcrest Rd./ Clarke Dr./ Wilbricht Ln. Realignment				$553,200	Acquire Right of Way
4	Asbury Rd/St. Ambrose St Realignment				$401,940	Acquire Right of Way
5	Asbury Rd/Bike Lanes-NW Arterial to Matthew John Dr.				$21,369	Acquire Right of Way
6	Asbury Rd/Bike Lanes-Matthew John Dr. to JFK Rd.				$31,566	Acquire Right of Way
7	Asbury Rd. Bike Lanes-JFK Rd to Carter Rd.				$25,242	Acquire Right of Way
8	Asbury Rd.Bike Lanes-Carter Rd to Hillcrest Rd.				$10,692	Acquire Right of Way
9	Asbury Rd. Bike Lanes-Wilbricht Ln to St. Ambrose St.				$7,806	Acquire Right of Way
	Total				**$1,051,815**	

Total Cost **$20,144,977**

Asbury Road West





Project Elements

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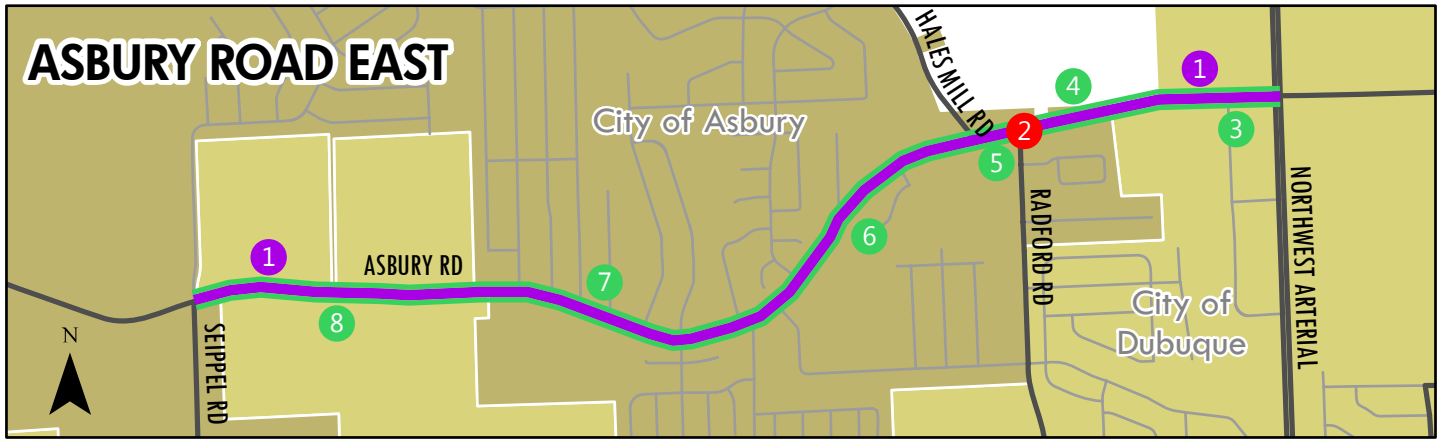


Asbury Road West

Resurfacing								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Asbury	NW Arterial	Seippel Rd				$97,650	HMA Resurfacing
	Total						**$97,650**	

Capacity Improvements (Intersection)					
Project #	***Description of Intersection***	***Length in Miles***	***Number of units***	***Cost per unit or mile***	***Total Cost***	***Description of work***
2	Asbury Rd and Radford Rd				$71,000	Turn Lane
	Total				**$71,000**	

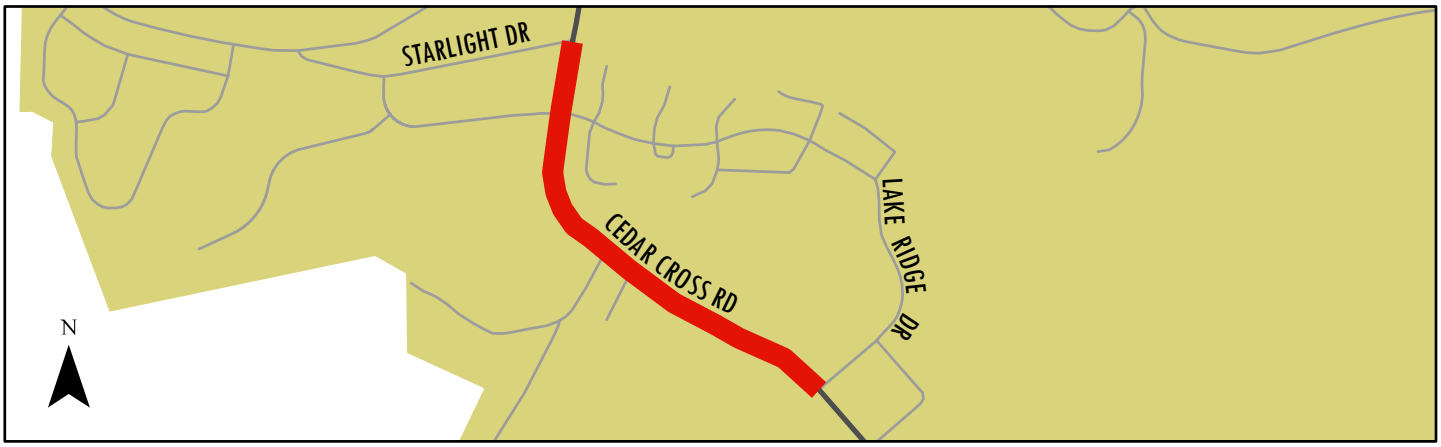
Bike & Pedestrian								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
3	Asbury	NW Arterial	Resurrection Cemetery	0.21				Bike Lane
4	Asbury	Resurrection Cemeterty	Radford Rd	0.19				Bike Lane
5	Asbury	Radford Rd	Hales Mill Rd	0.13				Bike Lane
6	Asbury	Hales Mill Rd	Antler Ridge	0.37				Bike Lane
7	Asbury	Antler Ridge	Asbury City Limits	0.39				Bike Lane
8	Asbury	City of Dubuque	Seippel Rd	0.52				Bike Lane
	Total						**$95,850**	

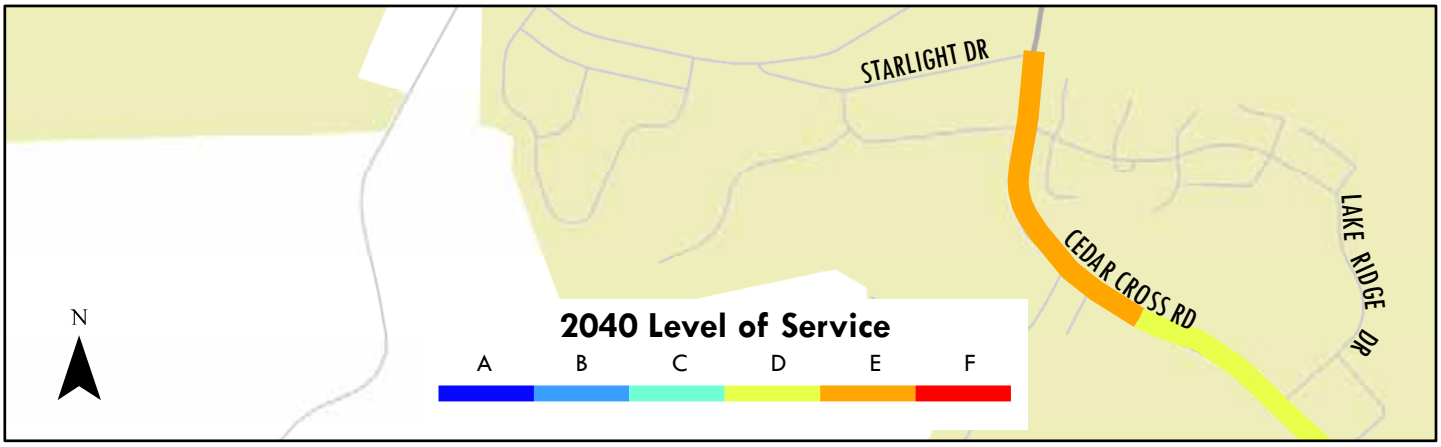
ITS improvements								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of units***	***Cost per unit or mile***	***Total Cost***	***Description of work***
							$150,000	Traffic Signal
							$75,000	Pedestrian Signal
	Total						**$225,000**	

Right of Way						
Project #	***Description of Intersection***	***Length in Miles***	***Number of Lanes***	***Cost per miles***	***Total Cost***	***Description of work***
					$30,616	
					$20,662	
					$45,321	
					$6,294	
	Total				**$102,893**	

Total Cost **$592,393**

Cedar Cross Road





Project Elements

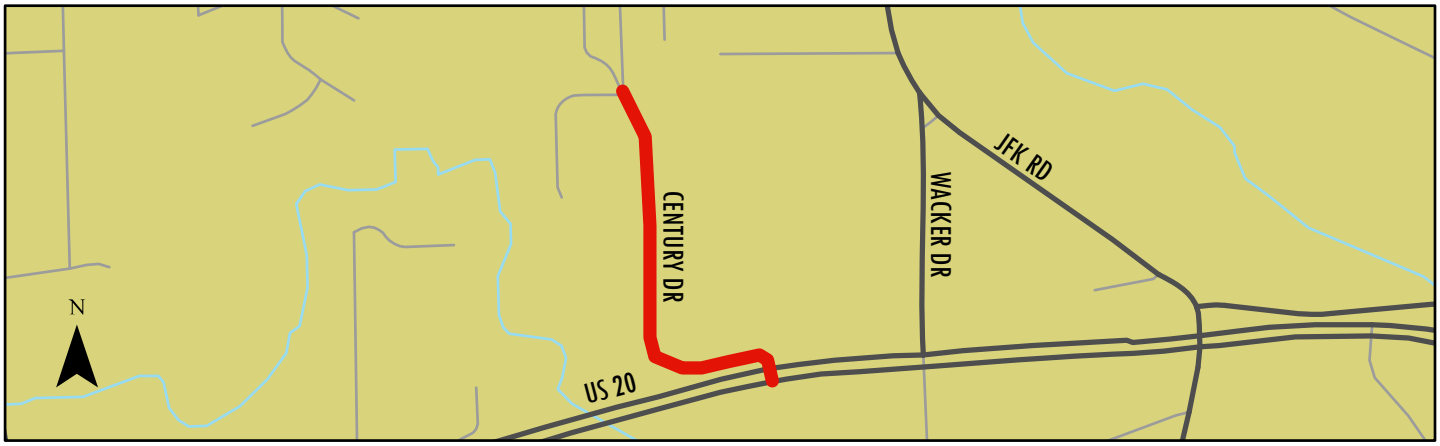
Numbers on map correspond with item numbers in the accompanying table

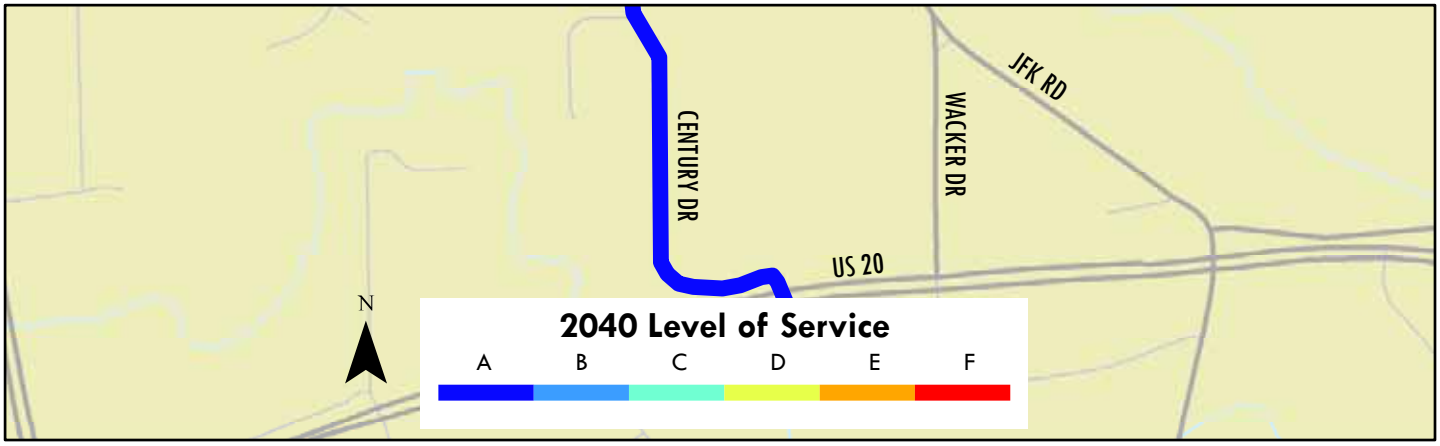
Cedar Cross Road

Reconstruction								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Cedar Cross Rd	725' E of Starlight Dr	Lake Ridge Dr	0.44	3	$3,600,000	$1,700,000	Reconstruct pavement, new sidewalks, bike lanes, add center turn lane, new utilities.
			Total				**$1,700,000**	
Safety & Security								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of units***	***Cost per unit***	***Total Cost***	***Description of work***
2	Cedar Cross Rd	725' E of Starlight Dr		0.44			$100,000	Street Lighting
			Total				**$100,000**	
ITS improvements								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of units***	***Cost per unit or mile***	***Total Cost***	***Description of work***
3	Cedar Cross Rd	725' E of Starlight Dr		0.44			$60,000	Fiber Optics
			Total				**$60,000**	
Right of Way								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of units***	***Cost per unit***	***Total Cost***	***Description of work***
	Cedar Cross Rd	725' E of Starlight Dr	Lake Ridge Dr	0.44	35,500 sq ft	$8.11	$288,000	Widening Roadway
			Total				**$288,000**	

Total Cost **$2,148,000**

Century Drive





Project Elements

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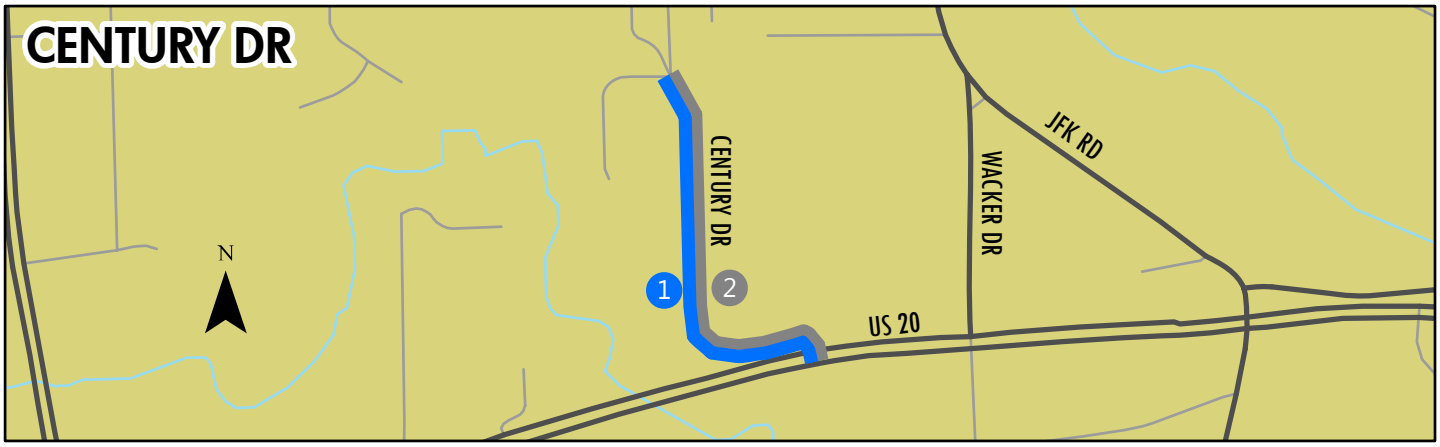
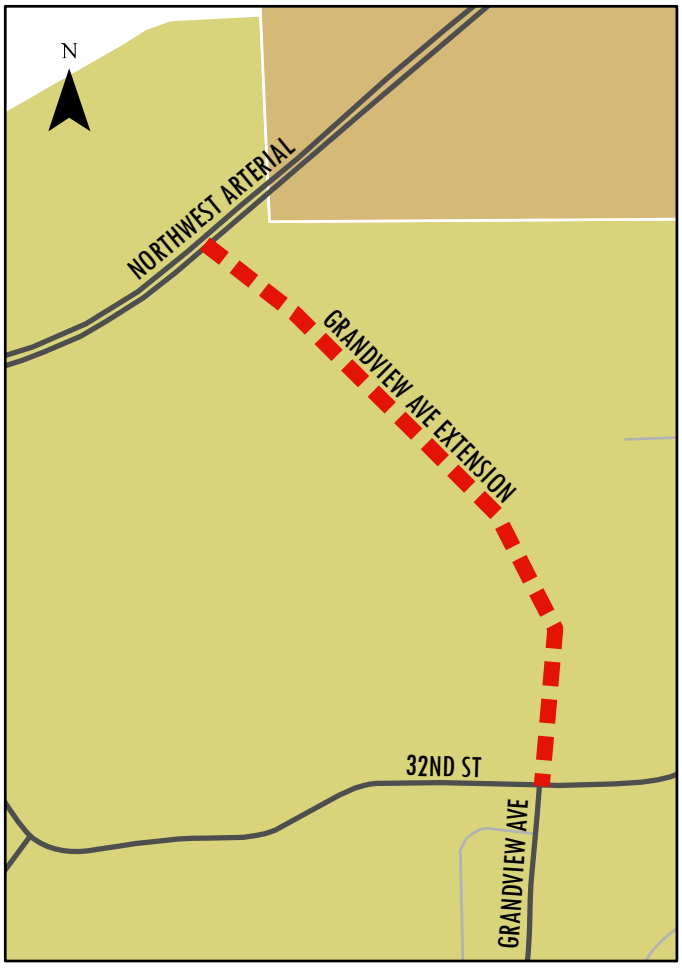


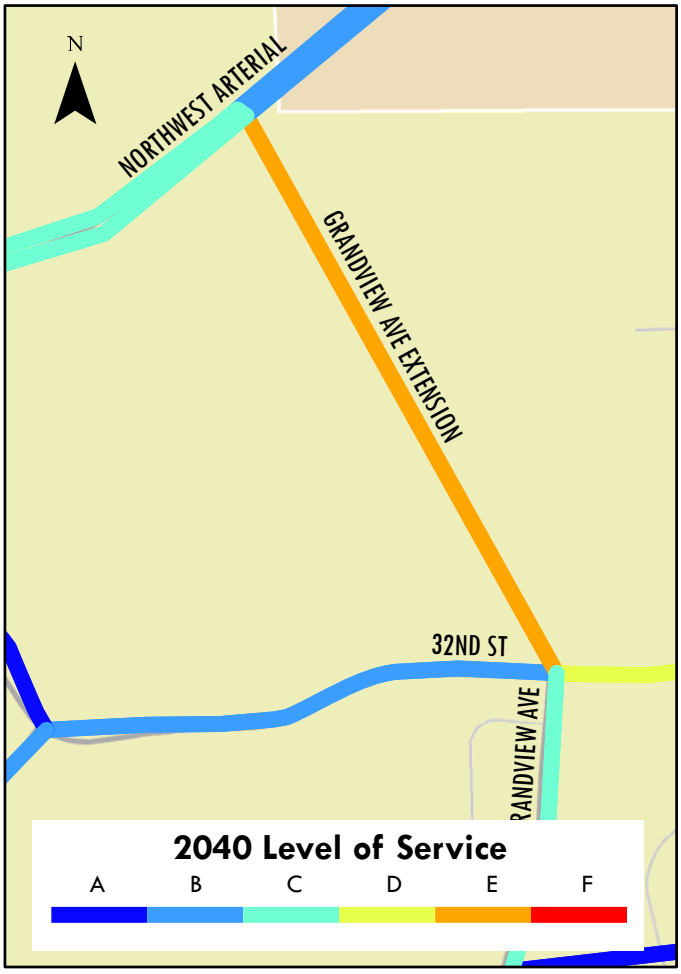
Century Drive

Reconstruction								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Century Dr	Sylvan Dr	US Hwy 20	0.43	2	$3,025,000	$1,300,000	Pavement reconstruction, new utilities, sidewalks.
	Total						**$1,300,000**	
ITS improvements								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of units***	***Cost per unit or mile***	***Total Cost***	***Description of work***
2	Fiber Optics			0.43			$60,000	Fiber Optics
	Total						**$60,000**	
Right of Way								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of units***	***Cost per unit***	***Total Cost***	***Description of work***
	Century Dr	Bies Dr	Sylvan Dr	0.06	3,200 sq ft	$8.00	$25,600	Widening Roadway
	Total						**$25,600**	

Total Cost **$1,385,600**

Grandview Avenue Extension





Project Elements

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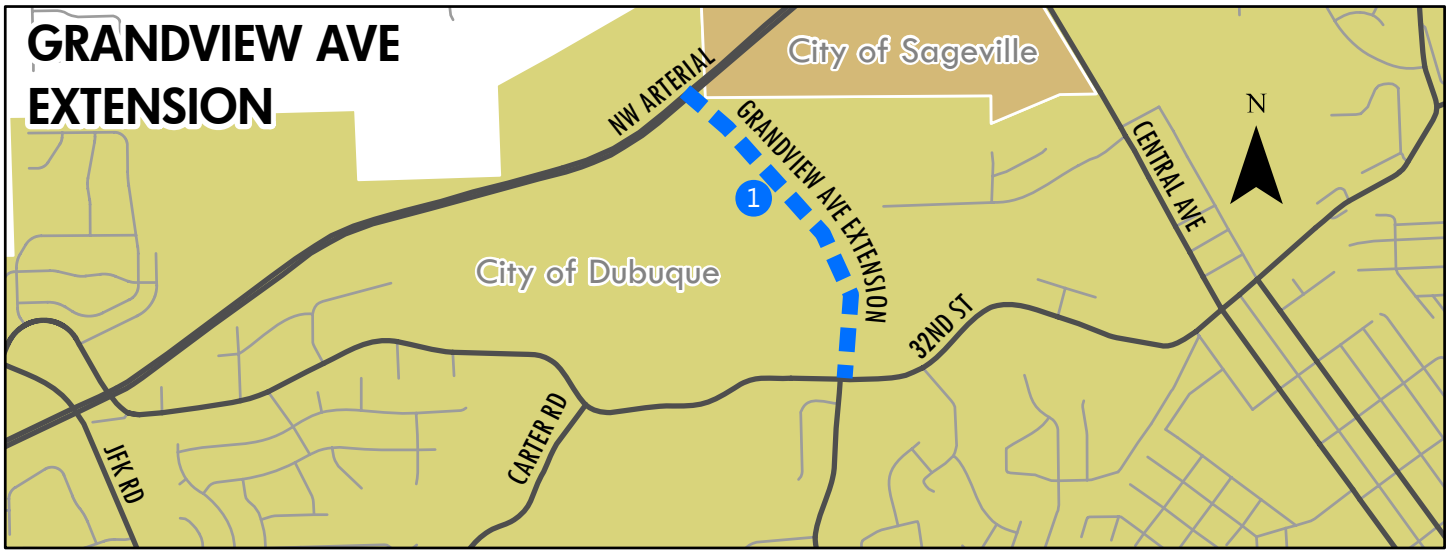
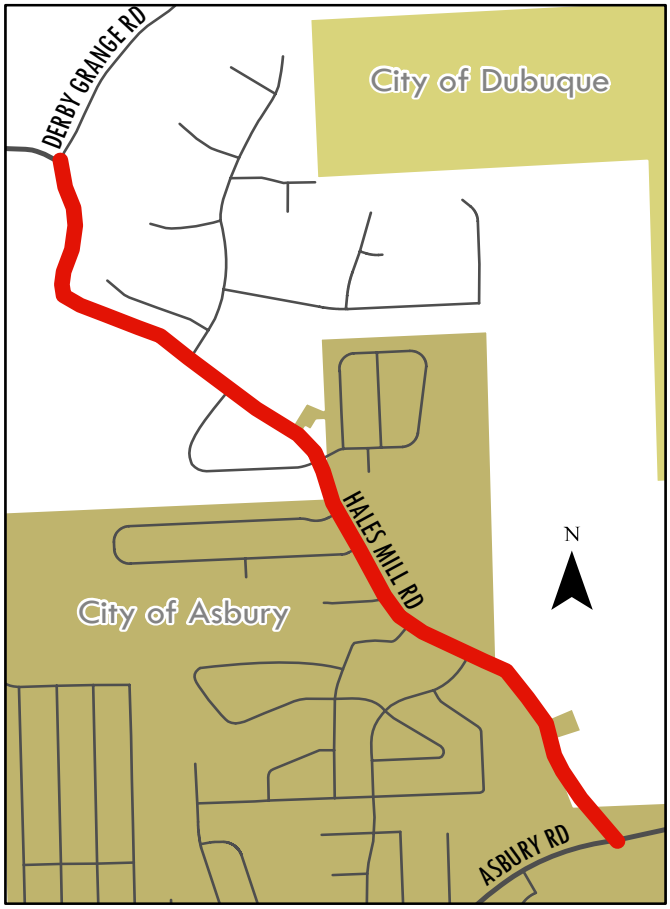


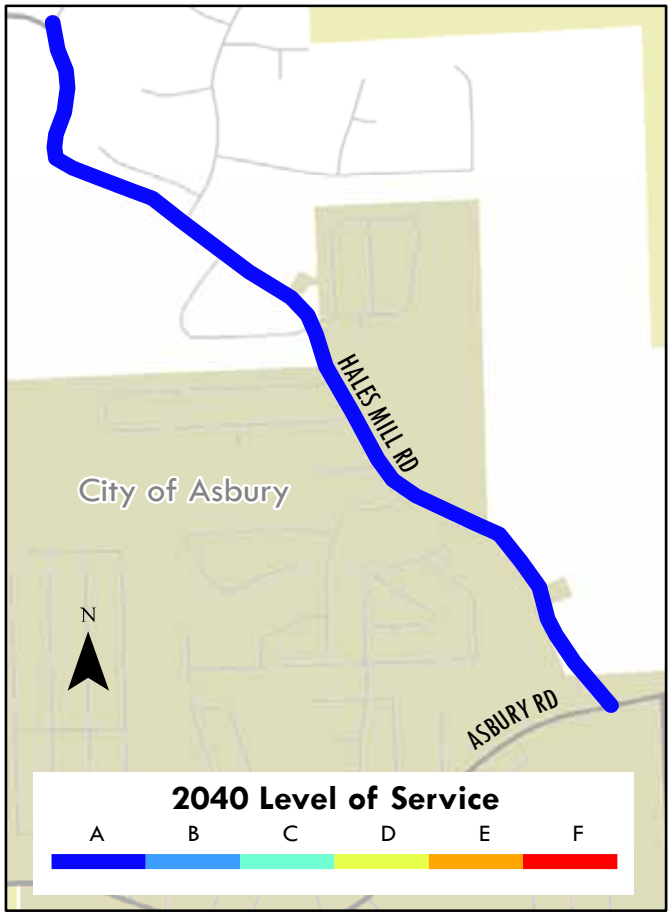
Grandview Avenue Extension

New Construction								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Grandview Ave	32nd St	N.W. Arterial	0.65	3	$4,000,000	$2,600,000	New Roadway
			Total				**$ 2,600,000**	
Right of Way								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of units***	***Cost per unit***	***Total Cost***	***Description of work***
	Grandview Ave	32nd St	N.W. Arterial	0.65	4	$250,000	$1,000,000	New Roadway
			Total				**$ 1,000,000**	

Total Cost **$3,600,000**

Hales Mill Road





Project Elements

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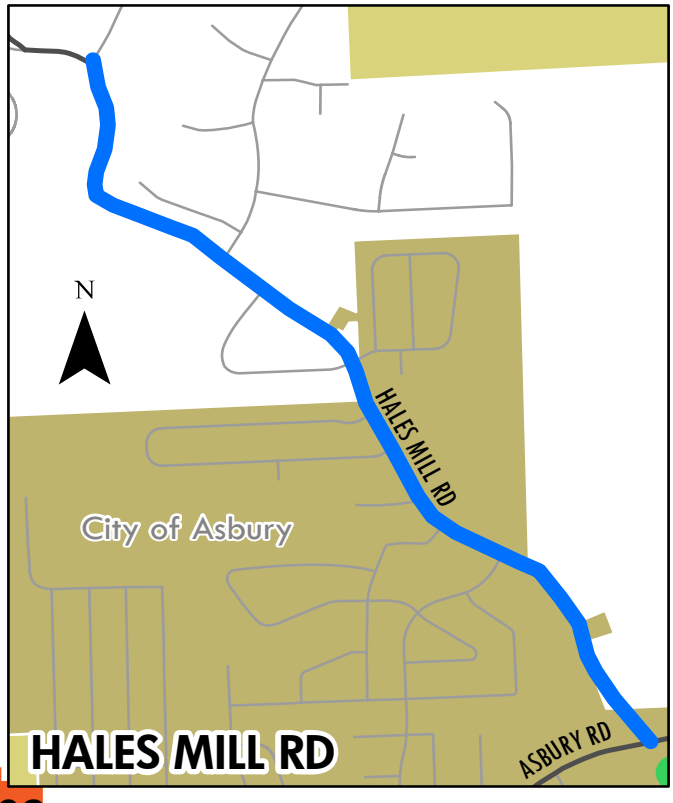
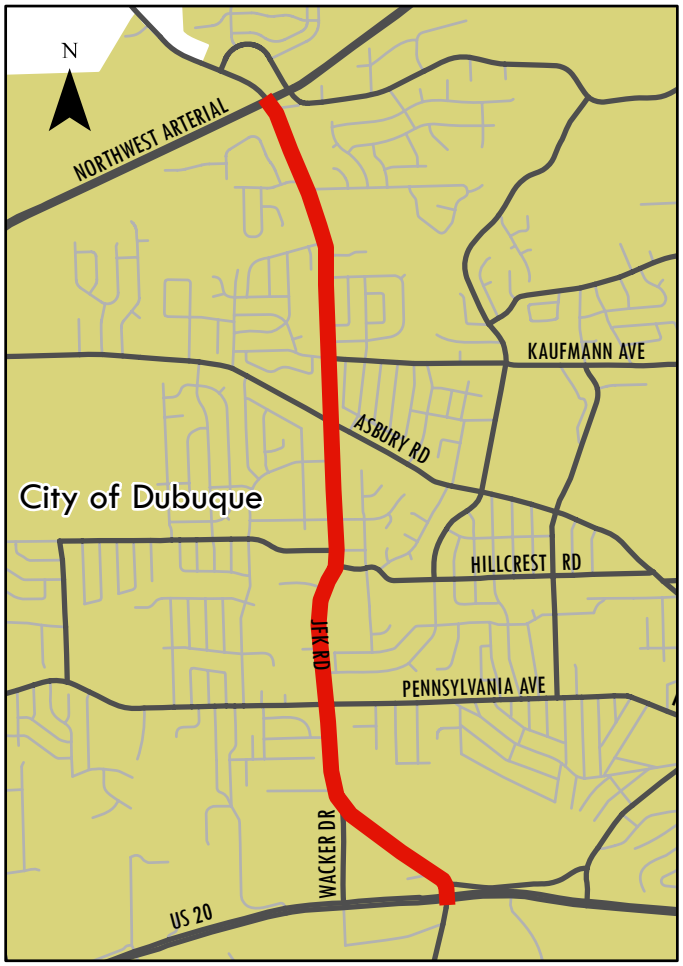


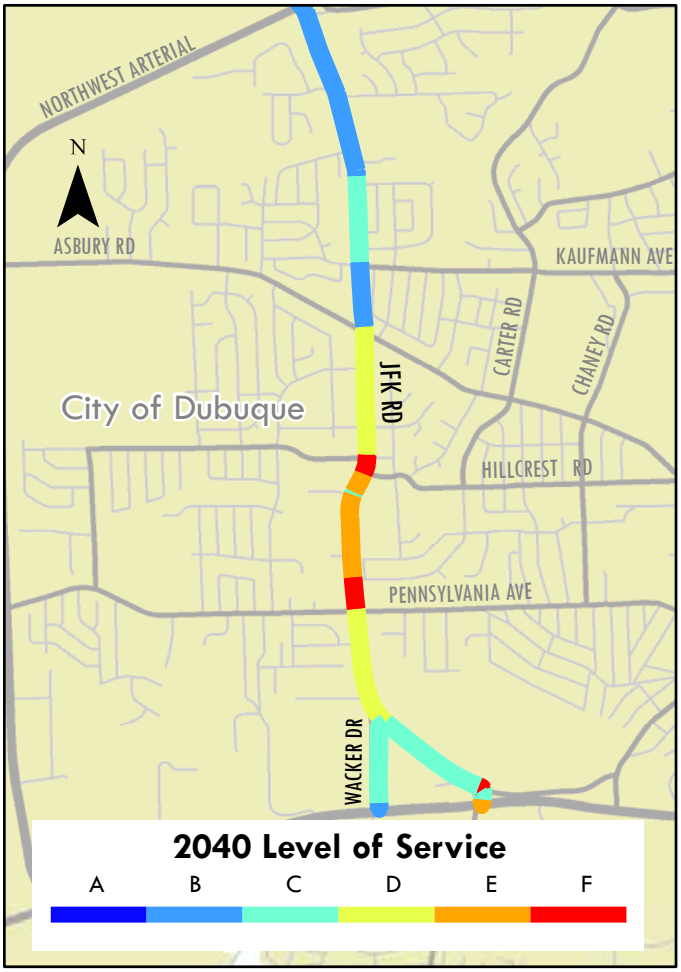
Hales Mill Road

Reconstruction								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Halles Mill Rd	Asbury Rd	Derby Grange Rd	1.45	2	$1,379,310	$2,000,000	Pavement rehab and slope improvement
	Total						**$2,000,000**	

Total Cost **$ 2,000,000**

John F. Kennedy Road





Project Elements

Numbers on map correspond with item numbers in the accompanying table

John F. Kennedy Road

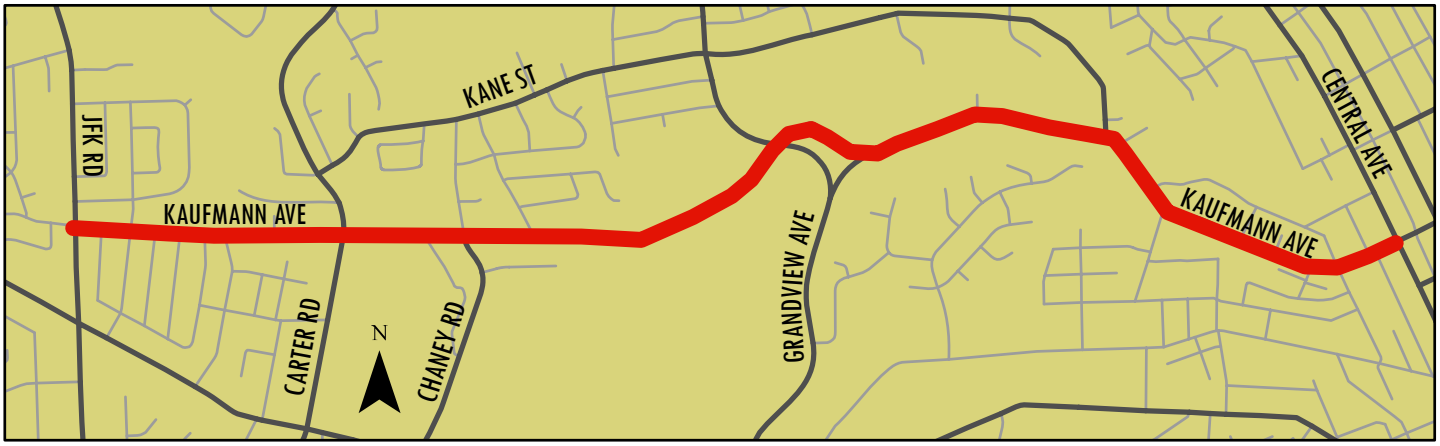
Bike & Pedestrian								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	JFK Rd	Asbury Rd	NW Arterial	0.95	NA	$64,000	$60,000	New sidewalks
2	JFK Rd	Wacker Dr	Stoneman Rd	400 ft	NA	$52,800	$4,000	New sidewalks
	Total						**$64,000**	

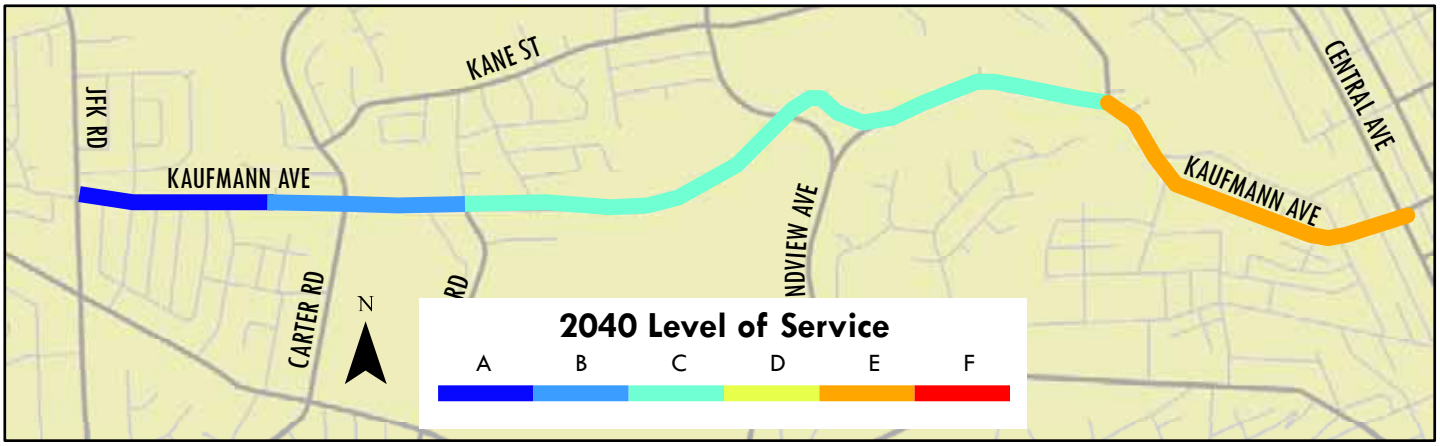
ITS improvements								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of units***	***Cost per unit or mile***	***Total Cost***	***Description of work***
3	JFK Rd	Pennsylvania Ave	US Hwy 20	0.7	NA	$132,000	$ 92,400	Fiber/Conduit
4	JFK Rd	Asbury Rd	NW Arterial	0.95	NA	$132,000	$125,000	Fiber/Conduit
Project #	***Description of Intersection***			***Length in Miles***	***Number of units***	***Cost per unit or mile***	***Total Cost***	***Description of work***
5	JFK Rd & NW Arterial				4	$ 3,750	$15,000	Cameras
6	JFK Rd and Asbury Rd				4	$ 3,750	$15,000	Cameras
7	JFK Rd and Hillcrest Rd				4	$ 3,750	$15,000	Cameras
8	JFK Rd and US Hwy 20				4	$ 3,750	$15,000	Cameras
9	JFK Rd & Wacker Dr				4	$ 3,750	$15,000	Cameras
10	JFK Rd & Wacker Dr							Fiber / Switch
	Total						**$ 292,400**	

Safety & Security						
Project #	***Description of Intersection***	***Length in Miles***	***Number of units***	***Cost per unit***	***Total Cost***	***Description of work***
11	JFK Rd & Wacker Dr				$175,000	Signal Reconstruction and new lighting
	Total				**$175,000**	

Total Cost **$531,400**

Kaufmann Avenue





Project Elements

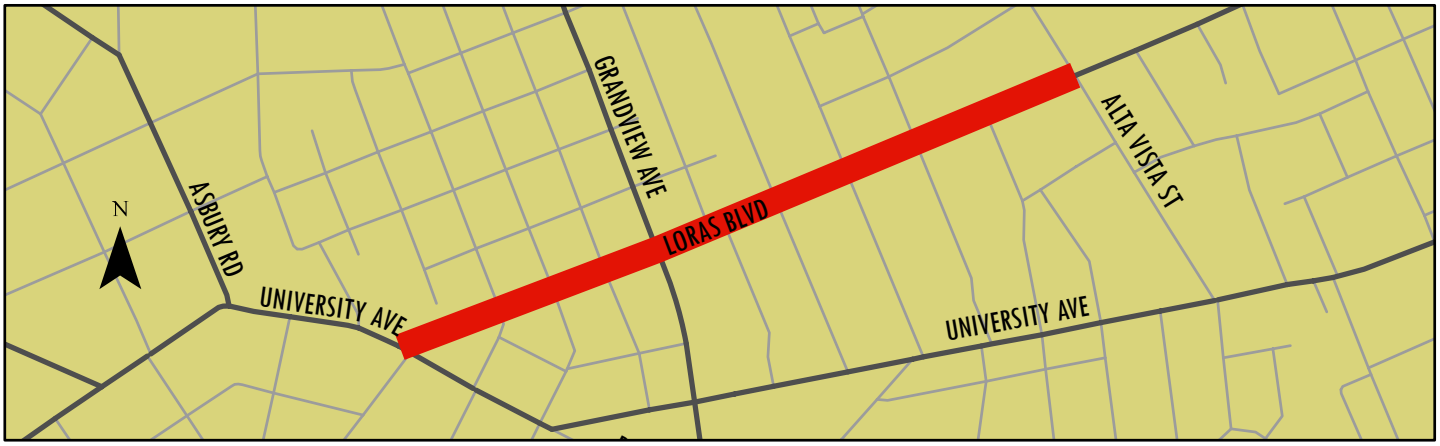
Numbers on map correspond with item numbers in the accompanying table

Kaufmann Avenue

Resurfacing								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Kaufmann Ave	JFK Ave	Carter Rd	0.51	2	$1,320,000	$670,500	Resurfacing of pavement, spot utility repairs, pedestrian ramp improvements
	Total						**$670,500**	
Bike & Pedestrian								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
2	Kaufmann Ave	JFK Rd	Central Ave		2		$50,000	Striping for a bike lane
	Total						**$50,000**	

Total Cost **$720,500**

Loras Boulevard



Project Elements

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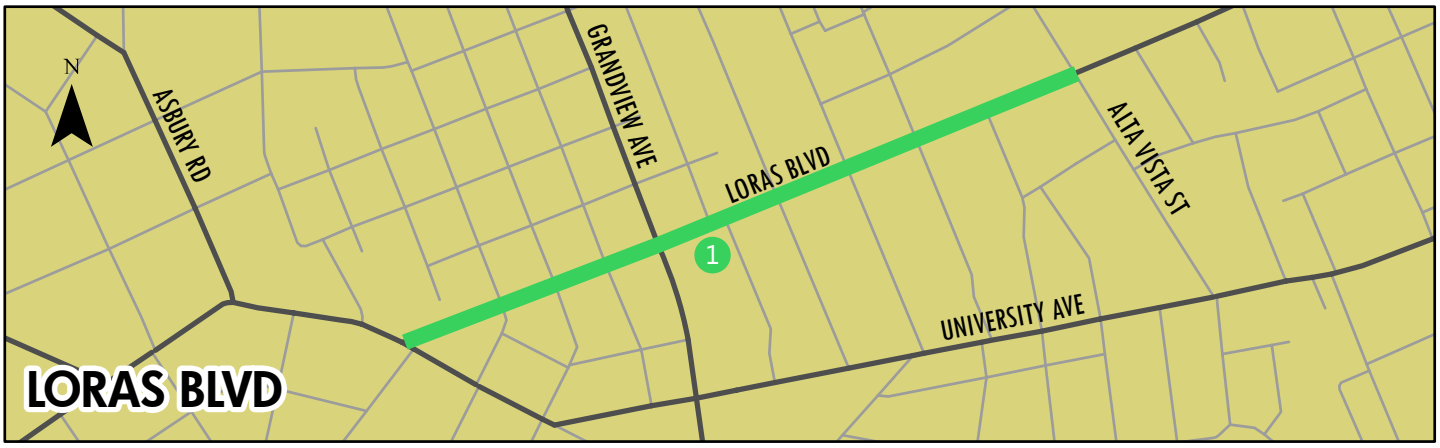
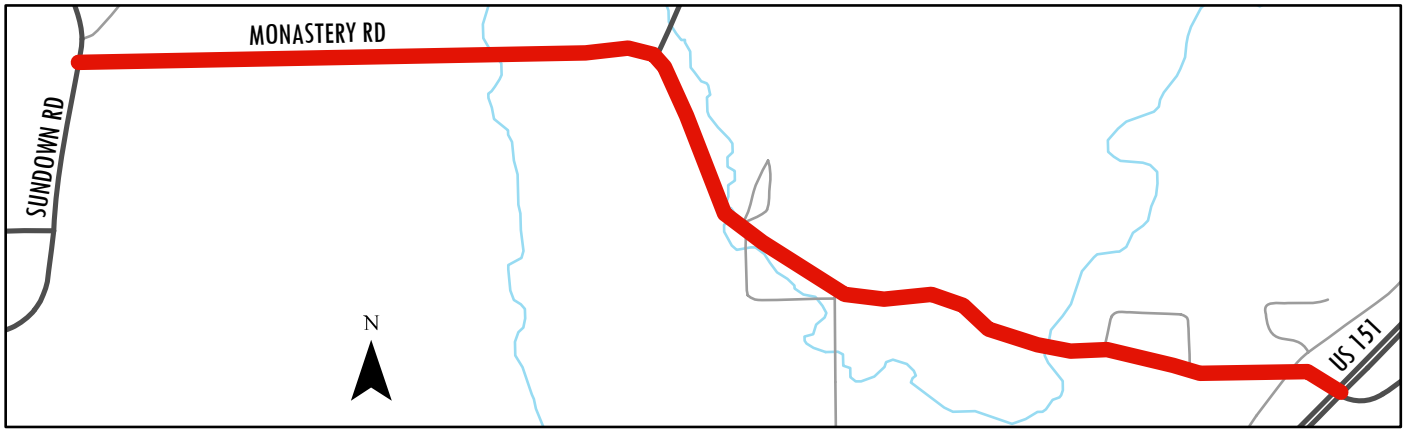


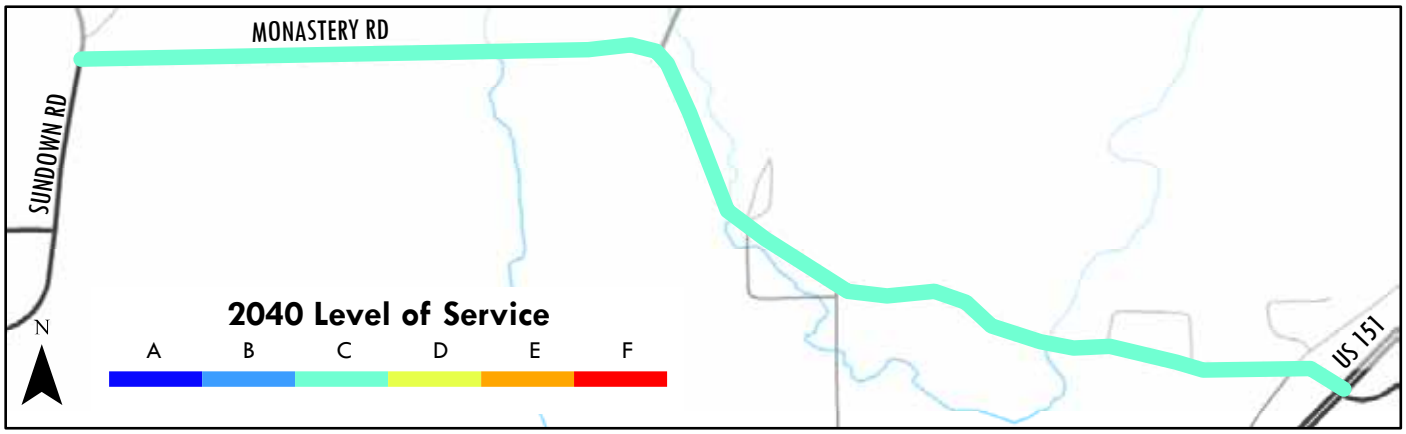
Loras Boulevard

Bike and Pedestrian								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Loras Blvd	University Ave	Alta Vista St				$74,000	Sharrows
	Total						**$74,000**	

Total Cost **$74,000**

Monastery Road





Project Elements

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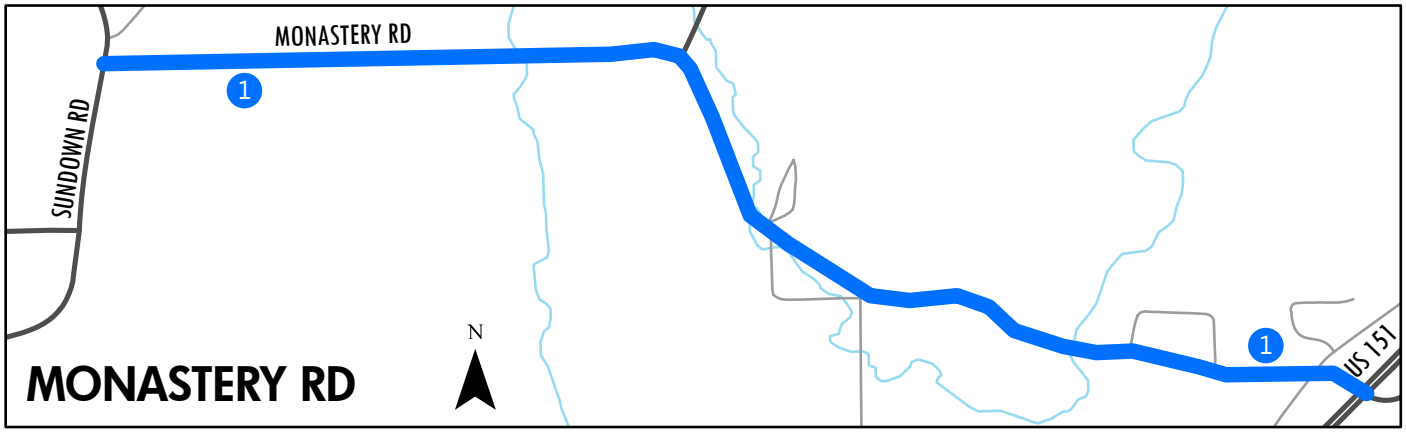
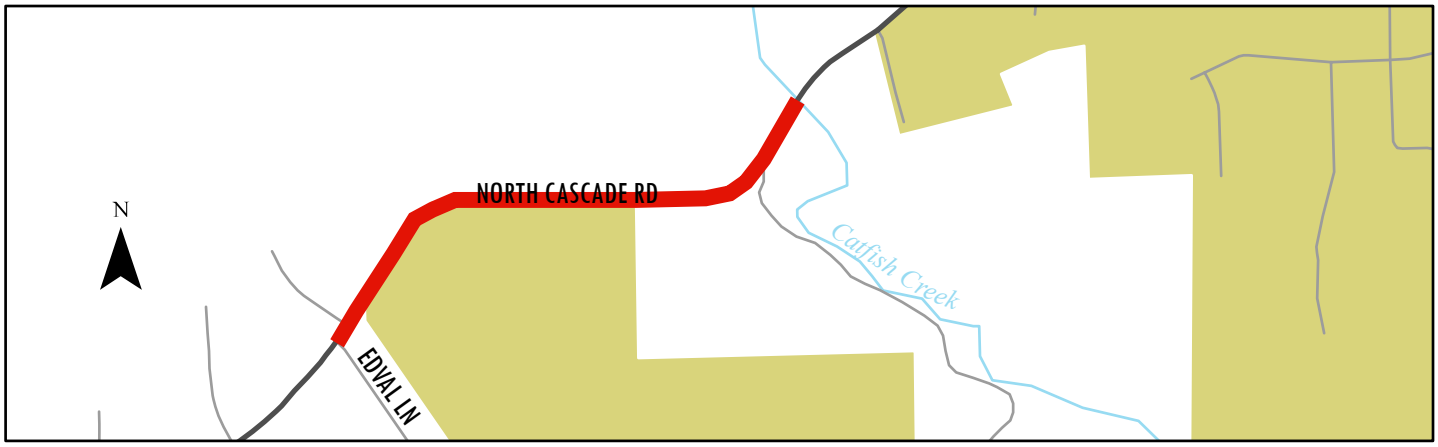


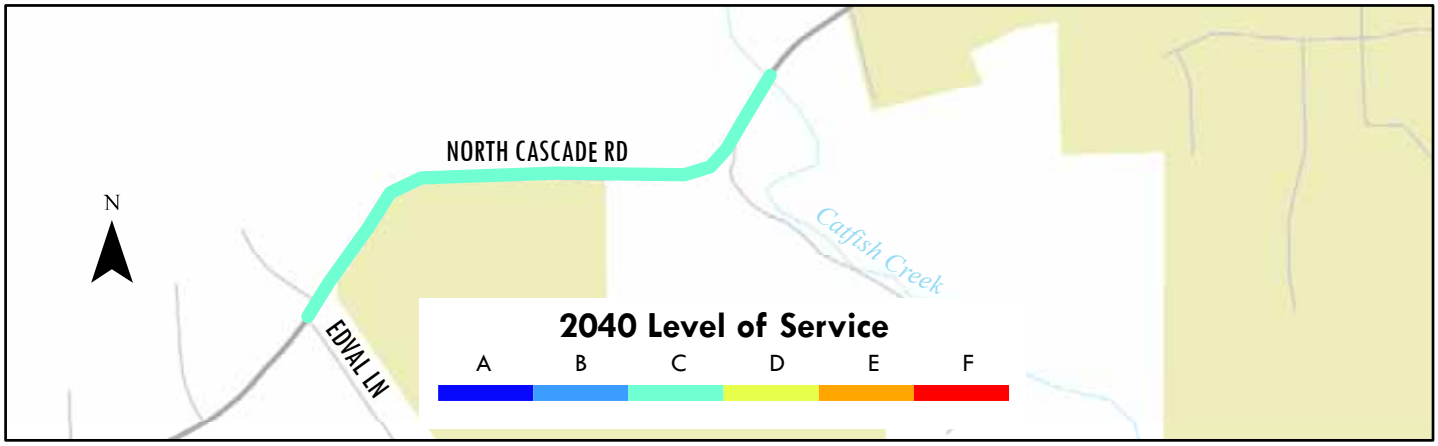
Monastery Road

Reconstruction								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
	Halles Mill Rd	Asbury Rd	Derby Grange Rd	3.8	2	$2,488,421	$9,456,000	Resurfacing
	Total						**$9,456,000**	

Total Cost **$ 9,456,000**

North Cascade Road





Project Elements

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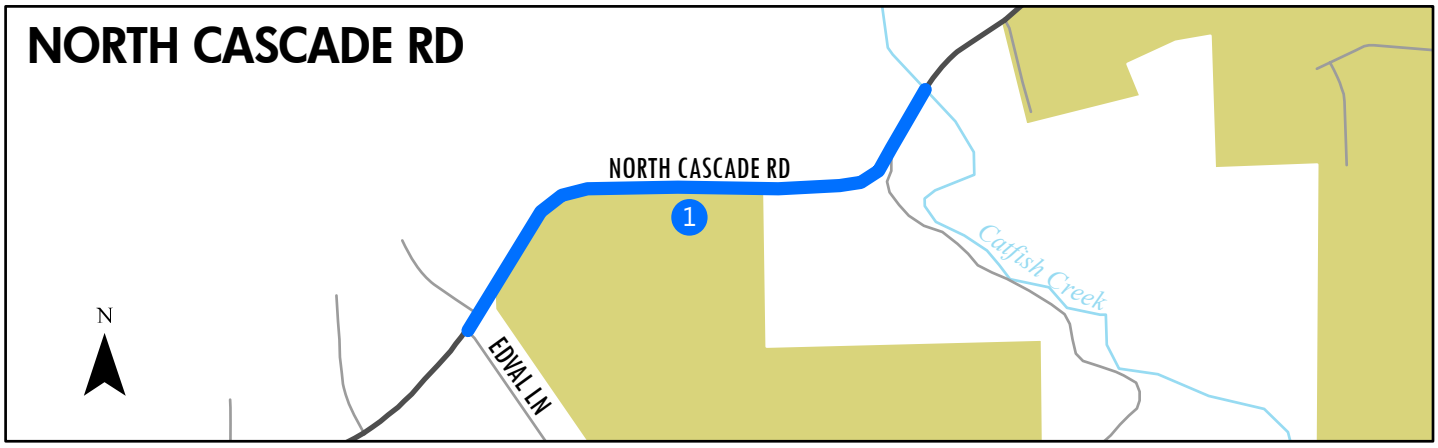
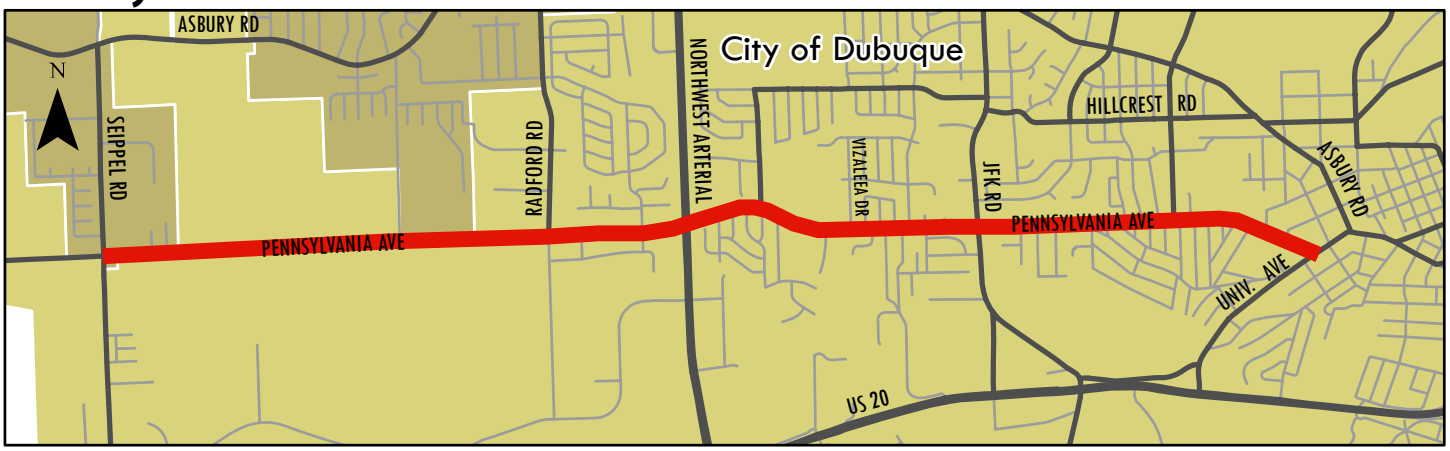


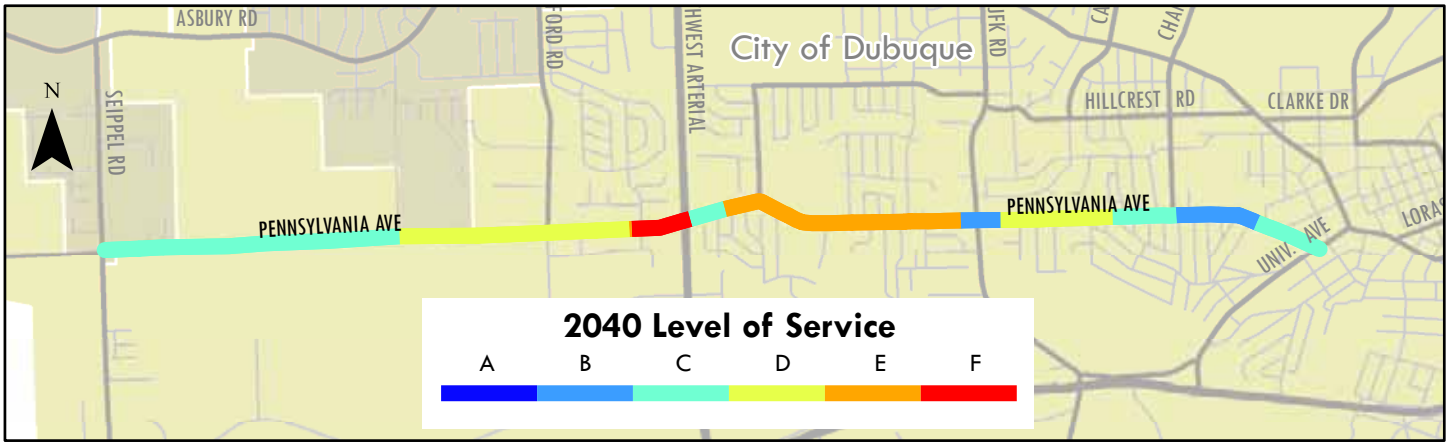
North Cascade Rd

Reconstruction								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	North Cascade Rd	Edval Ln	Catfish Creek Bridge	0.53	2	$1,750,000	$924,000	Reconstruct curves, widen pavement, add sidewalk
	Total						**$924,000**	
Right of Way								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of units***	***Cost per unit***	***Total Cost***	***Description of work***
	North Cascade Rd	Edval Ln	Catfish Creek Bridge	0.53	5	$30,000	$150,000	Reconstruct curves, widen pavement, add sidewalk
	Total						**$150,000**	

Total Cost **$1,074,000**

Pennsylvania Avenue





Project Elements

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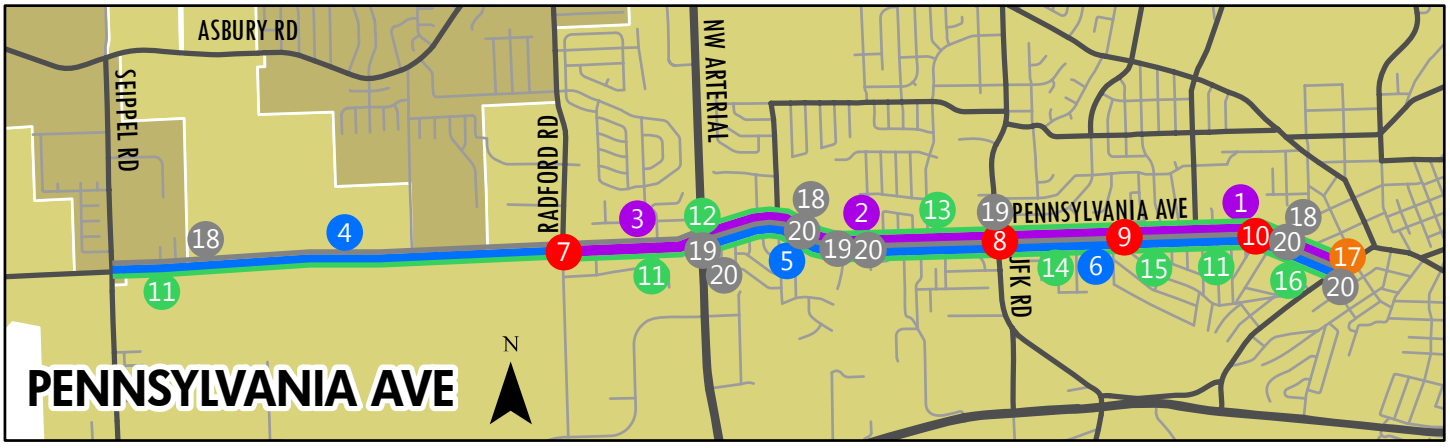


Pennsylvania Avenue

Resurfacing								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Pennsylvania Ave	University Ave	JFK Rd	1.17	3	$644,160	$2,261,002	HMA Resurfacing
2	Pennsylvania Ave	JFK Rd	NW Arterial	1.02	3	$644,160	$1,971,130	HMA Resurfacing
3	Pennsylvania Ave	NW Arterial	Radford Road	0.47	4	$644,160	$1,211,021	HMA Resurfacing
	Total						**$5,443,152**	

Reconstruction

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
4	Pennsylvania Ave	Radford Rd	Seippel Rd	1.52	3	$1,700,000	$7,752,000	Concrete reconstruction, watermain, sanitary, storm sewer
5	Pennsylvania Ave	NW Arterial	Vizaleea Dr	0.8	3	$3,500,000	$2,800,000	Reconstruct Pavement
6	Pennsylvania Ave	University Ave	NW Arterial	2.2	3	$1,700,000	$11,220,000	Concrete reconstruction, watermain, sanitary, storm sewer
			Total				**$21,772,000**	

Capacity Improvements (Intersection)

Project #	Description of Intersection	Length in Miles	Number of units	Cost per unit or mile	Total Cost	Description of work
7	Penn Ave and Radford Rd Roundabout				$700,000	Round-about
8	Penn Ave and JFK Rd Right Turn Lanes				$640,000	Right turn lanes added
9	Penn Ave and Van Buren St Intersection				$450,000	Intersection reconstruction
10	Penn Ave and Marmora Ave Intersection				$250,000	Intersection reconstruction
	Total				**$2,040,000**	

Bike & Pedestrian

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
11	Pennsylvania Ave	Seipple Rd	University Ave	2.66		$50,000	$133,000	Pavement Markings
12	Pennsylvania Ave	NW Arterial	Vizaleea Dr				$1,000,000	Pedestrain overpass
13	Pennsylvania Ave	Vizaleea Dr	JFK Road	0.44	2	$1,363,636	$600,000	Bike Lanes
14	Pennsylvania Ave	JFK Rd	Van Buren St	0.37	2	$1,054,054	$390,000	Bike Lanes
15	Pennsylvania Ave	Van Buren St	Wisconsin Ave	0.46	2	$2,717,391	$1,250,000	Bike Lanes
16	Pennsylvania Ave	Marmora Ave	University Ave	0.3	2	$1,500,000	$450,000	Bike Lanes
			Total				**$3,823,000**	

Safety & Security

Project #	Descriptionof Intersection	Length in Miles	Number of units	Cost per unit	Total Cost	Description of work
17	Pennsylvania Ave & University Ave		1	$30,000	$30,000	Spot Intersection Pavement marking
	Total				**$30,000**	

ITS improvements

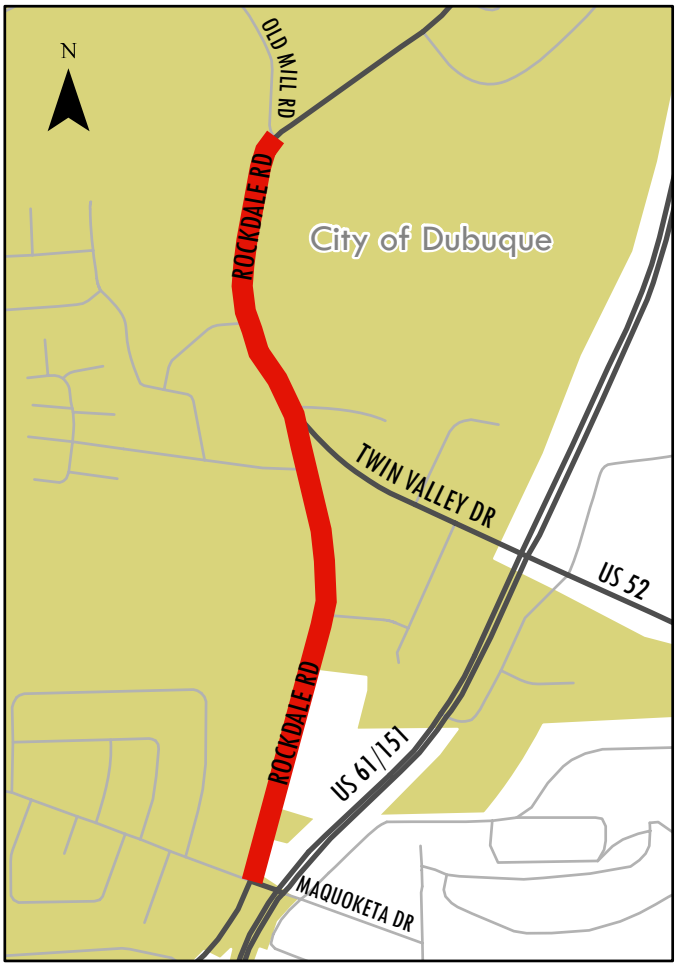
Project #	Road	From	To	Length in Miles	Number of units	Cost per unit or mile	Total Cost	Description of work
18	Pennsylvania Ave	University	Seippel	2.66		$150,000	$399,000	Fiber Optic conduit
19	Pennsylvania Ave	Seipple	University		3	$150,000	$450,000	Traffic Singnal replacement
20	Pennsylvania Ave	Seipple	University		5	$10,000	$50,000	Cameras
			Total				**$899,000**	

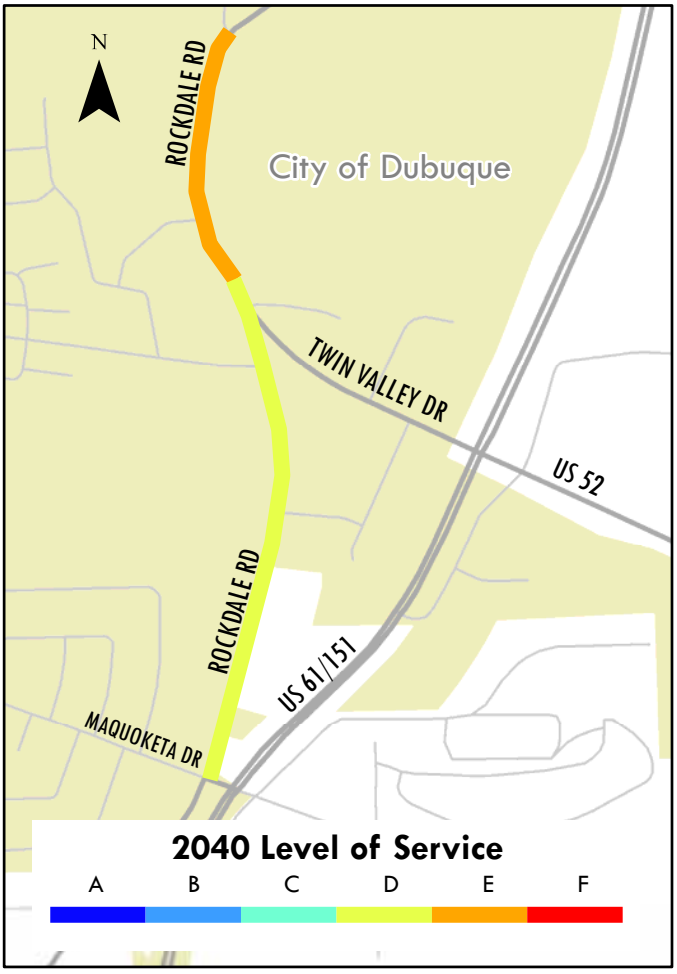
Right of Way

Project #	Description of Intersection	Length in Miles	Number of Sq Ft	Cost per Sq Ft	Total Cost	Description of work
	Penn Ave & JFK Rd intesection		6,450	$8.50	$54,825	Acquire Right of Way
	NW Arterial to Vizeleea Dr		7,577	$3.00	$22,731	Acquire Right of Way
	NW Arterial to Vizeleea Dr		17,222	$5.00	$86,110	Acquire Right of Way
	Penn Ave & Marmora Ave Intersection		312	$8.50	$2,652	Acquire Right of Way
	Vane Buren Ave to wisconsin Ave		5,725	$5.00	$28,625	Acquire Right of Way
	Mamora Ave to University Ave		7,960	$5.00	$39,800	Acquire Right of Way
	Radford Rd to Seipple (3.7 housing units)	1.52			$370,000	10' ROW on each side of road, assumed $100,000/acre
	Total				**$604,743**	

Total Cost **$34,611,895**

Rockdale Road





Project Elements

Numbers on map correspond with item numbers in the accompanying table

Rockdale Road

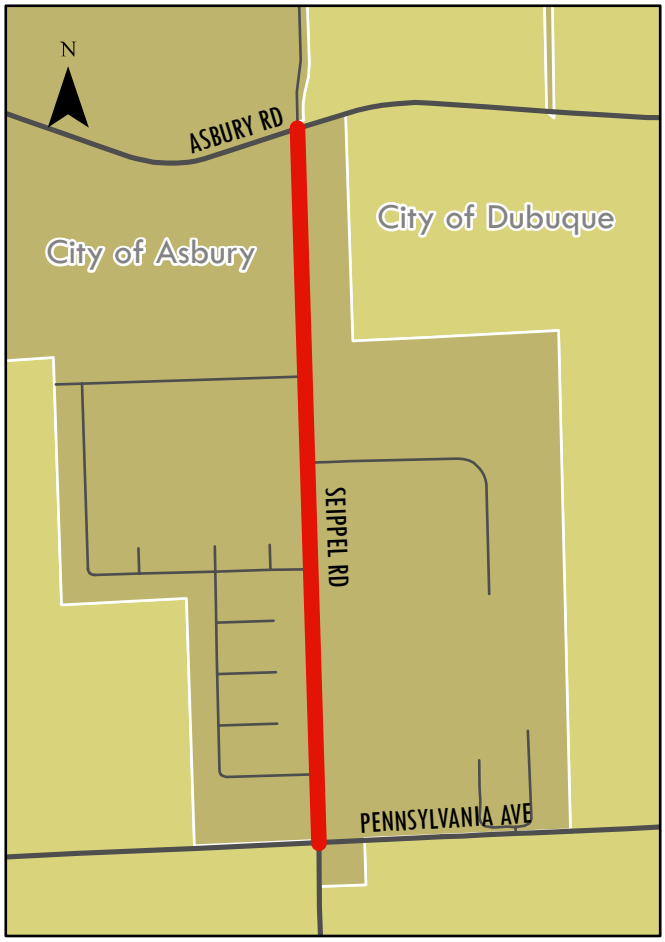
Reconstruction								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Rockdale Rd	Old Mill Rd	Maquoketa Dr	0.76	2	$3,289,473	$2,500,000	Street Reconstruction, Storm Sewer, Water Main, Sanitary Sewer, Sidewalks
	Total						**$ 2,500,000**	

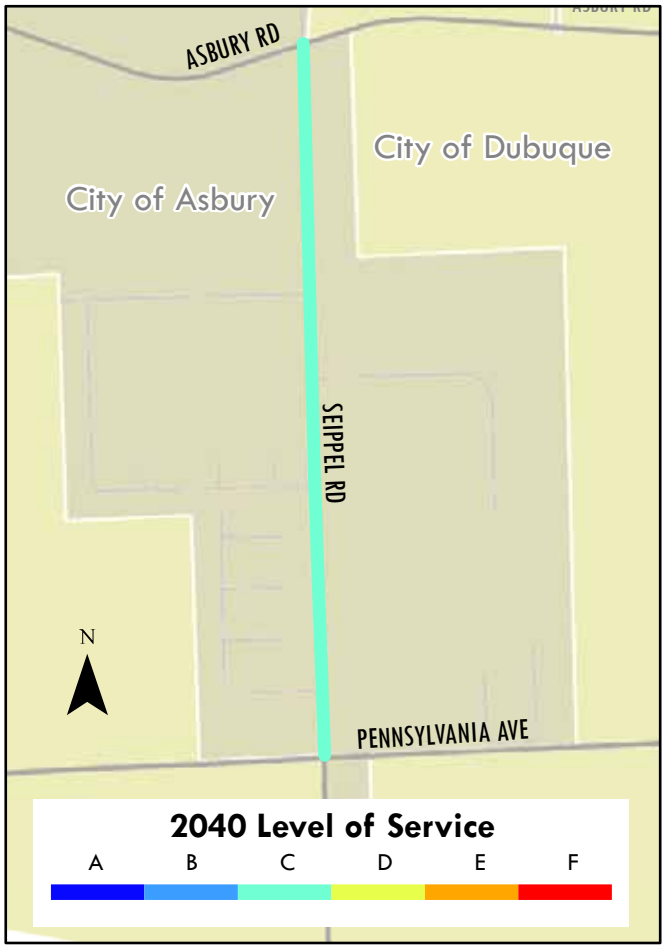
Bike & Pedestrian								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
2	Rockdale Rd	Old Mill Rd	Maquoketa Dr	0.76	2	$184,210	$140,000	Install sidewalks
3	Rockdale Rd	Old Mill Rd	Maquoketa Dr	0.25		$1,000,000	$250,000	Retaining Walls
	Total						**$ 390,000**	

Right of Way								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of units***	***Cost per unit***	***Total Cost***	***Description of work***
	Rockdale Rd	Old Mill Rd	Maquoketa Dr	0.76	8	$160,000	$1,280,000	ROW Acquisition
	Total						**$ 1,280,000**	

Total Cost **$4,170,000**

Seippel Road





Project Elements

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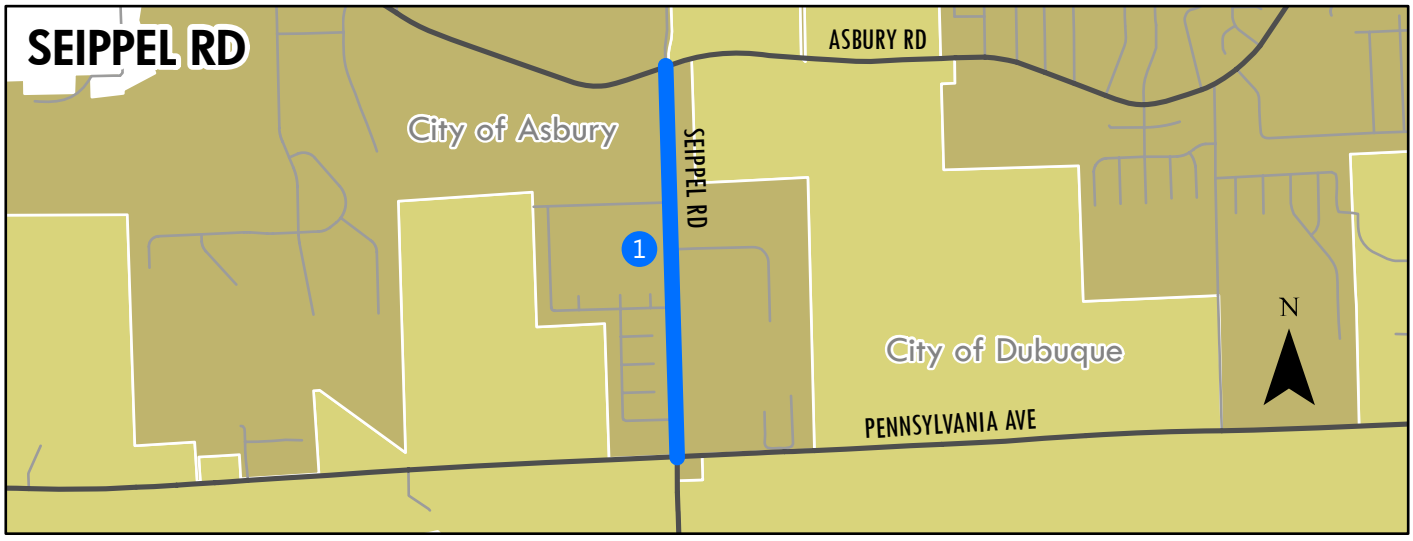
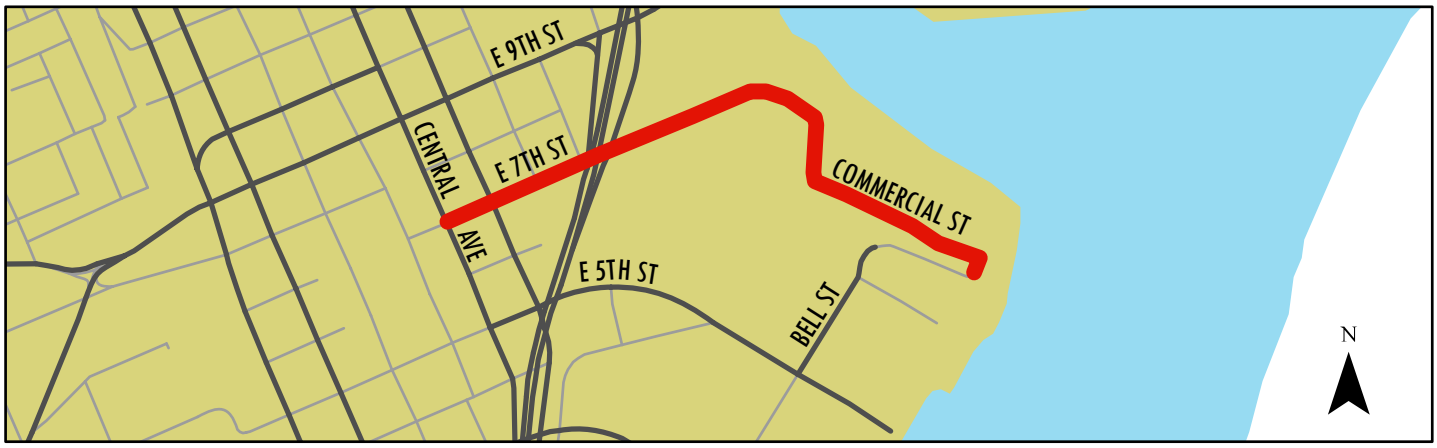


Seippel Road

Reconstruction								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Seippel Rd	Asbury Rd	Middle Rd	0.72	2	$1,750,000	$2,664,000	Pavement rehab and, widen pavement.
	Total						**$2,664,000**	

Total Cost $ 2,664,000

Seventh Street



Project Elements

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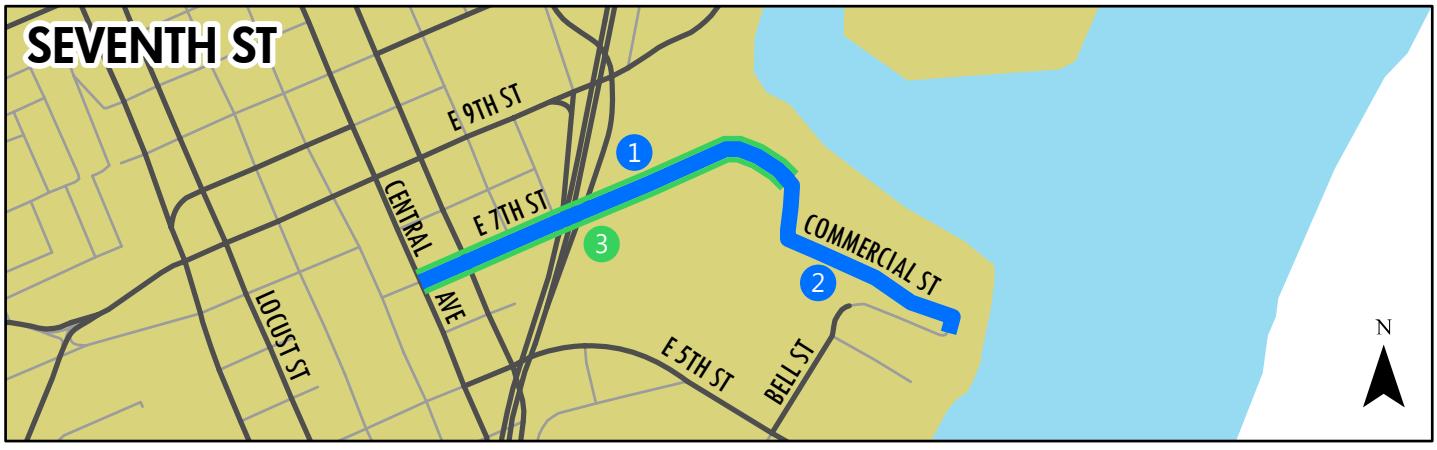
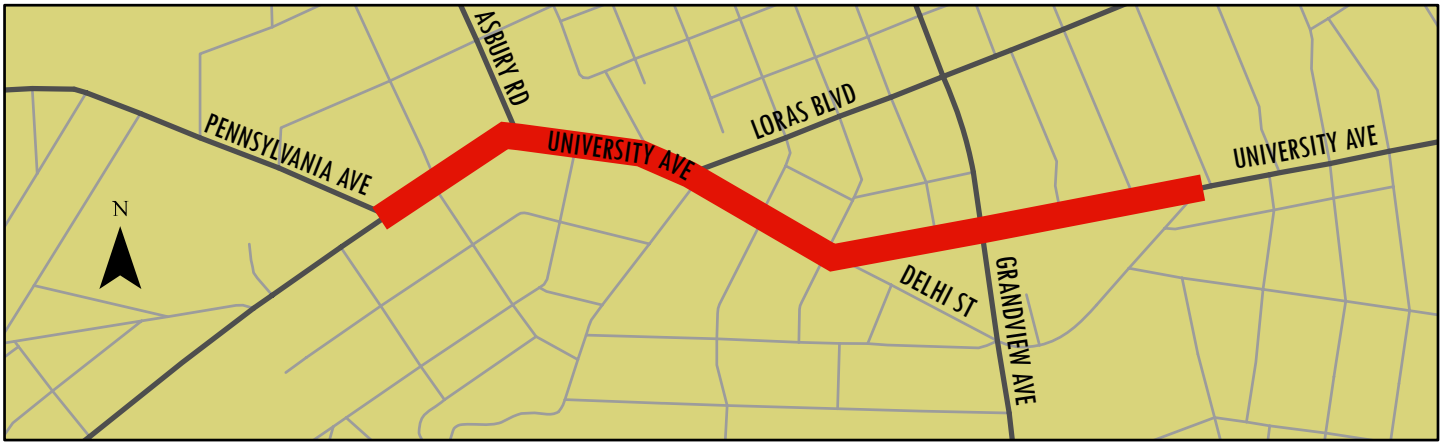


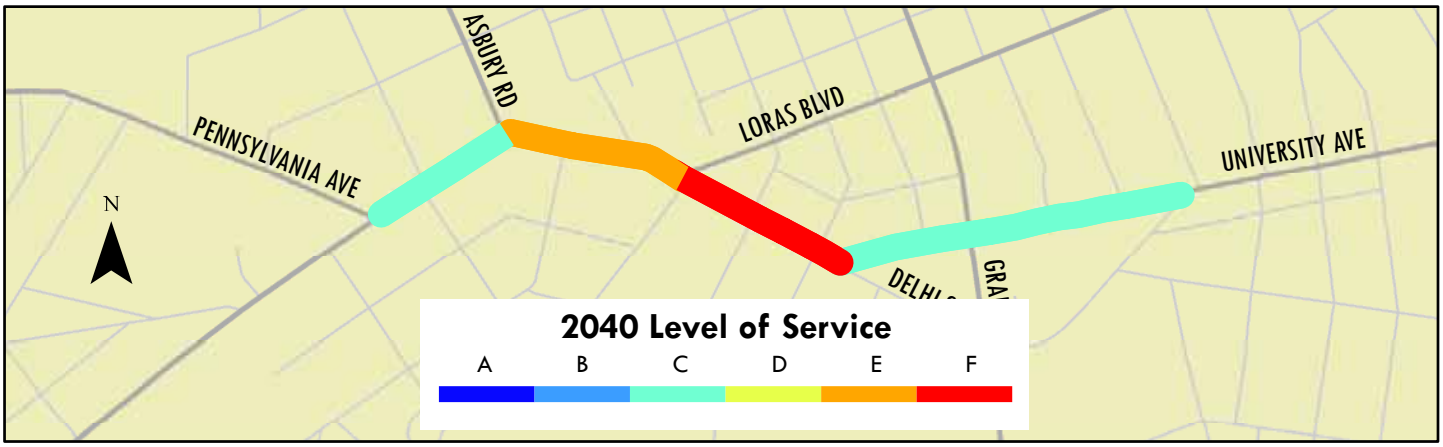
Seventh Street

Reconstruction								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	E 7th St	Central Ave	Commercial St	0.5	2	$4,000,000	$2,000,000	PCC Street Reconstruction, Sanitary Sewer, Water Main
2	Commercial St	E 7th St	Star Brewery Dr	0.27	15,000	$20.00	$300,000	Railroad Purchase
			Total				**$2,300,000**	
Bike & Pedestrian								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
3	E 7th St	Central Ave	Commercial St	0.5	NA	$200,000	$100,000	Sidewalk Installation
			Total				**$100,000**	

Total Cost **$2,400,000**

University Avenue





Project Elements

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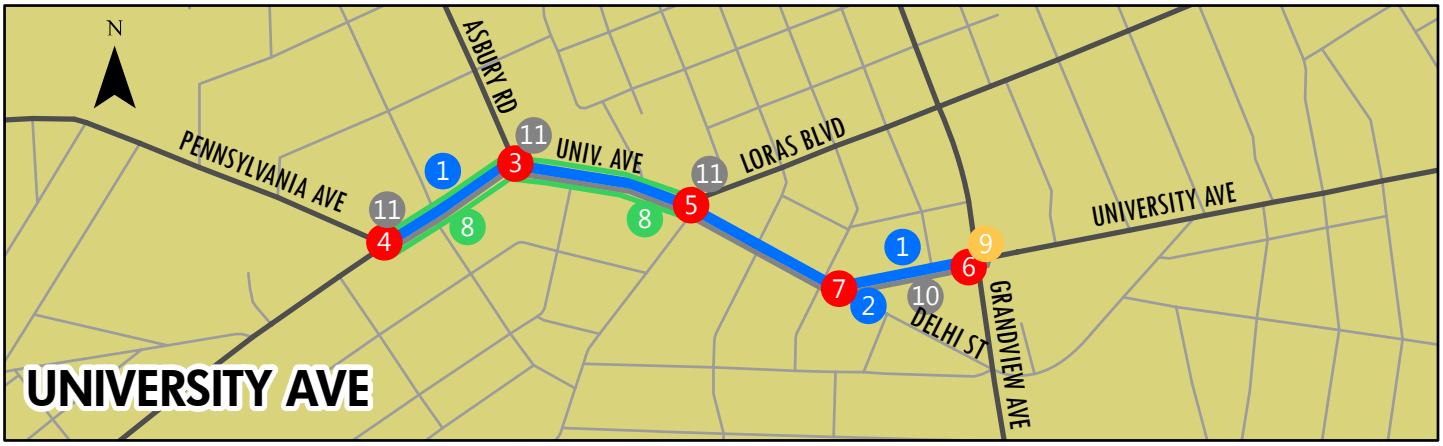


University Avenue

Reconstruction

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
1	University Ave	Overlap reconstruction					$2,380,000	Reconstruct pavement, new utilities
2	University Ave	Delhi St					$290,000	Realignment
			Total				**$2,670,000**	

Capacity Improvements (Intersection)

Project #	Description of Intersection	Length in Miles	Number of units	Cost per unit or mile	Total Cost	Description of work
3	University Ave & Asbury Rd		1		$1,800,000	Roundabout
4	University Ave & Penn Ave		1		$1,800,000	Roundabout
5	University Ave & Loras Blvd		1		$1,800,000	Roundabout
6	Grandview Ave & University Ave		1		$190,000	Intersection improvements
7	Delhi St & University Ave		1		$510,000	Intersection improvements
	Total				**$6,100,000**	

Bike & Pedestrian

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
8	University Ave	Pennsylvania Ave	Loras Blvd				$32,000	Sharrows
			Total				**$32,000**	

Safety & Security

Project #	Description	Length in Miles	Number of units	Cost per unit	Total Cost	Description of work
9	University Ave & Grandview Ave		1	$10,000	$10,000	Spot Intersection pavement marking
	Total				**$10,000**	

ITS improvements

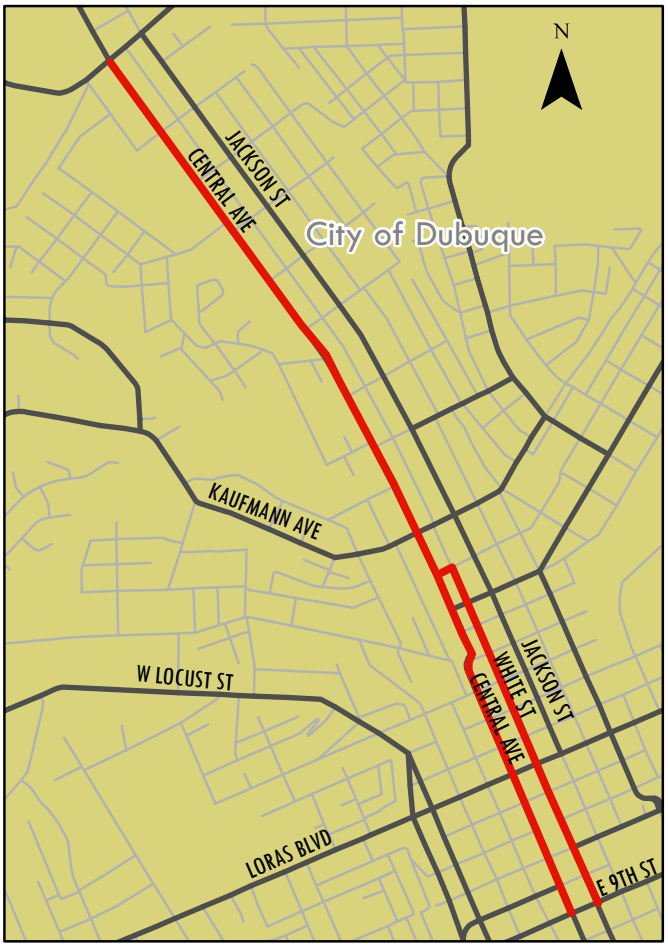
Project #	Road	From	To	Length in Miles	Number of units	Cost per unit or mile	Total Cost	Description of work
10	University Ave	Asbury Rd	Delhi St	0.48		$150,000	$72,000	Fiber Optic conduit
11	University Ave	Overlap reconstruction			12	$10,000	$120,000	Cameras
			Total				**$192,000**	

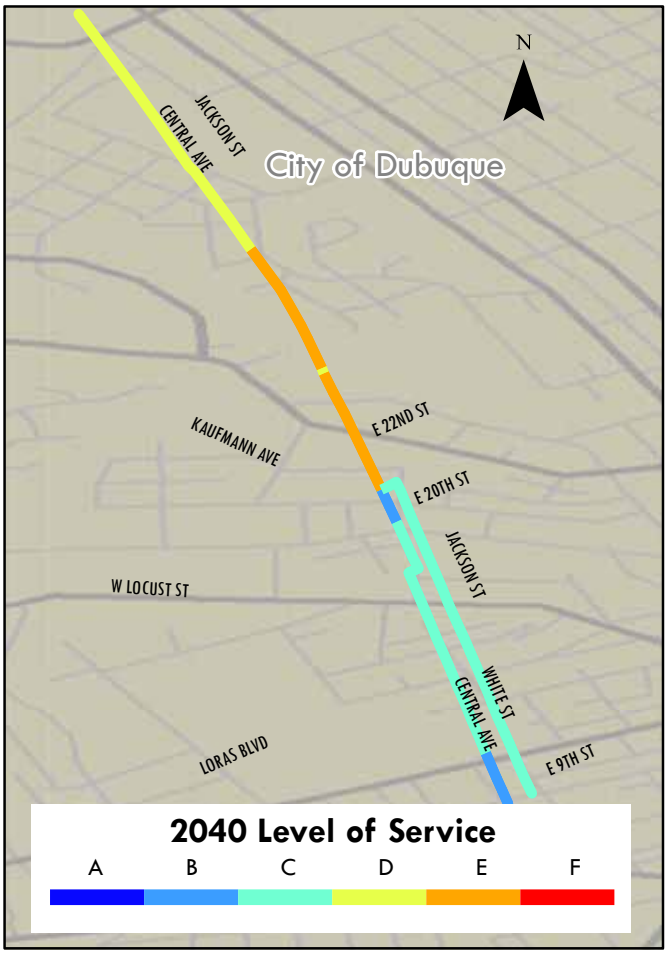
Right of Way

Project #	Road	From	To	Length in Miles	Number of Sq Ft	Cost per Sq Ft	Total Cost	Description of work
	University Ave	Overlap reconstruction			3,985	$3.00	$11,955	Acquire Right of Way
	University Ave	Overlap reconstruction			37,441	$8.50	$318,249	Acquire Right of Way
	University Ave	Overlap reconstruction					$2,198,325	Full impact properties
	Delhi St	Realignment					$160,800	Full impact properties
			Total				**$2,689,329**	

Total Cost **$11,693,329**

US 52 - Central Avenue & White Street





Project Elements

Numbers on map correspond with item numbers in the accompanying table

US 52 Central Avenue & White Street

Resurfacing								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Central Ave	9th St	21st St	0.74	4	$1,600,000	$1,200,000	Resurfacing of Central Ave Pavement, 4" of HMA.
3	White St	11th St	21st St	0.63	4	$1,500,000	$943,000	Resurfacing of White Street Pavement, 4" of HMA.
	Total						**$2,143,000**	

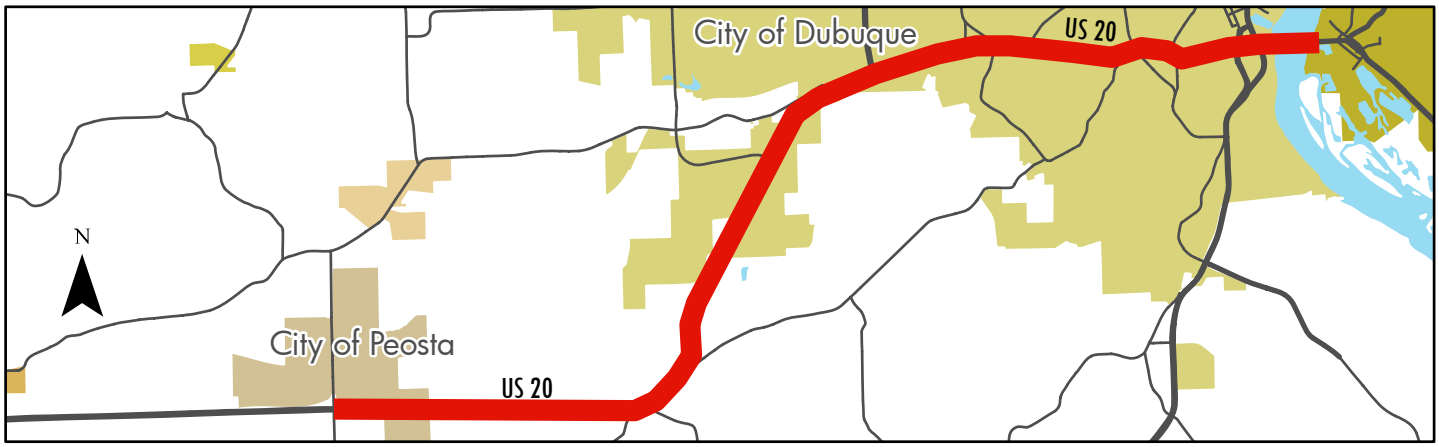
Bike & Pedestrian						
Project #	***Description of Intersection***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
4	White St & 32nd St				$5,000	Ped Signals
	Total				**$5,000**	

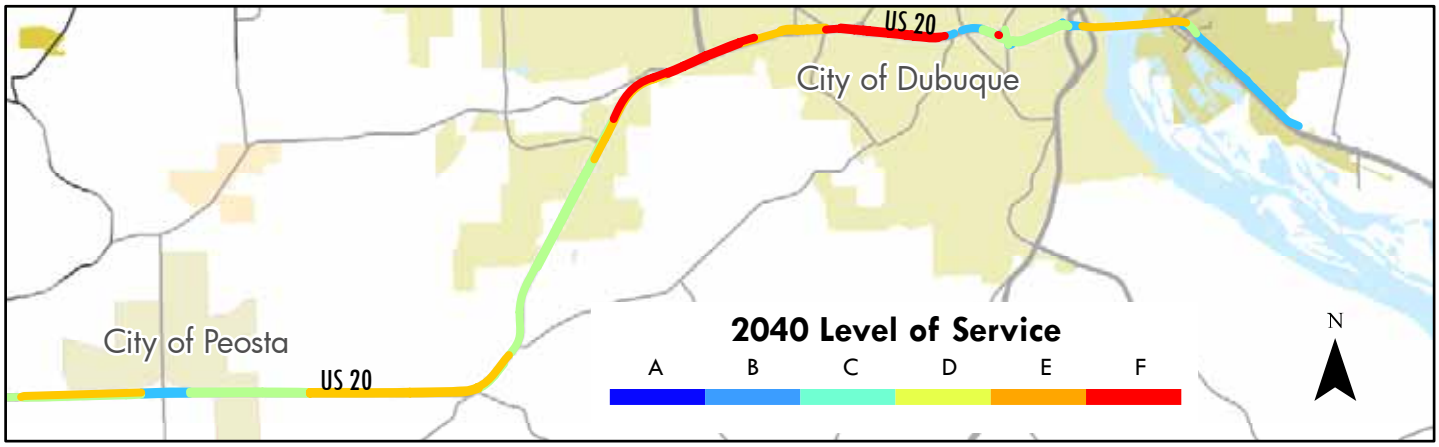
Safety & Security						
Project #	***Description of Intersection***	***Length in Miles***	***Number of units***	***Cost per unit***	***Total Cost***	***Description of work***
5	White St & 32nd St				$10,000	New Street lights
	Total				**$10,000**	

ITS improvements								
Project #	***Description of Intersection***			***Length in Miles***	***Number of units***	***Cost per unit or mile***	***Total Cost***	***Description of work***
2	24th St	Central Ave	Jackson St	0.12			$25,000	Fiber
6	White St & 32nd St						$100,000	Signal Reconstruction
							$30,000	Cameras / Network / Fiber
	Total						**$155,000**	

Total Cost **$2,313,000**

US Highway 20





Project Elements

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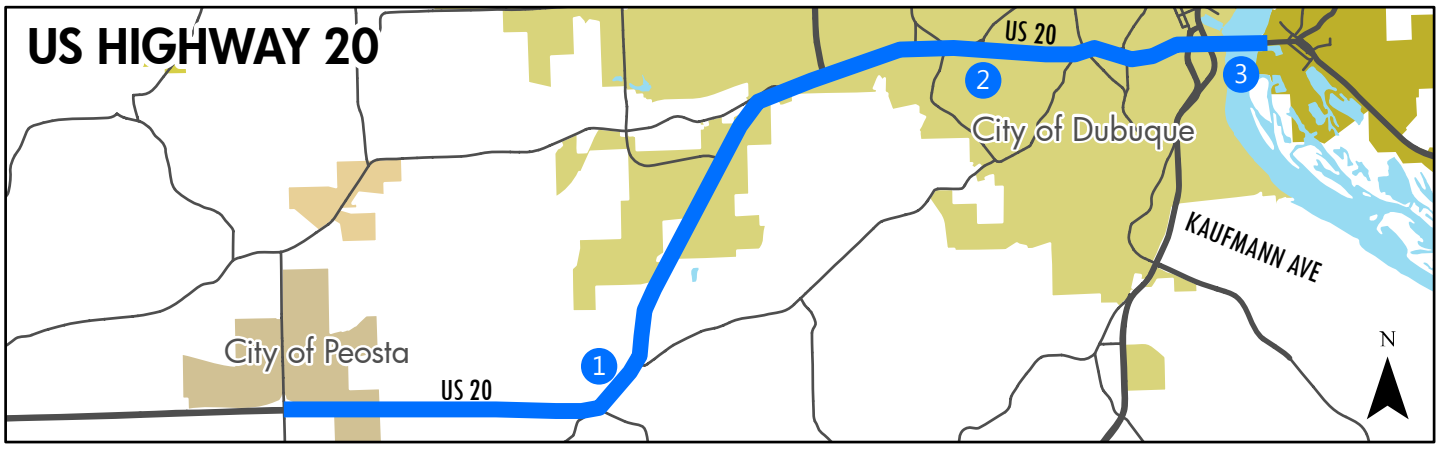
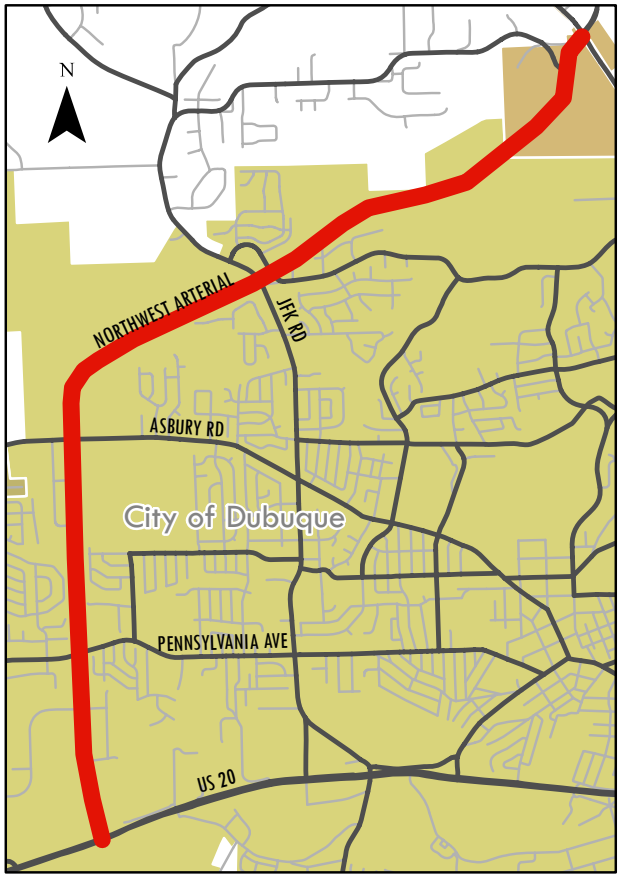


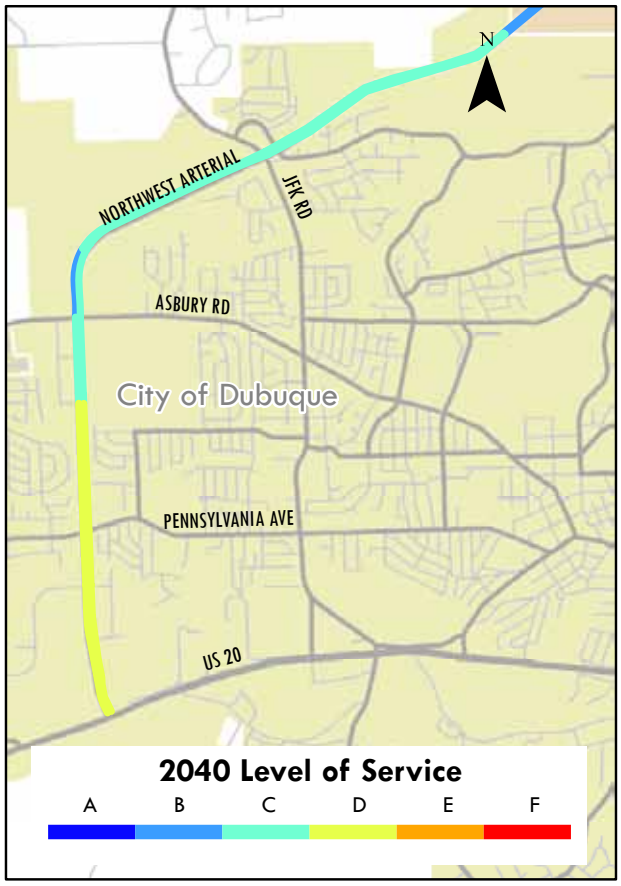
US Highway 20

Reconstruction								
Project #	***Road***	***From***	***To***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	US 20	Peosta Interchange	IA 32 NW Arterial	7.6	4		$72,000,000	Thunder Hills Rd interchange, relocation of westbound lanes in North Cascade Rd and Swiss Valley Rd Area, interchange at Swiss Valley Rd, Seipple Rd interchange, upgrage Old Hwy Rd and IA 32/NW Arterial Intersection
2	US 20	IA 23 NW Arterial	Devon Dr	2	4		$ 60,000,000	Full access controled
							$ 180,000,000	signalized arterial
3	US 20 Julian Dubuque Bridge Replacement			1			$ 194,400,000	
	Total						**$506,400,000**	

Total Cost **$506,400,000**

NW Arterial





Project Elements

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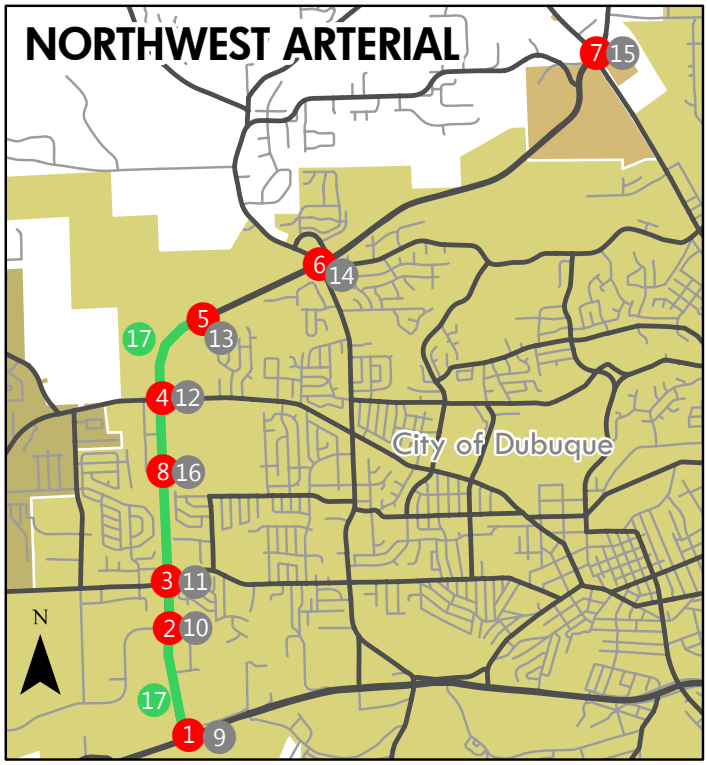


NW Arterial

Capacity Improvements (Intersection)

Project #	*Description of Intersection*	*Length in Miles*	*Number of units*	*Cost per unit or mile*	*Total Cost*	*Description of work*
1	NW Arterial & US 20				$ 39,046,170	Lengthen both the eastbound left-turn and the westbound right-turn lanes. Reconstruct northbound lanes to include two through lanes and construct third southbound left-turn lane, dual eastbound left-turn lanes and dual southbound right-turn lanes. Construct third lane northbound and southbound between US 20 and Plaza Dr.
2	NW Arterial & Chavenelle Rd				$ 3,120,990	Lengthen northbound left-turn lane. Extend existing paved shoulder. Lengthen northbound and southbound left-turn lanes. Reconstruct southbound and northbound right-turn lanes.
3	NW Arterial & Pennsylvania Ave				$ 5,179,072	Lengthen northbound and southbound left-turn lanes and construct southbound right-turn lane. Extend existing paved shoulder. Reconstruct southbound lanes and construct dual northbound and southbound left-turn lanes. Reconstruct southbound lanes and construct dual northbound and southbound left-turn lanes.
4	NW Arterial & Asbury Rd				$ 2,164,770	Lengthen northbound left-turn lane. Extend existing paved shoulder. Construct southbound right-turn lane. Reconstruct southbound lanes and construct dual northbound and southbound left-turn lanes. Reconstruct northbound and southbound right-turn lanes.
5	NW Arterial & Plaza Dr				$ 2,865,268	Construction of a paved shoulder between the new southbound left-turn lane and the existing northbound lanes. Construct northbound dual left-turn lanes. Reconstruct northbound and southbound right-turn lanes.
6	NW Arterial & JFK				$ 326,374	Lengthen northbound left-turn lane, construct dedicated northbound, southbound and right-turn lanes. Extend of the existing paved shoulder adjacent to the southbound lanes of NW Arterial.
7	NW Arterial & US 52				$ 75,940	Lengthen northbound left-turn lane. Extend the existing paved median.
8	NW Arterial & Holliday Dr				$ 2,367,176	Construct northbound and southbound right-turn lanes.
	Total				**$55,145,760**	

NW Arterial (Cont.)

ITS Improvements (Intersection)

Project #	Description of Intersection	Length in Miles	Number of units	Cost per unit or mile	Total Cost	Description of work
9	NW Arterial & US 20		1	$ 24,000	$ 24,000	Video Monitors
9	NW Arterial & US 20		1	$ 48,000	$ 48,000	Signal Communication
9	NW Arterial & US 20		1	$ 252,000	$ 252,000	Full Signal Rebuild (Truss)
10	NW Arterial & Chavenelle Rd		2	$ 12,000	$ 24,000	Signal w/Mast Arm
10	NW Arterial & Chavenelle Rd		1	$ 36,000	$ 36,000	Video Detection
10	NW Arterial & Chavenelle Rd		1	$ 48,000	$ 48,000	Signal Communications
10	NW Arterial & Chavenelle Rd		1	$ 210,000	$ 210,000	Full Signal Rebuild (Mast-Arms)
11	NW Arterial & Pennsylvania Ave		1	$ 12,000	$ 12,000	Signal w/Mast Arm
11	NW Arterial & Pennsylvania Ave		1	$ 36,000	$ 36,000	Video Detection
11	NW Arterial & Pennsylvania Ave		1	$ 24,000	$ 24,000	Video Monitors
11	NW Arterial & Pennsylvania Ave		1	$ 48,000	$ 48,000	Signal Communications
11	NW Arterial & Pennsylvania Ave		1	$ 210,000	$ 210,000	Full Signal Rebuild (Mast-Arms)
12	NW Arterial & Asbury Rd		1	$ 36,000	$ 36,000	Video Detection
12	NW Arterial & Asbury Rd		1	$ 24,000	$ 24,000	Video Monitors
12	NW Arterial & Asbury Rd		1	$ 210,000	$ 210,000	Full Signal Rebuild (Mast-Arms)
13	NW Arterial & Plaza Dr		1	$ 48,000	$ 48,000	Signal Communication
13	NW Arterial & Plaza Dr		1	$ 210,000	$ 210,000	Full Signal Rebuild (Mast-Arms)
14	NW Arterial & JFK		1	$ 24,000	$ 24,000	Video Monitors
15	NW Arterial & US 52		1	$ 24,000	$ 24,000	Video Monitors
16	NW Arterial & Holliday Dr		1	$ 210,000	$ 210,000	Full Signal Rebuild (Mast-Arms)
	Total				**$1,758,000**	

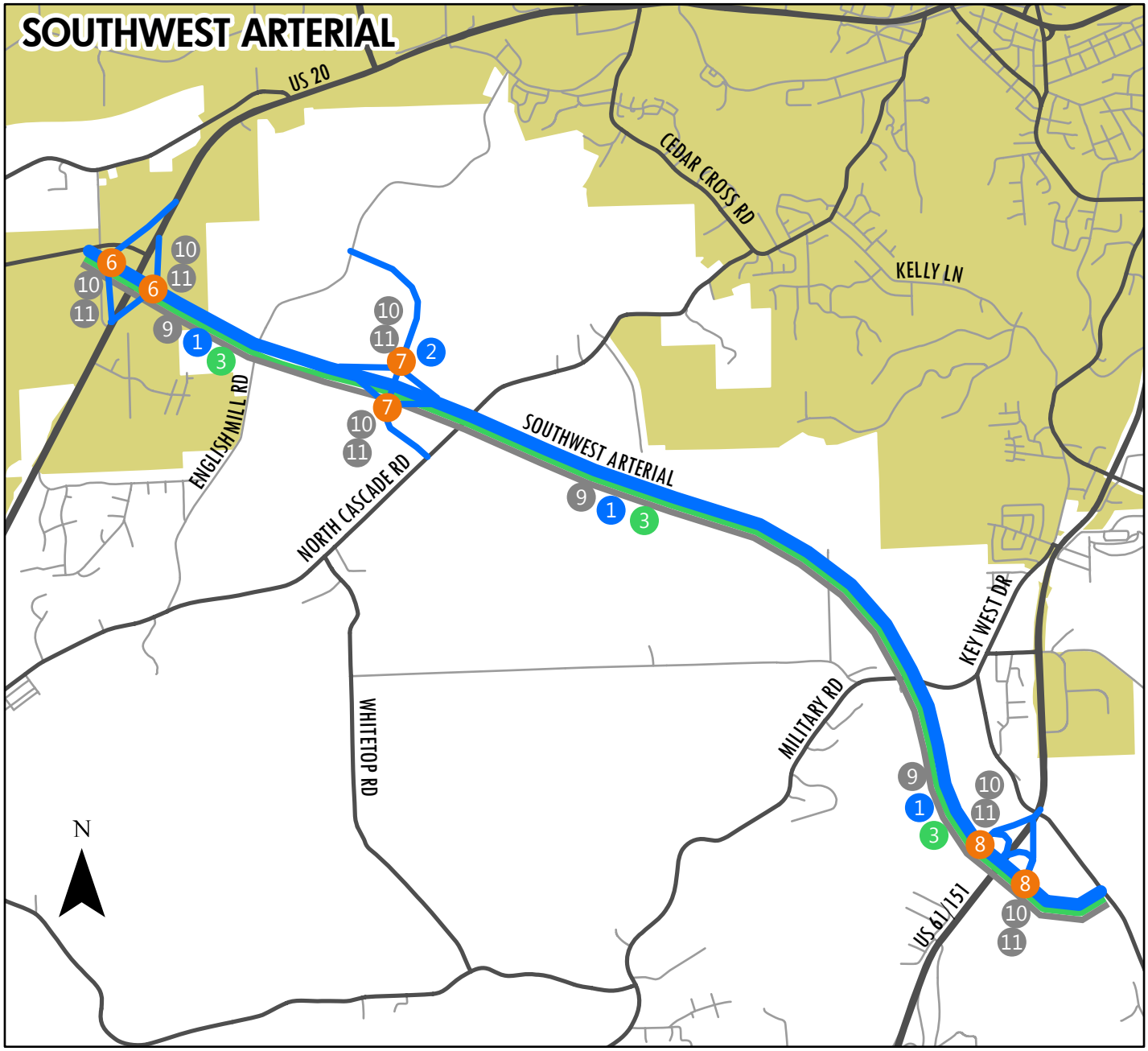
Bike & Pedestrian

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
17	NW Arterial	Peyton	US Hwy 20	1.7	NA	$ 370,000	$ 630,000	Construct a 10' wide hike/bike trail along the western side of the NW Arterial
	Total						**$630,000**	

Total Cost **$ 57,533,760**

Project Elements

Numbers on map correspond with item numbers in the accompanying table



SW Arterial

Design

Project #	Description of Intersection	Length in Miles	Number of units	Cost per unit or mile	Total Cost	Description of work
	Final Engineering Design				$8,000,000	
	Mitigation				$2,000,000	
	Total				**$10,000,000**	

Construction

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
1	SW Arterial	US 20/Seippel Rd	US 61/151	6.1	2	$6,006,393	$73,278,000	Grade (4-Lane, Hwy 61/151-HWY Pave 2-Lanes (Hwy 61/151-HWY 20),Partial interchange (HWY 20 & 151/61), Temp At-Grade Intersect (N.Cascade)
2	SW Arterial	US 20/Seippel Rd	US 61/151	6.1	4	$930,328	$22,700,000	Pave 2-Lanes, Interchange at N.Ca
	Total						**$95,978,000**	

Bike & Pedestrian

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
5	SW Arterial	US 20/Seippel Rd	US 61/151	6.1		$327,869	$2,000,000	Bike Trail
	Total						**$2,000,000**	

Safety & Security

Project #	Road	From	To	Length in Miles	Number of units	Cost per unit	Total Cost	Description of work
6	SW Arterial	US 20 Interchange			2	$1,000,000	$2,000,000	Roundabouts
7	SW Arterial	N.Cascade Interchange			2	$1,000,000	$2,000,000	Roundabouts
8	SW Arterial	US 61/151 Interchange			2	$1,000,000	$2,000,000	Roundabouts
	Total						**$6,000,000**	

ITS improvements

Project #	Road	From	To	Length in Miles	Number of units	Cost per unit or mile	Total Cost	Description of work
9	SW Arterial	US 20	US 61/151	6.1		$80,000	$488,000	Fiber Optic
10	SW Arterial	US 20	US 61/151		24	$6,000	$144,000	Cameras
11	SW Arterial	US 20	US 61/151		6	$15,000	$90,000	Microwave Sensors
	Total						**$722,000**	

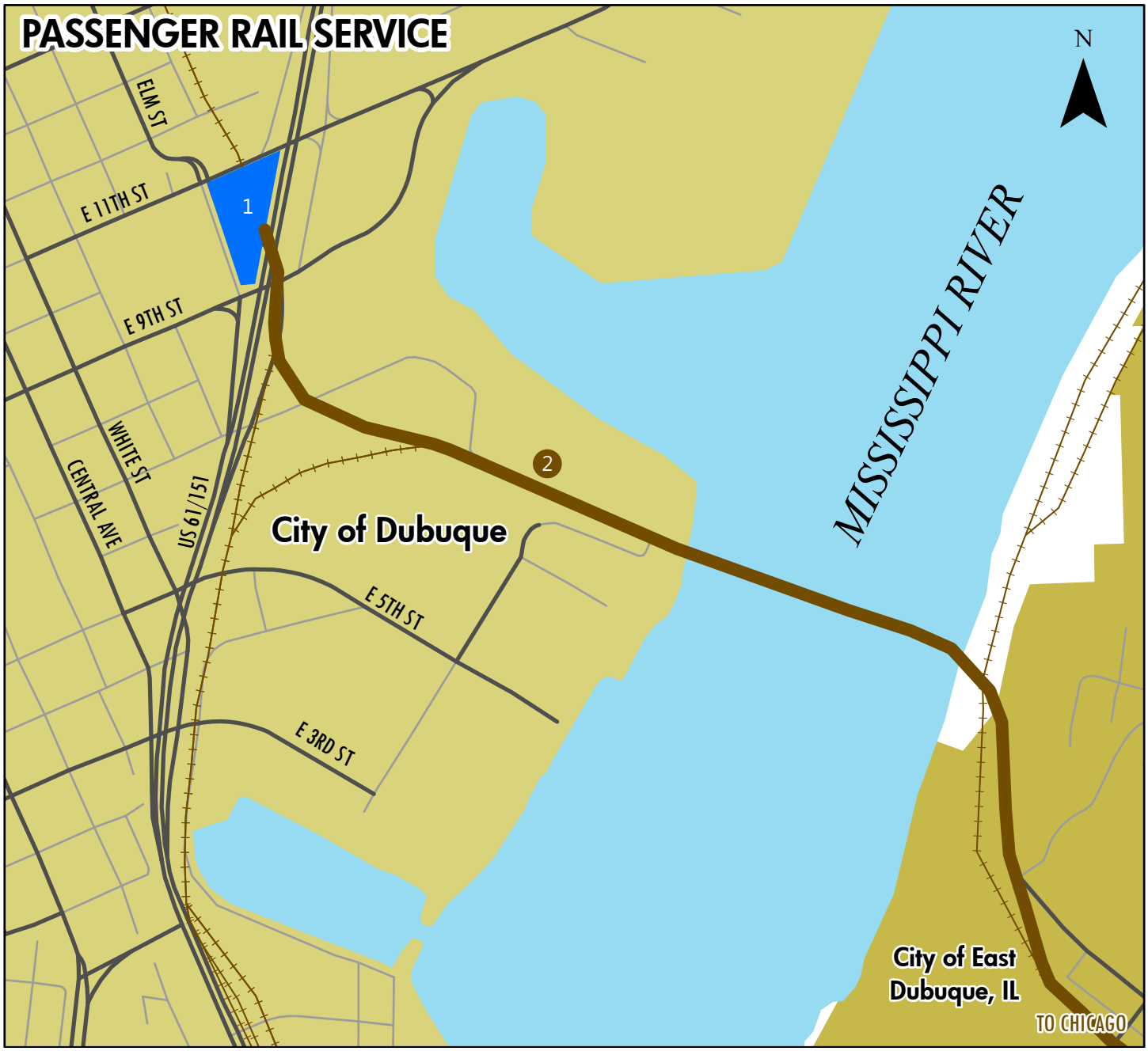
Right of Way

Project #	Description of Intersection	Length in Miles	Number of Lanes	Cost per miles	Total Cost	Description of work
	Poperty Acquisition (4-Lane, Hwy 20 - Hwy 61/151)				$9,800,000	Acquire Right of Way
	Land Acquisition Services				$330,000	Acquire Right of Way
	Total				**$10,130,000**	

Total Cost **$124,830,000**

Project Elements

Numbers on map correspond with item numbers in the accompanying table



Passenger Rail Service

Intermodal Facility Construction								
Project #	*Road*	*From*	*To*	*Length in Miles*	*Number of units*	*Cost per unit*	*Total Cost*	*Description of work*
1							$20,000,000	Construction of Intermodal Facility
	Total						**$20,000,000**	
Track Upgrades								
Project #	*Road*	*From*	*To*	*Length in Miles*	*Number of Lanes*	*Cost per mile*	*Total Cost*	*Description of work*
2				1			$2,200,000	Track Upgrades
	Total						**$2,200,000**	

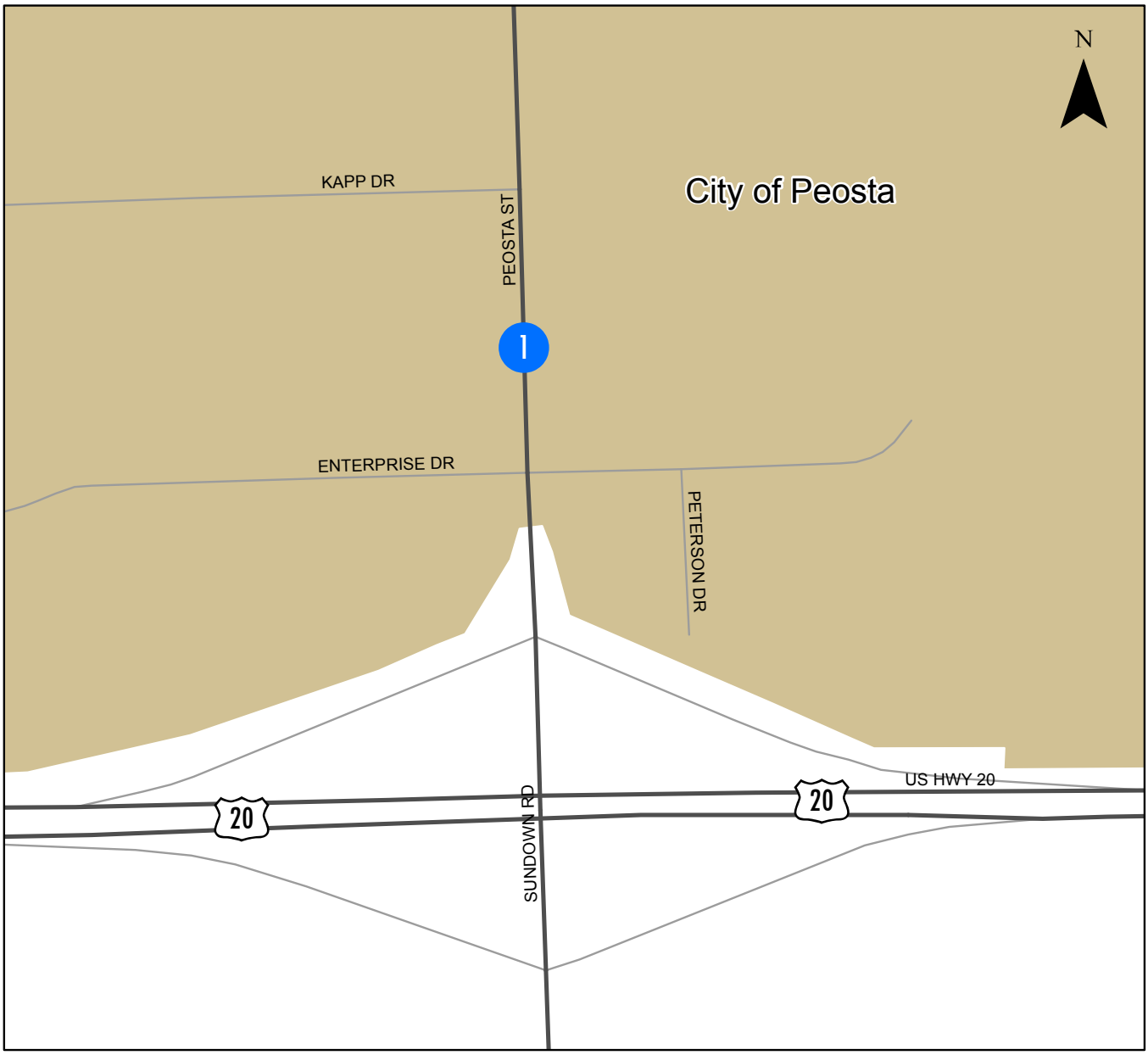
Total Cost **$22,200,000**

Peosta Roundabout

Construction						
Project #	***Description of Intersection***	***Length in Miles***	***Number of Lanes***	***Cost per mile***	***Total Cost***	***Description of work***
1	Between Kapp Dr and Enterprise Dr				$447,660	Construct a roundabout to accommodate NICC traffic and future development in the area.
	Total				**$447,660**	

Project Elements

Numbers on map correspond with item numbers in the accompanying table



Illinois Projects

Project Name: US 20 and Barge Terminal Rd

Construction

Project #	Road	Description of Intersection	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
1	US 20	US 20 and Barge Terminal Rd				$500,000	Construct acceleration and deceleration lanes on US 20 at Barge Terminal RD intersection
	Total					**$500,000**	

Total Cost **$** **500,000**

Project Name: Menominee Ave

Resurfacing

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
2	Menominee Ave	2nd St	6th St	0.31	2	$1,500,000	$465,000	Resurfacing
	Total						**$465,000**	

Total Cost **$465,000**

Project Name: Illinois 35

Resurfacing

Project #	Road	From	To	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
3	Illinois 35	Sinsinawa Ave	Cherry Ln	0.16	2		$35,000	Resurfacing
	Total						**$35,000**	

Safety & Security

Project #	Description of Intersection	Length in Miles	Number of units	Cost per unit	Total Cost	Description of work
4	Illinois 35 and Park Lane Dr				$175,000	Traffic Signal
	Total				**$175,000**	

Total Cost **$210,000**

Project Name: Frentress Lake Rd Rail Overpass

Design

Project #	Description of Intersection	Length in Miles	Number of units	Cost per unit or mile	Total Cost	Description of work
	Final Engineering Design				$100,000	
	Total				**$100,000**	

Total Cost **$100,000**

Construction

Project #	Road	Description of Intersection	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
5	Frentress Lake Rd	Rail Crossing				$1,500,000	Construct overpass over CN and BNSF Rail lines.
	Total					**$1,500,000**	

Total Cost **$1,600,000**

Project Name: US Highway 20 Bridge

Construction

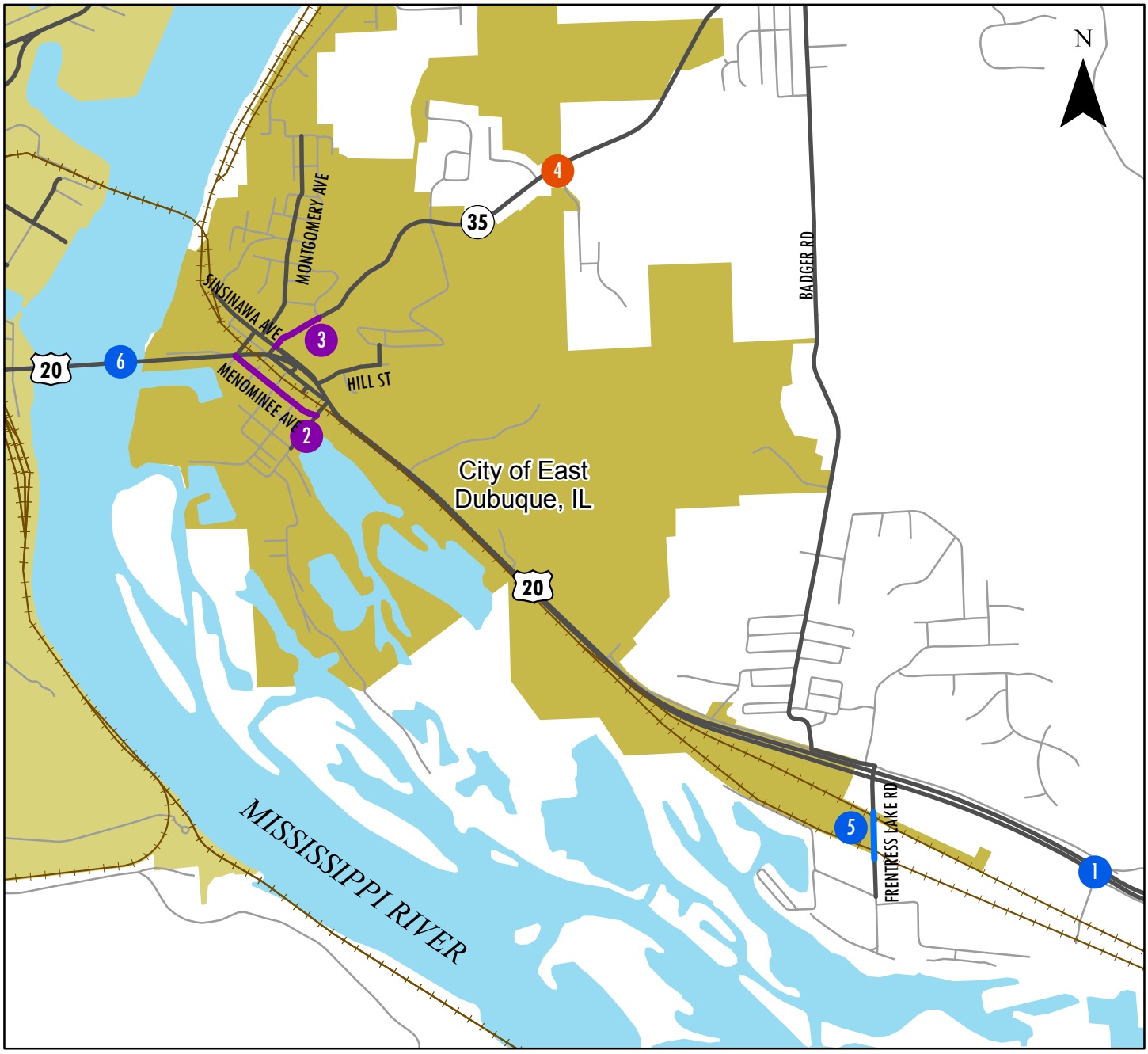
Project #	Road	Description of Intersection	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
6	US Hwy 20					$194,400,000	US 20 Julian Dubuque Bridge Replacement
	Total					**$194,400,000**	

Construction

Project #	Road	Description of Intersection	Length in Miles	Number of Lanes	Cost per mile	Total Cost	Description of work
6	US Hwy 20	At Menominee River				$1,690,000	Replace Bridge Deck
	Total					**$1,690,000**	

Project Elements

Numbers on map correspond with project numbers in the accompanying table



Chapter 8: Environmental

Traditionally, long range transportation plans (LRTP) did not include an environmental analysis. Traditional transportation plans had a long-range, system-wide focus, and the projects proposed in the plan were not sufficiently specific in either concept or location to allow for an environmental assessment. As a result, local decision makers, and the public, did not know the severity of environmental impacts until the proposed project moved into the development phase. Over time, transportation planners came to view the lack of environmental analysis as a drawback to the traditional planning process, because it required the public and elected officials to prioritize proposed projects without information on the potential environmental impacts. To correct this lack of information, DMATS began implementing preliminary environmental impact screening and systems level impact screening as part of the LRTP.

Preliminary Environmental Impact

A preliminary environmental impact screening can identify potentially serious impacts that could delay or completely shut down a project. Identifying such issues in the early planning stages provides local governments with the opportunity to avoid or mitigate undesirable environmental impacts through modification or elimination of the project. Early "fatal flaw" analysis of this type helps reduce the possibility that subsequent, more detailed analyses will uncover unexpectedly serious environmental impacts. This approach helps reduce the risks that are inherent in transportation planning process, and helps ensure that local governments do not waste time and resources unnecessarily.

Systems-Level Environmental Screening

A systems-level environmental screening allows transportation planners to consider the interactions between two or more transportation projects. The transportation system is an interconnected network, and as a result, the environmental impacts of transportation projects are also interconnected. In many cases, the combined environmental impacts of several projects can add up to more than the sum of each project's individual impacts. Similarly, modification or elimination of one project due to environmental considerations can significantly alter the performance of other projects. It is important to be able to assess the environmental impacts of a project in the context of the entire LRTP.

Although system-level environmental screening does not substitute for detailed, project-specific review, this assessment can identify issues that require further analysis. This knowledge not only reduces the likelihood of unexpected environmental impacts, but it also allows future environmental studies to focus on the most critical issues. The result is a transportation plan that minimizes negative impacts on the natural and manmade environments, and is ultimately more efficient, timely, and cost-effective.

Environmental Impacts by Mode

This environmental screening process and its results reflect the reality that the majority of the recommended LRTP's environmental impacts are associated with roadway projects. Environmental screening is extremely important for road way projects because, once a few critical decisions are made, constraints on roadway cross sections and alignments (due to safety factors and design criteria) limit opportunities to avoid or reduce negative environmental impacts.

When compared to roadways, environmental impacts resulting from the construction of sidewalks and bicycle facilities are much smaller in magnitude, due to smaller cross-sections and greater design flexibility. Furthermore, pedestrian and bicycle facilities are most often built in conjunction with roadway facilities, and have only marginal environmental impacts beyond those of the roadway itself. Bicycle and pedestrian travel is also inherently less disruptive to the environment than travel by automobile, especially with respect to air pollution, noise, and energy consumption.

Most of the transit projects in the LRTP involve changes to bus routes and bus service expansion. These projects typically involve no new construction, and have a net positive impact on natural or man-made environments. In general, transit environmental impacts tend to be positive, in that increased transit service tends to reduce overall vehicle-miles traveled, thus reducing demand for new road construction, and reducing vehicle emissions. As a result, it is difficult to identify environmental impacts for transit facilities in the context of this LRTP update. Specific studies are needed to assess the impacts of these transit systems.

Consultation and Mitigation

Development of the LRTP gives DMATS the opportunity to consult with environmental agencies and review environmental impacts resulting from project recommendations. The LRTP is an initial step in identifying impacted areas and adjusting project alignments to minimize impacts on natural resources. The LRTP also allows DMATS, as the project sponsor, to make informed decisions when setting project priorities for the area. The result is a transportation plan that not only minimizes negative impacts on the natural environment, but that is ultimately more efficient, timely, and cost-effective.

Since the transportation planning activities of DMATS are regional in scope, this environmental mitigation discussion does not provide a detailed analysis of individual projects within the LRTP, but rather offers a summary of the potential impacts on environmentally sensitive areas. DMATS conducts this analysis to identify conflicts between planned projects and environmentally sensitive areas. The analysis process is an effort to minimize negative effects that a project can have on environmentally sensitive areas.

In order to meet these requirements, it is essential to know how federal regulations actually define mitigation:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments. (Source: 40 CFR 1508.20)

An ordered approach to mitigation, known as "sequencing," involves understanding the affected environment and assessing transportation effects throughout project development. Effective mitigation starts at the beginning of the environmental process, not at the end. Mitigation must be included as an integral part of the alternatives development and analysis process.

SEQUENCING:

AVOID > MINIMIZE > REPAIR/RESTORE > REDUCE OVER TIME > COMPENSATE

FHWA's mitigation policy states: "Measures necessary to mitigate adverse impacts will be incorporated into the action and are eligible for Federal funding when the Administration determines that:

- The impacts for which mitigation is proposed actually result from the Administration action; and
- "The proposed mitigation represents a reasonable public expenditure after considering the impacts of the action and the benefits of the proposed mitigation measures. In making this determination, the Administration will consider, among other factors, the extent to which the proposed measures will assist in the compliance with a Federal statute, Executive Order, or Administration regulation or policy." (Source: 23 CFR 771.105(d))

Environmental Mitigation Activities

DMATS is committed to minimizing and mitigating the negative effects of transportation projects on the natural and built environments in order to preserve our quality of life. In doing so, DMATS recognizes that every project will not require the same type or level of mitigation. Some projects, such as new roadways and roadway widening, involve major construction with considerable earth disturbance. Others, like intersection improvements, street lighting, and resurfacing projects, involve minor construction and minimal, if any, earth disturbance. The mitigation efforts used for a project should depend on the severity of the expected impact on an environmentally sensitive area. DMATS uses the following three-step process to determine the type of mitigation strategy to apply for any given project:

- Identify and confirm environmentally sensitive areas throughout the project study area.
- Determine how and to what extent transportation projects will affect these environmentally sensitive areas.
- Develop and review appropriate mitigation strategies to lessen the impact of these projects on the environmentally sensitive areas.

The table below details mitigation activities and measures that DMATS members consider when dealing with environmental impacts. Measures considered include construction of sidewalks and bicycle lanes, design modifications to reduce community impacts, and request noise barriers and landscaping to reduce audio and visual impacts.

Table 8.1

Impacts	Mitigation Measures
Air Quality	Designate pedestrian/transit oriented development areas
	Adopt local air quality mitigation fee program
	Develop energy efficient incentive programs
	Adopt air quality enhancing design guidelines
Archaeological	Archaeological excavation
	Design modifications to avoid area
	Educational activities
Community Impacts	Bridge community
	Sidewalks
	Bike lanes
	Develop recreational areas
	Traffic calming
	Oral history project
Environmental Justice	Property Owners paid fair market value for property acquired
Communities	Residential and commercial Relocation
Farmland	Protect one to one farmland acre for every acre converted
	Agricultural conservation easement on farmland
	Compensation
Fragmented Animal Habitats	Construct overpasses with vegetation
	Construct underpasses, such as culverts and viaducts
	Other design measures to minimize potential fragmenting of animal habitats
Historic Sites	Relocation of historical property
	Design modification
	Landscaping to reduce visual impacts
	Photo documentation
	Historic archival recording to present historic information to the public
Light Impacts	Lens color
	Direction of lighting
	Low level lighting
Noise	Depressed roads
	Noise barriers
	Planting trees
	Construct tunnels

Park Impacts Table 8.2	Construct bike/pedestrian pathways
	Dedicate land
	Compensation for park dedication fees
	Replace impaired functions
Threatened & Endangered species	Preservation
	Enhancement or restoration of degraded habitat
	Creation of new habitats
	Establishment of Buffer areas around existing habitats
	Modifications of land use practices
	Restrictions on land access
Viewshed Impacts	Vegetation and landscaping
	Screening
	Buffers
	Earth berms
	Camouflage
	Lighting
Wetlands	Compensation
	Wetland restoration possible through EEP
	Creation of new wetlands
	Strict erosion and sedimentation control measures

Environmental Justice

Federal Executive Order 12898 sets out requirements for transportation and Environmental Justice. The intent is to demonstrate that minority and low-income communities will not be disproportionately affected in an adverse manner under the transportation plan. Environmental justice requirements also address public involvement, and these requirements are satisfied under DMATS's Public Participation Plan and the steps taken for the LRTP public involvement effort.

Environmental Justice is a concept intended to avoid the use of federal funds for projects, programs, or other activities that generate disproportionate or discriminatory adverse impacts on minority or low income populations. This effort is consistent with Title VI of the 1964 Civil Rights Act, and is promoted by the U.S. Department of Transportation (USDOT) as an integral part of the long-range transportation planning process. The environmental justice assessment incorporated in the LRTP update is based on three basic principles, derived from guidance issued by the USDOT:

- The planning process should minimize, mitigate, or avoid environmental impacts (including economic, social, and human health impacts) that affect minority and low-income populations with disproportionate severity.

- The benefits intended to result from the transportation planning process should not be delayed, reduced, or denied to minority and low income populations.

- Any community potentially affected by outcomes of the transportation planning process should be provided with the opportunity for complete and equitable participation in decision-making.

As part of this LRTP update, DMATS staff identified the geographic distribution of low-income and minority populations in order to assess the effects of various transportation investments in the plan. This update to the LRTP also includes analysis of the elderly population. Map __ will provide the locations of minority, low income and elderly population in the region.

Analysis

A qualitative screening was performed to assess the potential environmental impacts of the roadway projects recommended for inclusion in the DMATS 2040 LRTP. This analysis consisted of overlaying project locations and sensitive natural and social resource locations Figures 8.2 through 8.6. Any proposed project determined to encroach on a sensitive area is identified. The nature and degree of conflict determines the level of impact assessed. For example, a road widening is typically assumed to be less disruptive to the natural environment than a comparable project on new alignment. On the other hand, widening may be more disruptive than a new facility in terms of community impacts, which depend on available right-of-way, alignment, type of development, and other factors.

Since this is a system-wide, planning-level screening, no formal field investigation was conducted, and screening was performed on those features for which GIS coverage was available. In some instances GIS was updated to reflect environmental features that were identified during individual project studies. The assessments also took into account any recent studies that had been done for individual projects. As project spacific plans are further refined, more precise environmental assessments may be necessary. For some of the projects in the LRTP, environmental studies based on federal guidelines are already underway or completed.

Environmental

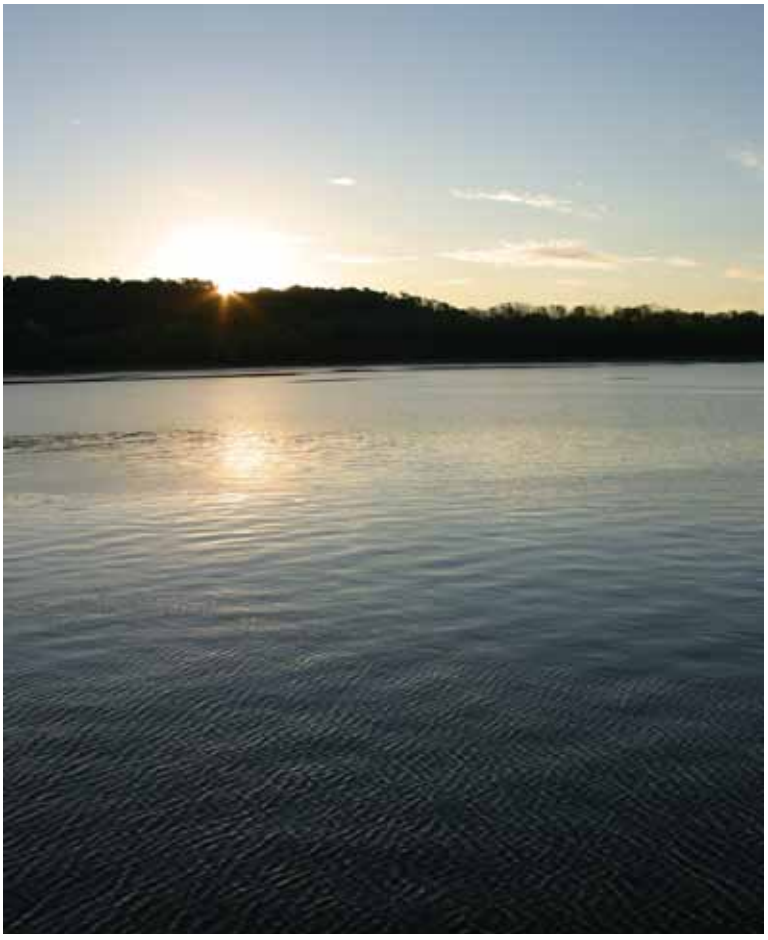
- Hydrological
- Lakes
- Wetlands
- Watersheds
- Underground Storage Tanks
- Endangered Species
- Significant Natural Habitat Areas
- Land Fills

Social

- Schools
- Hospitals
- Historic Resources
- Cemeteries
- Farmlands
- Parks/Open spaces

Environmental Justice

- Minority Population
- Elderly
- Low-Income



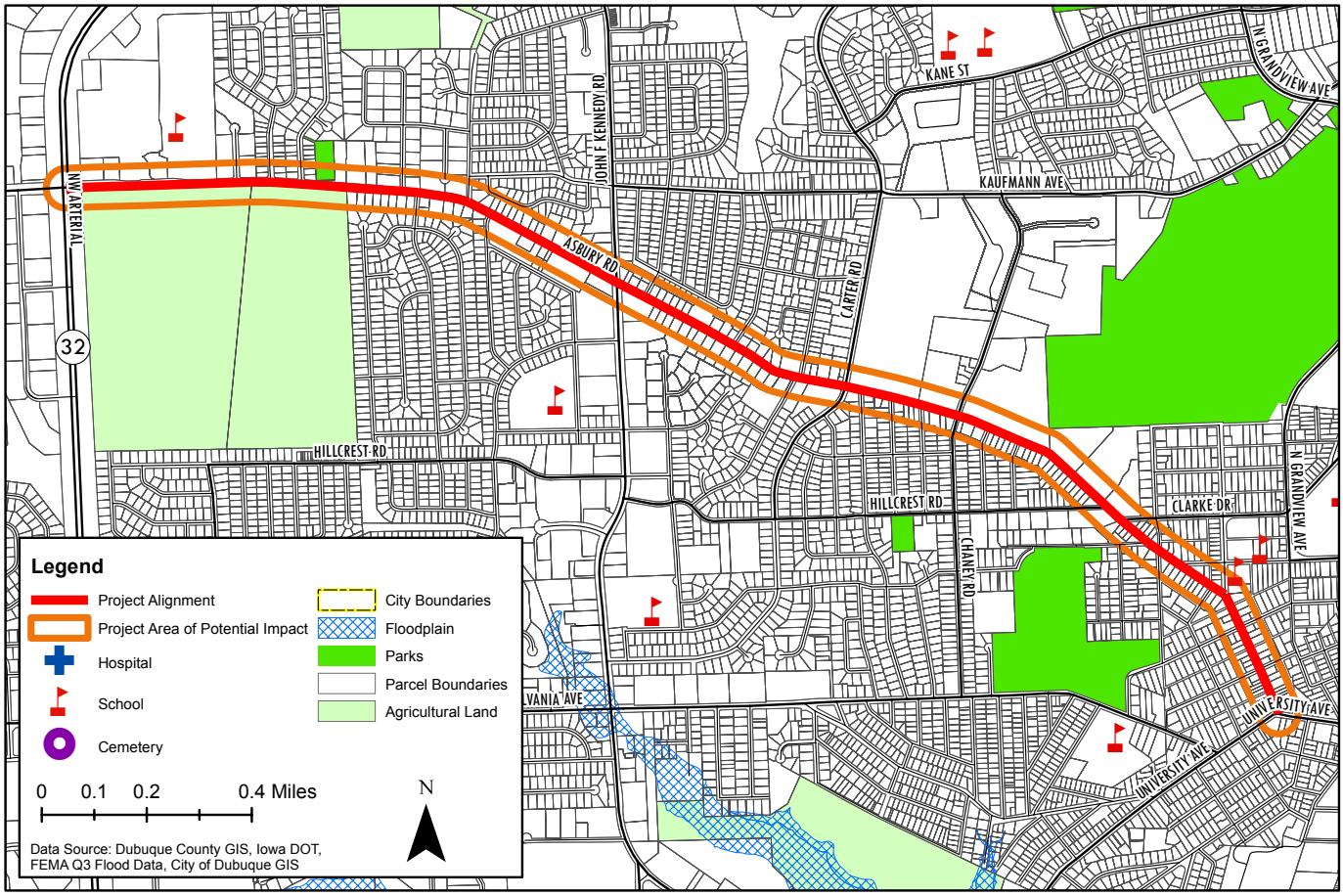
Potential project impacts (if any) are classified as “Minor,” “Moderate,” or “Major” for each of the above categories. This determination is based on a combination of objective and subjective criteria. For example, impacts are generally considered less severe if the project involves widening or other improvements along an existing roadway, as opposed to construction on new alignment.

Buffer Distance

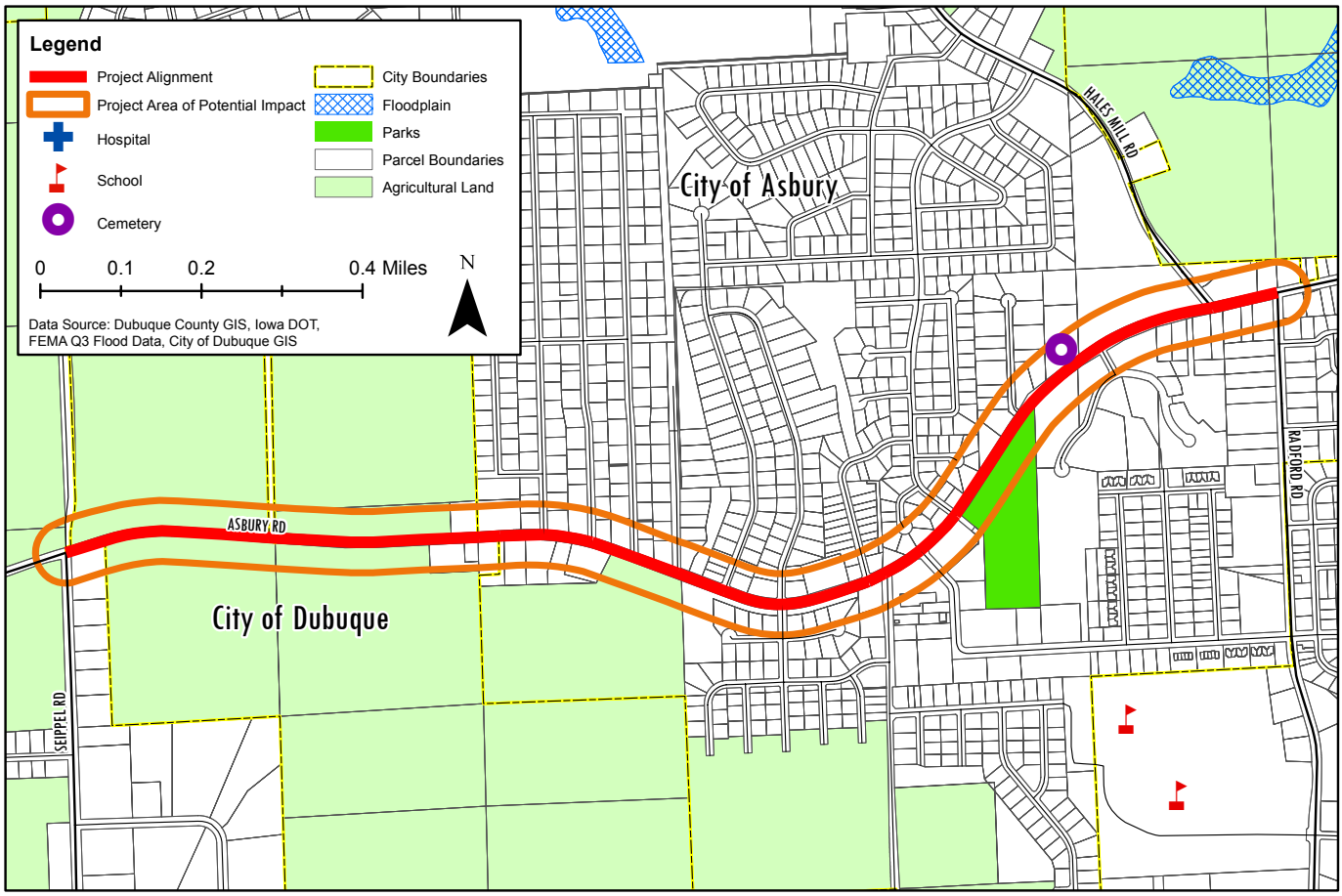
Buffers were assigned to each of the proposed transportation project documented in Chapter 8 Projects, which are located on the federal aid system. The buffer sizes are determined based on the project size and location. SW Arterial has 800 feet on each side of the road making it 1600 feet wide for overall project. The environmental factors that are listed above have been taken into consideration.

Environmental Analysis Maps

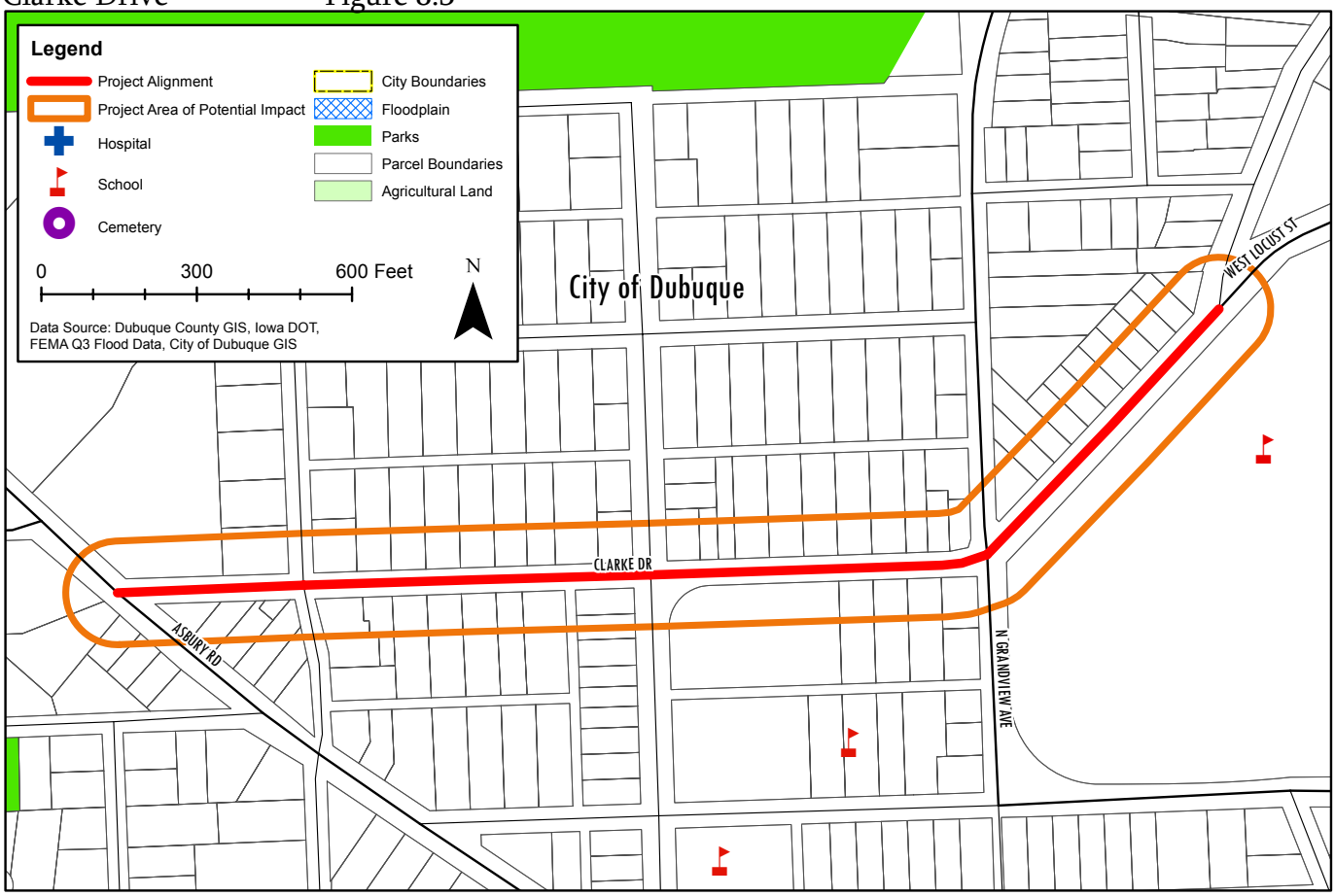
Figure 8.1
Asbury Road - NW Arterial to University Ave



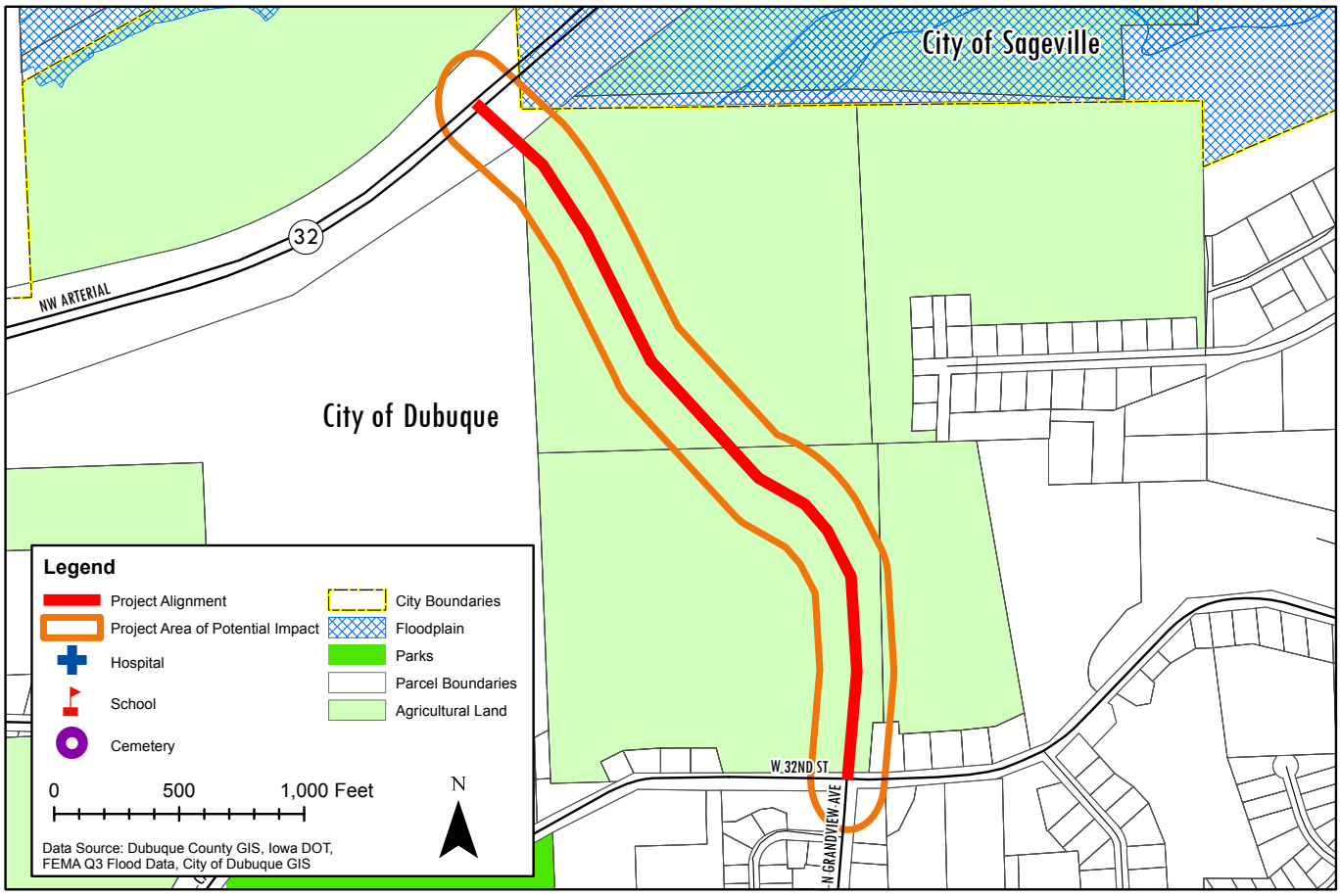
Asbury Road – Seippel to NW Arterial Figure 8.2



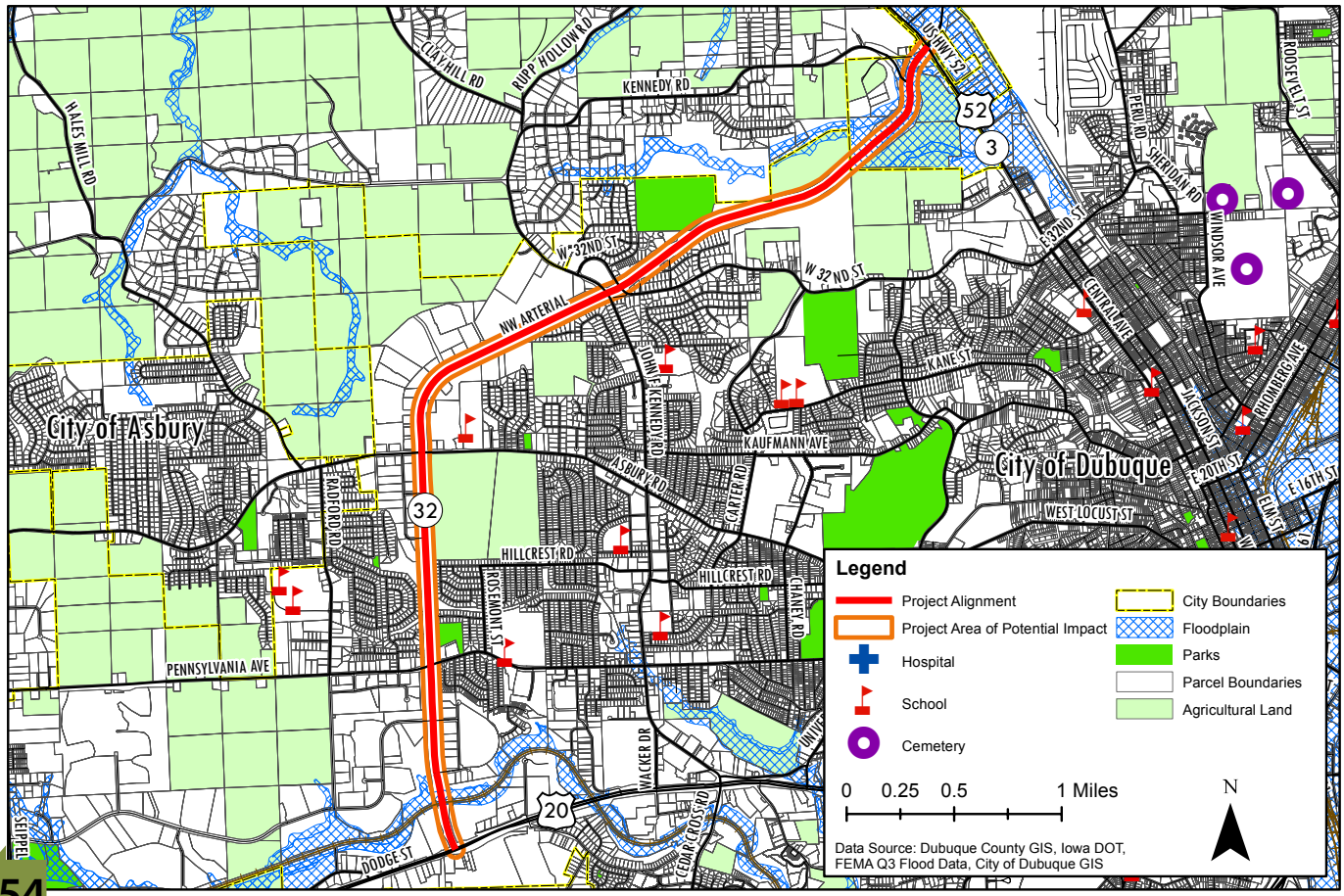
Clarke Drive Figure 8.3



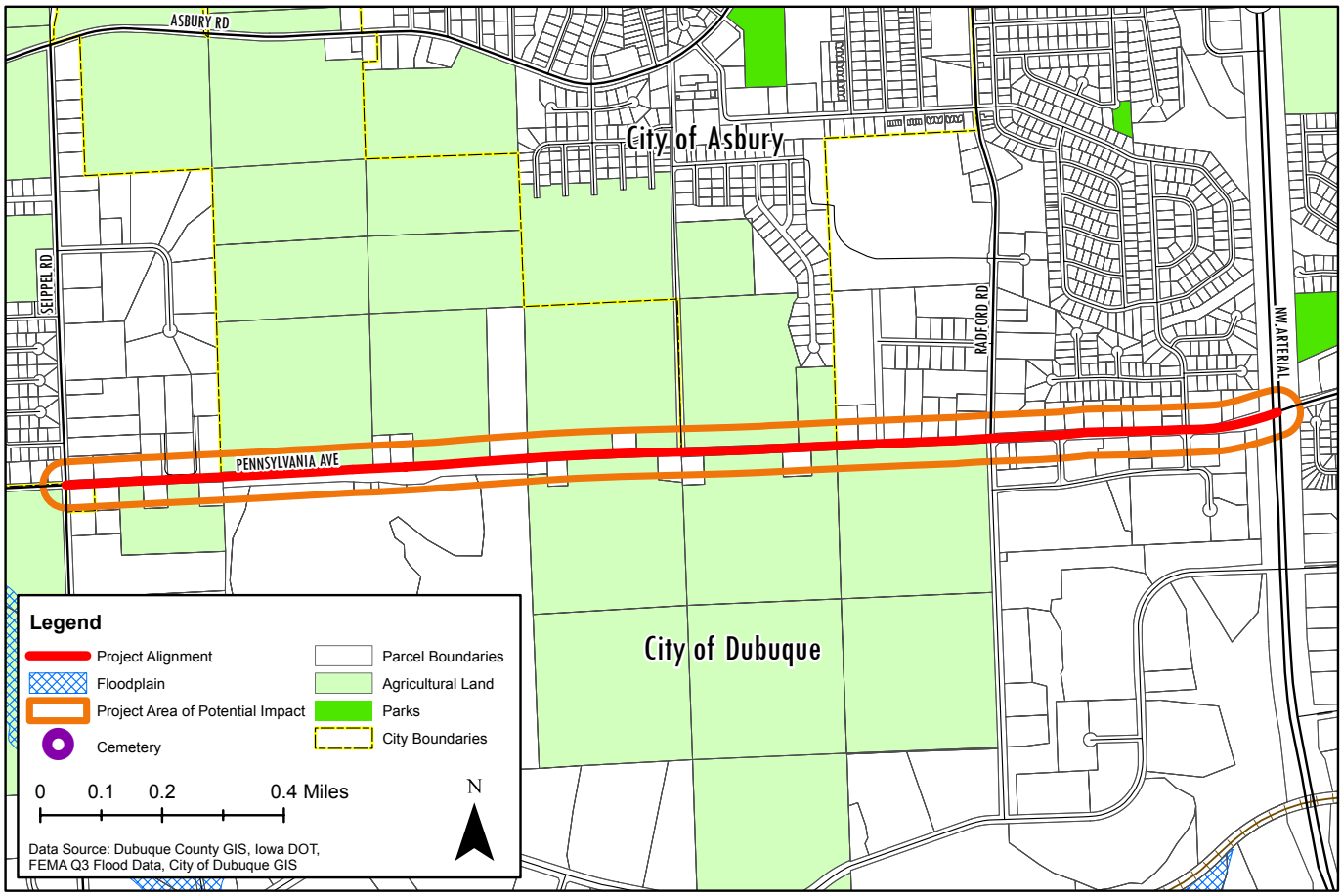
Grandview Avenue Extension Figure 8.4



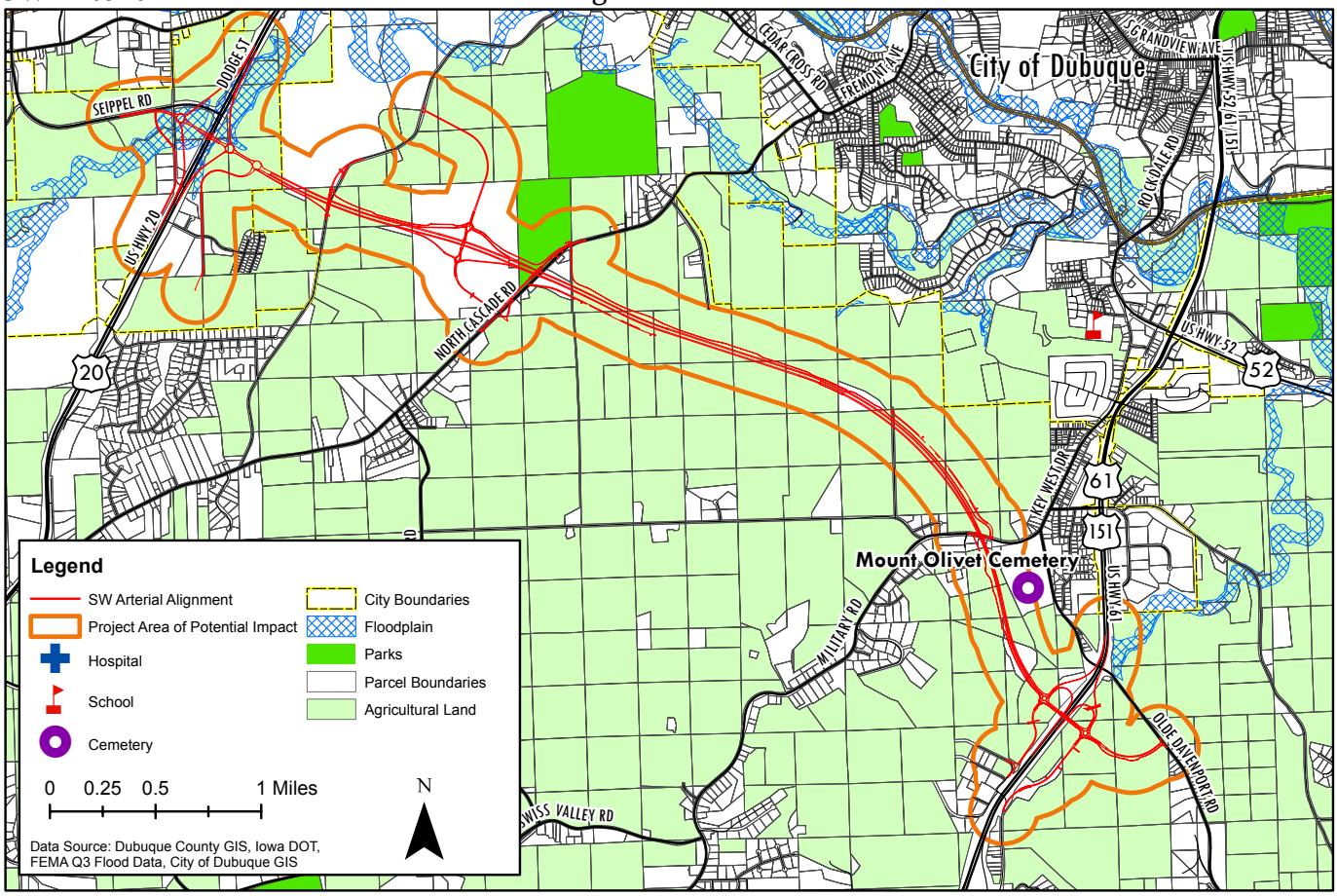
NW Arterial Figure 8.5



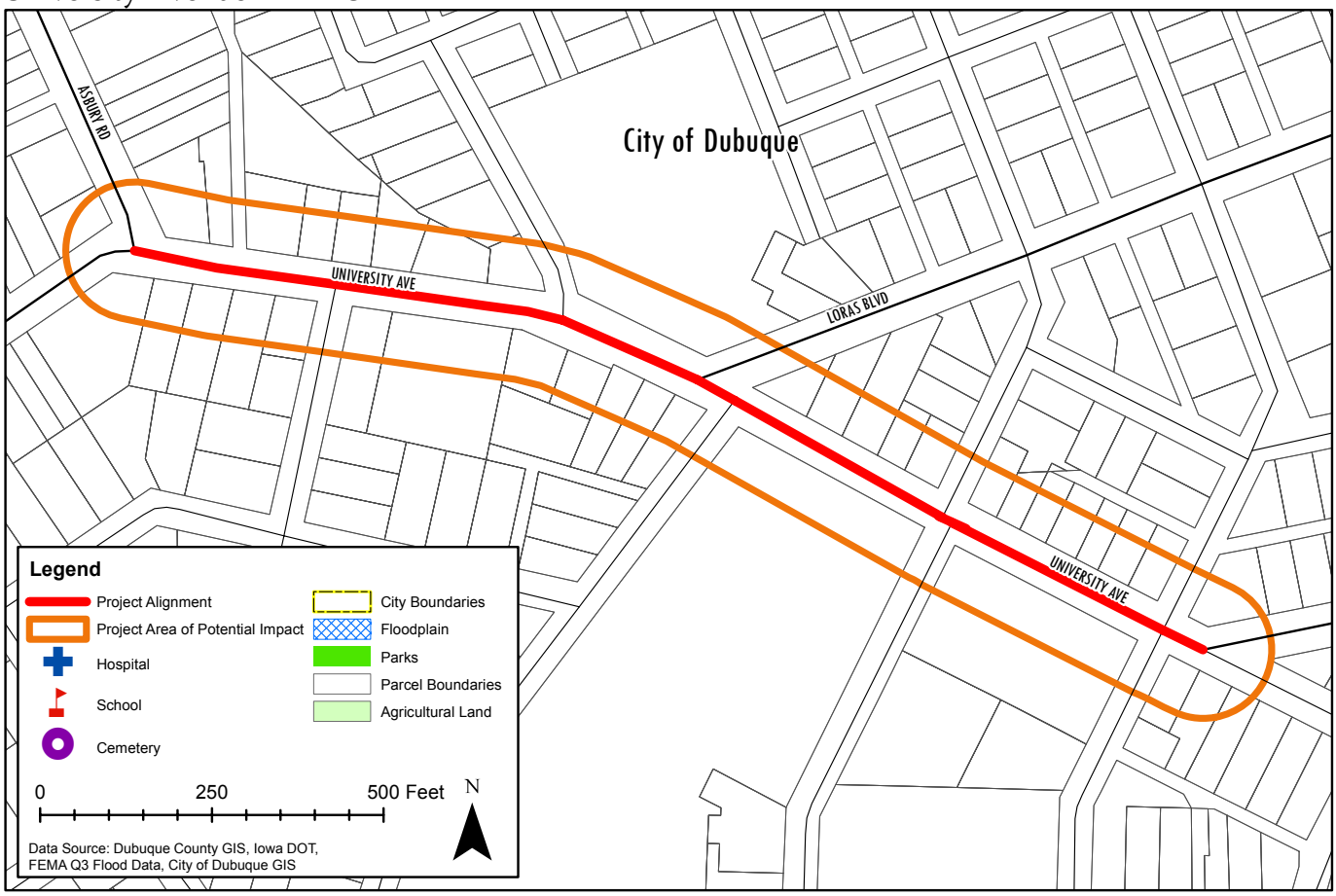
Pennsylvania Ave – Seippel Road to NW Arterial Figure 8.6



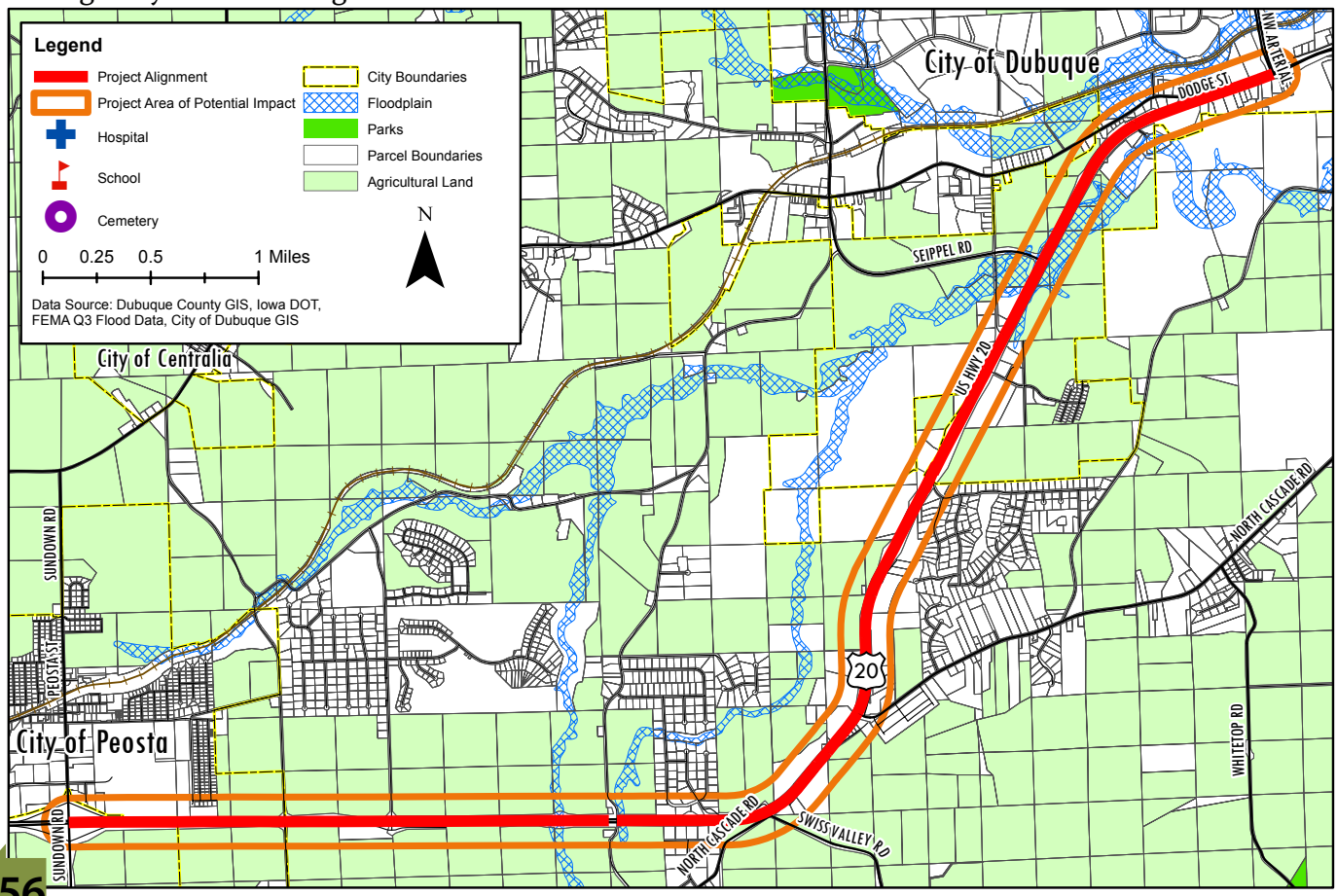
SW Arterial Figure 8.7



University Avenue Figure 8.8



US Highway 20 Figure 8.9



Chapter 9: Project Prioritization

The proposed roadway projects in this plan have a total cost of over $231 million. This substantially exceeds the federal fund budget that is available to the MPO. Under SAFETEA-LU, DMATS is required to produce financially constrained transportation plans. This means that the MPO must identify its priorities for the expenditure of federal funds that it can reasonably be expected to have access to in the 30-year plan time frame. The prioritization process divides the projects into real projects and illustrative projects. DMATS Policy Board views the real projects as highest priority and has made a commitment of federal funds. Illustrative projects are those that are necessary to meet the transportation needs of the area in the future, but no funding sources have been identified.

DMATS staff have created a project ranking process that includes seven categories. Each category has a possible point total. The total number of points a project can be awarded is 1,000. Points are awarded in the Safety, Air Quality, Economic Impact II, and System Preservation categories based on numeric values obtained from data analysis. Economic Impact I, Accessibility and Mobility, Local and Regional Impact, and Compete Street categories are subjective. TAC members recommend rankings in the subjective categories based on the project's merits. DMATS staff will provide TAC members with project information and data analysis to determine the merit of the projects.

Safety (200)

The safety analysis is a benefit cost ratio that compares the total cost of the project to the safety benefits created by the project. Points for safety are awarded based on a numerical formula that monetizes the benefits that result from the implementation of the project, and divides the benefits by the total project cost.

Data sets required to run the analysis include total lifetime project cost, crash reduction factor, traffic volume, fatalities, major injuries, minor injuries, and property damage. Points are awarded based on the safety scoring criteria. See Table 9.1.

Table 9.1

Safety Scoring Criteria	
Benefit - Cost Ratio	Points
<1.00	0
1.00-1.10	25
1.10-1.20	50
1.20-1.30	75
1.30-1.60	100
1.60-2.00	125
2.00-2.20	150
2.20-2.40	175
2.40+	200

Economic Impact

The economic analysis is designed to measure the local and regional economic impact of the proposed project. The economic impact component of the ranking process comes in two parts, each worth 100 points. The first component is intended to measure the long term impacts of the project. The second component measures the short term economic impact generated by design and construction of the project.

Economic Impact I (100)

TAC members will award points based on the project's long term impacts on the regional economy. Staff will provide project data for reference during the scoring process. Points are awarded based on the Economic Impact I Scoring Criteria. See Table 9.2.

Table 9.2

Economic Impact I Scoring Criteria	
Q1	20 Points - Project promotes general economic development.
Q2	20 Points - Project specifically enhances or improves tourism.
Q3	20 Points - Project specifically improves or enhances movement of freight and services.
Q4	20 Points - Project improves or enhances movement of workers.
Q5	20 Points - Project improves access to jobs and business opportunities.

Economic Impact II (100)

The Economic Impact II analysis will be performed using an input output (I\O) model. The I\O model is an accounting of transactions among industries, governments, households, imports, and exports in the DMATS area. The I\O model helps study the linkages between industries and institutions in the area. Knowledge of these linkages allows the modeler to calculate the direct, indirect, and induced economic impact of a project on the region. For this ranking process, the I/O analysis will provide information on the short term economic impact on the construction sector; i.e. job creation and increases in output in construction, and in construction related industrial sectors. Points will be awarded based on the total number of jobs created by each project. The chart illustrates how the 100 points are awarded to each project. Points are awarded based on the Economic Impact II Scoring Criteria. See Table 9.3.

Table 9.3

Economic Impact II Scoring Criteria	
Number of Jobs Created	Points
> 300	100
201 to 300	75
101 to 200	50
< 100	25

System Preservation (120)

Points for system preservation are awarded based on current surface type, current pavement condition, current AADT, and future AADT. The information for each of the previously mentioned categories is plugged into a formula and the point value is determined by where the formula solution fits into the points range. Below is an example of how the system preservation formula may be applied to a proposed project:

1) Surface Type: Portland Concrete 1
2) Facility Condition: 2
3) Existing AADT: 5,800
4) 10-year projected AADT: 6,400

Formula 1: [(Existing AADT + 10 Year AADT)/1000/2]
Formula 2: [(Formula 1 Answer/2)*(Surface Type)*(Facility Condition)]

Formula 1: [(5,800 + 6,400)/1,000/2] = 6.1
Formula 2: [(6.1/2)*(1)*(2)]= 6.1 = Project awarded 52 Points as shown Table 9.4.

Table 9.4
System Preservation Scoring Criteria

Range	Pts
<.2	2
2.00-4.00	4
4.00-6.00	7
6.00-8.00	9
8.00-10.00	12
10.00-12.00	14
12.00-14.00	16
14.00-16.00	19
16.00-18.00	21
18.00-20.00	24

Range	Pts
20.00-22.00	26
22.00-24.00	28
24.00-26.00	31
26.00-28.00	33
28.00-30.00	36
30.00-32.00	38
32.00-34.00	40
34.00-36.00	43
36.00-38.00	45
38.00-40.00	48

Range	Pts
38.00-40.00	48
40.00-42.00	50
42.00-44.00	52
44.00-46.00	55
46.00-48.00	57
48.00-50.00	60
50.00-52.00	62
52.00-54.00	64
54.00-56.00	67
56.00-58.00	69

Range	Pts
58.00-60.00	72
60.00-62.00	74
62.00-64.00	76
64.00-66.00	79
66.00-68.00	81
68.00-70.00	84
70.00-72.00	86
72.00-74.00	88
74.00-76.00	91
76.00-78.00	93

Range	Pts
78.00-80.00	96
80.00-82.00	98
82.00-84.00	100
84.00-86.00	103
86.00-88.00	105
88.00-90.00	108
90.00-92.00	110
92.00-94.00	112
94.00-96.00	115
96.00-98.00	117
98+	120

Local and Regional Impact (120)

The local and regional impact component will evaluate consistency with local planning documents, impacts on the local and regional transportation system, and the number of project sponsors (local governments) involved. Adopted planning document include a long range transportation plan, comprehensive plan, capital improvements plan, or any other local, regional, or state planning document. See Table 9.5.

Table 9.5

Local and Regional Scoring Criteria	
Q1	40 Points - Project will contribute to the local AND regional transportation system.
Q2	40 Points - Proposed project involves more than one jurisdiction.
Q3	40 Points - Project improves access to other transportation facilities including air, water, rail, multimodal, etc.

Accessibility and Mobility (120)

The Accessibility and Mobility component is designed to measure improvements in land use accessibility and mobility for users of the transportation system resulting from the project. Accessibility and mobility points are awarded based on estimated reductions in congestion resulting from the project.

Data required for the analysis: existing AADT, existing capacity, future AADT, and future capacity. The model calculates existing and future V/C ratios using the AADT and capacity data. The model then calculates the percent change in V/C ratio. Points are awarded based on the Accessibility and Mobility Scoring Criteria. See Table 9.6.

Table 9.6

Accessibility and Mobility Scoring Criteria	
Percent	Points
<-10%	0
-10 to -20%	25
-20 to -30%	50
-30 to -40%	75
-40 to -50%	100
>-50+	120

Complete Streets (120)

This component is designed to measure how the project addresses the concept of complete streets. The complete streets concept stresses the provision of safe access for motorists, pedestrians, bicyclists, and transit users. DMATS TAC members will award points based on the two questions listed below.

Table 9.7

Complete Streets Scoring Criteria		
Q1	40 Points	Project improves connectivity to a road classified as arterial or higher?
Q2	80 Points	Project integrates multiple modes of transportation including bike, pedestrian, transit, and auto?

Air Quality (120)

Points for air quality are awarded based on results of an air quality analysis called "GlobeWarm." GlobeWarm provides a methodology for analyzing the environmental impact of a transportation project. Data on corridor length, number of lanes, traffic volume, and traffic speed are entered into GlobeWarm. Based on this information, GlobeWarm estimates the amount of green house gas (GHG) produced. Current corridor GHG emissions are compared with estimated GHG emissions after the improvements are made. The model estimates the percent change in GHG emissions resulting from the project. Points are awarded based on the Air Quality Scoring Criteria. See Table 9.8.

Table 9.8

Air Quality Scoring Criteria	
Range	Points
< -5%	0
-5 to -10 %	25
-10 to -12 %	50
-12 to -13 %	75
-13 to -15 %	100
> - 15%	120

Project Evaluation Results

The results of the project prioritization analysis are listed in Table 9.9. The DMATS LRTP is a financially constrained plan. Funding will be allocated to the projects based on the priorities established in this chapter. Priority number one will receive funding, then priority number two, and so on down the list until all funds are allocated. Lower priority projects that do not receive funding will be designated as illustrative. Projects included in the FY 2011-2015 TIP were not included in the ranking process, as funding has already been allocated to these projects through the TIP process. Iowa DOT projects were not ranked, as DMATS does not provide funding for these projects.

Table 9.9

Project Info			DMATS LRTP Ranking								
Rank	**Project Name**	**To & From**	**SAFETY** (200 points)	**AIR QUALITY** (120 points)	**ECONOMIC IMPACT I** (100 points)	**ECONOMIC IMPACT II** (100 points)	**SYSTEM PRESERVATION** (120 points)	**ACCESSIBILITY AND MOBILITY** (120 points)	**LOCAL AND REGIONAL IMPACT** (20 points)	**COMPLETE STREETS** (120 points)	**Total** (1000 Points)
1	US 52 Improvements	Central & White (9th to 22nd)	200	100	100	25	62	84	120	120	811
2	Asbury Rd West	NW Arterial to Seippel Road	200	100	80	25	55	42	80	120	702
3	NW Arterial	US 20 to US 52	75	75	80	100	57	84	80	120	671
4	JFK	NW arterial to Wacker to US 20	200	100	60	25	72	30	40	120	647
5	Asbury Rd East	NW Arterial to University Ave	125	100	80	75	28	60	40	120	628
6	Pennsylvania Ave	University Ave to Seipple Rd	25	100	60	100	57	72	80	120	614
7	Loras Blvd	Univeristy Ave to Alta Vista	200	100	40	25	31	42	40	120	598
8	University Ave	Pennsylvania Ave to Delhi St	25	100	60	50	108	60	40	120	563
9	Sipple Rd	Asbury Rd to Pennsylvania Ave	100	100	80	25	26	66	40	120	557
10	Grandview Avenue Extension	32nd St to NW arterial	200	100	20	25	4	42	40	120	551
11	Seventh St Reconstruction	Central Ave to Commercial St	0	100	100	25	7	90	80	120	522
12	Century Dr	Sylvan Dr to US 20	100	100	60	25	2	48	40	120	495
13	Rockdale Rd	Old Mill Rd to Maquoketa Dr	0	100	40	25	52	0	40	80	337
FY 2011-2015 TIP Projects											
-	SW Arterial	US 151/61 to US 20									
-	North Cascade Rd	Edval Ln to Catfish Creek Bridge									
-	Kuaffman Ave	JFK to Carter & Carter to Central Ave									
-	Hales Mill Rd	Asbury Rd to Derby Grange Rd									
-	Monastery Road	Sundown to US 151									
-	Cedar Cross	725' E of Starlight Dr to Lake Ridge Dr									
-	Intermodal Facility										
-	Passenger Rail										
Iowa DOT Projects											
-	US 20 Improvements	Davon Dr to Old Highway									
-	US 20 Improvements	Old highway to Peosta									
-	US 20 Intersection Improvment	Swiss Valley Rd Interchange									
-	US 52 Improvements	NW arterial to City of Sageville									
-	US 20 Bridge	Bridge on Mississippi River									
Wisconsin DOT Projects											
-	Region Wide Planning Study	Various Highways									
Illinois Projects											
-	Illinois 35										
-	Frentress Lake Rd Overpass										
-	US 20 Imrovemetns	Barge Terminal Rd Intersection									
-	Minominee Ave Resurfacing	2nd St to 6th St									
-	US 20 Bridge										

Project Funding Schedule

As stated in the Finance Chapter, DMATS staff used a Linear Regression method to project future revenues over the 30-year time horizon of the DMATS LRTP. Staff then used the prioritization process described in this chapter and the future revenue projections to create the project funding schedule displayed in Table 9.10.

In schedule, funds were allocated in five-year increments to projects based on their rank. The project schedule assumes a constant 4% annual project cost increase. The future project cost was calculated based on the assumption that all projects would be implemented midway through the five year period.

Based on the revenue projections, DMATS will be able to fund the projects ranked 1-13. DMATS will consider these to be Real, or the highest priority projects with federal funds committed. DMATS will consider any remaining projects to be Illustrative. Illustrative projects will meet the needs of the area in the future, but no funding source has been identified.

Table 9.10

Rank	Name	Estimated Cost	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040
Projects Programmed in FY2011- FY2015 TIP								
	SW Arterial	$ 63,744,000	$ 5,044,000	$ 38,400,000	$ 34,710,000			
	North Cascade Rd	$ 924,000	$ 960,960					
	Kauffman Ave	$ 720,500	$ 749,320					
	Hales Mill Rd	$ 2,000,000	$ 2,080,000					
	Monastery Road	$ 9,456,000	$ 9,834,240					
	Cedar Cross Rd	$ 1,800,000	$ 1,872,000					
	Intermodal Facility*	$ 20,000,000	$ 20,000,000					
	Passenger Rail	$ 2,200,000	$ 2,200,000					
Real Projects								
1	US 52 (Central/White)	$ 2,313,000		$ 2,775,600				
2	Asbury Rd West	$ 592,393		$ 710,872				
3	NW Arterial	$ 57,533,760		$ 48,713,008	$ 22,360,254			
4	JFK Rd	$ 531,400			$ 690,820			
5	Asbury Rd	$ 20,114,977			$ 2,873,926	$ 25,603,098		
6	Pennsylvania Ave	$ 34,611,895				$ 37,156,902	$ 12,429,727	
7	Loras Blvd	$ 74,000					$ 111,000	
8	University Ave	$ 11,693,329					$ 17,539,993	
9	Seippel Rd	$ 2,664,000					$ 3,996,000	
10	Grandview Ave Ext	$ 3,600,000					$ 5,400,000	
11	Seventh St	$ 2,400,000					$ 3,600,000	
12	Century Dr	$ 1,385,600					$ 2,078,400	
13	Rockdale Rd	$ 4,170,000					$ 6,255,000	
Illustrative Projects								
	Bicycle and pedestrian projects listed in the LRTP but not included as part of a corridor are illustrative							
	Wisconsin							
	Region Wide Planning Study							
	Illinois							
	Illinois 35 Resurfacing							
	Frentress Lake Rd Overpass							
	US 20 Improvements							
	Menominee Ave Resurfacing							
	US 20 Bridge							
		Forecast	$ 52,630,000	$ 90,599,480	$ 60,635,000	$ 62,760,000	$ 64,885,000	$ 67,010,000
		Total Cost	$ 20,540,520	$ 90,599,480	$ 60,635,000	$ 62,760,000	$ 51,410,119	$ -
		Difference	32,089,480	-	-	-	13,474,881	67,010,000

* The Intermodal Facility is programed in the FY 2011-2015 TIP, but is a transit project and is there recognized as an illustrative project, as there is no dedicated funding source for transit projects.

OVERVIEW

Given the important role that transportation plays in determining the quality of life and economic success of the region, it is important that the policies and actions of the 2040 LRTP be advanced. A major component of insuring that the recommendations of the 2040 LRTP are advanced is the development of a finance plan to allocate reasonably expected revenues.

Anticipated Revenue Projections

Title 23 of the U.S. Code of Federal Regulations governing MPOs requires the LRTP to "include a financial plan that demonstrates the consistency of proposed transportation investments with already available and projected sources of revenue." The requirement further states that "the estimated revenue by existing revenue source (local, state, federal, and private) available for transportation projects shall be determined..." and "all cost and revenue projections shall be based on the data reflecting the existing situation and historical trends." Projections of future anticipated federal formula funds were developed based on the amounts authorized in SAFETEA-LU as the defined "existing situation" referenced in Title 23 with respect to anticipated federal revenues. These projections represent a conservative amount of federal formula funding that can be reasonably expected over the next 20 years based on past funding levels. In addition, state and local funds were incorporated into the analysis based on historical trends. Combined, federal, state and local comprise the vast majority of revenues available to maintain and operate the federal-aid transportation system in the region.

Funding Overview

Introduction

The DMATS MPO's transportation system improvements are funded through a combination of federal, state, and local funds. DMATS member governments and participating agencies utilize this combination of funds for demand management, operational management, and capital-intensive strategies. Federal funding for streets and highways, bicycle and pedestrian facilities flow through DMATS

Revenue sources for Roads, Bridges & Trails

Several federal, state, and local funding sources provide revenues to fund the transportation system in the DMATS region. The funding sources that can be used for the projects within the region are addressed. The funding sources are broken down into Federal, State and Local funding sources that the DMATS members receive every year and funding sources that are based on application process.

Surface Transportation Program (STP)

STP funds represent the federal funding main resource that can be committed by DMATS to transportation improvements. The funding can be used for:

- aid public road jurisdictions with funding for road or bridge projects;
- provide funding for transit capital improvements;
- provide funding for bicycle and pedestrian facilities; and
- provide funding for transportation planning activities.

A minimum of 20 percent non-federal match is required (80 percent federal funding). Road projects must be on federal-aid roads, which includes all federal functional class routes except local and rural minor collectors (see exception under "qualifications for funding"). Bridge projects may be on any public road.

Transit projects Capital improvements require adherence to approved transit procurement procedures and equipment specifications. Project candidates must be part of an approved five-year Capital Improvement Program. Federally funded projects must comply with civil Right Protection requirements.

Funding Estimate: The DMATS has STP funding history from 2001 to 2010. Future year of expenditure funding was based on linear regression between 2010 and 2040. ($85 Million – Year of Expenditure Dollars) with an annual average of $1,242,167.00 and growth rate of 4.88%

National Highway System (NHS)

The National Highway System (NHS) program provides funding for improvements to rural and urban roads that are part of the system. A new Funding category under ISTEA, NHS consists of major roads in the U.S., including the interstate system; other routes identified for their strategic defense characteristics; routes providing access to major ports, airports, public transportation and intermodal transportation facilities; and principal arterials that provide regional service.

Funding in this category may be used for:

- roadway construction, operational and maintenance improvements,
- start-up for traffic management and control, infrastructure-based intelligent transportation system capital improvements, fringe and corridor parking, carpool and vanpool projects, bicycle and pedestrian projects, and wetlands and natural habitat mitigation.
- In certain circumstances, transit projects in the corridor are also allowed if they benefit the NHS facility.
- Publicly-owned intercity and intercity bus terminals are also eligible.

In addition, states have the option to shift 50% of the money to the STP category, which has greater project flexibility.

Funding Estimate: DMATS area received NHS funds from 2002 to 2010. The area received an annual average of $2,292,544.00 and a growth rate of 288%. These funds are not taken into consideration for future funding analyses as these funds are programmed and spent on DOT projects.

Highway Bridge Program (BR)

This federal program was established to fund the replacement or rehabilitation of structurally deficient or functionally obsolete public roadway bridges. The funding requires local match of 20 percent (80 percent federal funding). The bridge candidate must be classified as structurally deficient or functionally obsolete according to federal guidelines. Bridge replacement candidates must have a structure inventory and appraisal (SI&A) sufficiency rating of less than 50 and average daily traffic of at least 25 vehicles. Bridge rehabilitation candidates must have an SI&A sufficiency rating of 80 or less and average daily traffic of at least 25 vehicles. Cities are limited to $1 million per bridge candidate (only one bridge per City per year).

Funding Estimate: The DMATS has BR funding history from 2001 to 2010. The area did not receive funds in 2001 and 2007. Future year of expenditure funding was based on linear regression between 2010 and 2040. ($22 Million – Year of Expenditure Dollars) with an annual average of $521,624.00 and growth rate of 2.63%.

Historical Revenue analysis

Table 10.1 provides the historical funds received by DMATS for street, highways & bridges from 2001 to 2010. The table does not provide funding that DMATS is eligible for but did not receive. The analysis also provides information on earmarks, federal and state grant funds. These funding sources will not be used to do future analysis. Growth rate has been assigned to each funding using linear regression method. The growth rate is used to project future funding for the area.

Federal Transportation Enhancement Program (Federal-TE)

The Federal Transportation Enhancement Program funds enhancement or preservation activities associated with transportation related projects. Minimum 30 percent local match is required for statewide enhancements; 20 percent or more local match is required for regional enhancement projects as determined by the Regional Planning Affiliation and Metropolitan Planning Organizations (RPA/MPO) policies. Enhancements must have a direct relationship to existing or planned surface transportation facilities. Activity areas include:

- Trail and bikeway
- Historic and archaeological
- Scenic and environmental

Funding in this category may be used for:

- facilities for pedestrians and bicycles
- acquisition of scenic easements and scenic or historic sites
- scenic or historic highway programs, including provision of tourist and welcome center facilities
- landscaping and other scenic beautification, including graffiti and litter removal
- historic preservation
- rehabilitation and operation of historic transportation buildings, structures or facilities, including historic railroad facilities and canals
- preservation of abandoned railway corridors, including the conversion and use of those corridors for pedestrian or bicycle trails
- control and removal of outdoor advertising
- archaeological planning and research
- environmental mitigation to address water pollution due to highway runoff, or reduce vehicle-caused wildlife mortality while maintaining habitat connectivity
- provision of safety and educational activities for pedestrians and bicyclists
- establishment of transportation museums

Funding Estimate: The DMATS has TE funding history from 2001 to 2010. Future year of expenditure funding was based on linear regression between 2010 and 2040. ($4.2 Million – Year of Expenditure Dollars) with an annual average of $104,678.00 and growth rate of 2.23%

Safe Routes to School (SRTS)

The Safe Routes to School Program provides infrastructure and non-infrastructure improvements which will result in more students walking or bicycling to school. No local funding match is required. All applications must address both infrastructure and non-infrastructure components. Infrastructure improvements resulting from successful applications must be maintained as a public facility for a minimum of 10 years.

Funding Estimate: The DMATS area received SRTS funding in 2009. The area received a total funding of $35,000.00 in last ten years with an annual average of $3,500. Future estimates are kept constant at $3,500 annually as they are grant based.

Federal Recreational Trail Program

The Federal Recreational Trail Program provides funding for providing and maintaining motorized and non-motorized recreational trails and trail-related projects. A minimum of 20% match is required for this funding. Successful applications must be maintained as a public facility for a minimum of 20 years.

Funding Estimate: The DMATS area received Federal Recreational Trail funding in 2003. The area received a total funding of $737,376.00 in the last ten years with an annual average of $73,738. Future estimates are kept constant at $73,738 annually as they are grant based.

State Recreational Trail Program

The State Recreational Trail Program provides funding for public recreational trails. A minimum of 25% match is required for this funding. Volunteer services and other state grants are not eligible as matching funds. Proposed projects must be part of a local, area-wide, regional, or statewide trail plan. Successful applications must be maintained as a public facility for a minimum of 20 years.

Funding Estimate: The DMATS area received State Recreational Trail funding in 2002. The area received a total funding of $2,174,711 in last ten years. Future estimate is not done for these funds as they are grant based.

Table 10.2 provides the historical funds received by DMATS for Bike & Pedestrian from 2001 to 2010. The table does not provide funding that DMATS is eligible but did not receive. The analysis also provides information on federal and state grant funds. These funding sources will not be used to do future analysis. Growth rate has been assigned to each funding using linear regression method. The growth rate is used to project future funding for the area.

Table 10.1 Historic Federal Roads & Bridges Revenues

Historic revenues: Street, Highway & Bridge Funds											
Funding Source	**FY 2001**	**FY 2002**	**FY 2003**	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**Average Annual**
STP	$1,153,000	$1,171,000	$1,128,078	$1,128,078	$1,429,620	$1,052,473	$1,043,815	$1,268,630	$1,440,667	$1,606,313	$1,242,167
NHS	$0	$905,600	$8,982,636	$6,740,000	$1,573,200	$70,000	$822,000	$50,000	$400,000	$3,382,000	$2,292,544
BR	$0	$686,240	$1,105,000	$380,000	$740,000	$360,000	$0	$500,000	$500,000	$945,000	$521,624
ICAAP	$0	$0	$320,000	$0	$0	$260,370	$0	$779,000	$400,000	$0	$175,937
Earmarks	$0	$0	$10,657,364	$0	$39,696,635	$0	$0	$4,848,500	$950,000	$2,909,534	$5,906,203
State Funds	$0	$0	$0	$0	$0	$0	$0	$300,000	$223,000	$5,600,000	$612,300
Total	$1,153,000	$2,762,840	$22,193,078	$8,248,078	$43,439,455	$1,742,843	$1,865,815	$7,746,130	$3,913,667	$14,442,847	

Table 10.2 Historical Revenues from Bike & Pedestrian Funds

Historic revenues: Bike and Pedestrian Funds											
Funding Source	**FY 2001**	**FY 2002**	**FY 2003**	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**Average Annual**
MPO-TE	$102,000	$102,000	$98,000	$92,000	$105,000	$120,565	$98,595	$98,637	$110,803	$119,177	$104,678
SRTS	$0	$0	$0	$0	$0	$0	$0	$0	$35,000		$3,500
Federal-TE	$0	$0	$737,376	$0		$0	$0	$0	$0	$0	$73,738
Recreational Trails	$0	$0	$2,174,711	$0		$0	$0	$0	$0	$0	$217,471
Total	$102,000	$102,000	$3,010,087	$92,000	$105,000	$120,565	$98,595	$98,637	$145,803	$119,177	

DMATS Non-Federal Funds

In addition to federal funds, there are a number of local and regional funding sources that are used for operating and maintaining the region's transportation system. These include:

Cities:

- Road User Tax Funds (RUTF)
- Other Road Monies Receipts
- Receipts, Debt Service

Dubuque County:

- Property Tax
- RUTF
- TJ Revenue
- FM Extension
- Time -21
- Misc. Receipts
- Farm to Market

The funds can be used both on federal and non federal aid route construction as well as system maintenance and preservation. The funds can also be used for other local usage. Table 10.3 will provide the total DMATS Non-Federal revenues from 2004-2010.

Future Funding Analysis

The DMATS LRTP financial estimates are derived from an economic climate that is neither stable nor predictable. Revenues for the long-range plan are estimated at a planning level, not the programmatic level, as with the Transportation Improvement Program (TIP). DMATS financial projections are reviewed and adjusted regularly to reflect future economic trends. Once there is clarity around the new federal transportation bill and/or state revenues, staff will make adjustments to the plan's revenues.

This analysis is subject to a number of inherent limitations:

- The projections are for a period of 30 years, during which time significant changes are possible in travel behavior and transportation finance.
- Financial estimates are based on future funding estimates, not project-specific estimates, as with the TIP's programmatic approach.
- The analysis lumps federal, state and local funding together and compares the total against the aggregate expenditures identified in the plan.
- Revenues from local sources are projected into future by historical trends and percentage growth. However, this may not account accurately for private-sector funding that could support transportation improvements.
- Projections of federal funding involve a great deal of uncertainty due to shifts in federal transportation budget and deficit-reduction policies and because these funds are largely administered on a statewide basis.

• Ongoing maintenance costs were estimated by surveying state and local governments about current expenditures. Maintenance needs may be more accurately determined when region-wide pavement and bridge management/condition rating systems are in place.

• Cost estimates for many of the highway capacity projects may involve significant errors due to the long-range nature of the plan, the absence of detailed cost estimates based on actual design of the improvements, and the simplified methodology used to develop many of the estimates.

Procedure For Future Projections.

Transportation revenues rely on taxes and generally reflect the circumstances of the regional economy, and therefore fluctuate from year to year. Currently the DMATS 2040 LRTP's financial estimates are derived from information that is existing as of today. Over the 30-year time horizon for DMATS 2040 LRTP, there will likely be variation in the annual transportation revenues available to the region. However, for the purposes of the long-range plan, this variation is impossible to accurately predict, and requires a conservative approach in anticipating gross-level forecasts needed to demonstrate fiscal constraint.

These forecasts assume constant growth in potential revenues for all sources of funds. They also assume a constant rate of inflation calculated by using historical data obtained from cities, counties, IADOT, WIDOT, ILDOT and other sources. The future projections are calculated using linear regression method using annual growth rate and average annual funding as inputs. The projections are done for 30 years — between 2010 and 2040.

Overall DMATS will have $114,595,000 in federal and $851,430,000 in local funds.

Future Federal Funds

Table10.4 provides future federal funds for DMATS region using information from historical trends from Tables 10.1 and 10.2 on

Future Local Revenues

Table 10.5 provides future local funds for DMATS region using information from historical trends from Table 10.3.

Table 10.3 Total DMATS Non-Federal Revenues

Years	Cities				County								Total Revenue
	RUTF	Other Road Monies Receipts	Receipts, Debt Service	City Revenues	Prpty tax	L.O.S.T.	RUTF	TJ Revenue	FM Extension	Time-21	Misc. Recs.	County Revenue	
2004	$5,064,737	$9,846,950	$680,930	$15,592,617	$1,029,016	$1,275,187	$1,572,466	$0	$0	$0	$387,875	$4,264,544	$19,857,161
2005	$5,056,668	$9,004,082	$445,883	$14,506,633	$1,048,148	$1,438,845	$1,511,737	$28,557	$34,169	$0	$161,434	$4,222,888	$18,729,521
2006	$5,091,735	$8,215,878	$2,611,675	$15,919,288	$1,021,279	$1,404,141	$1,514,943	$37,268	$34,169	$0	$132,663	$4,144,462	$20,063,750
2007	$5,085,757	$8,395,819	$2,546,393	$16,027,969	$1,075,351	$1,450,247	$1,557,499	$34,679	$32,667	$0	$204,449	$4,354,890	$20,382,859
2008	$5,244,362	$7,609,960	$499,721	$13,354,043	$1,098,902	$1,541,250	$1,566,596	$34,792	$34,990	$0	$78,762	$4,355,291	$17,709,334
2009	$5,079,193	$6,220,241	$473,882	$11,773,316	$1,205,074	$1,510,455	$1,568,982	$31,819	$37,959	$5,059	$80,838	$4,440,185	$16,213,501
2010	$5,414,884	$10,014,608	$427,459	$15,856,951	$1,370,291	$1,613,365	$1,697,249	$36,280	$37,547	$28,991	$401,210	$5,184,932	$21,041,883
% Growth	1.40%	3.65%	3.65%		5.03%	4.13%	1.35%	5.87%	2.02%	20.00%	6.00%		
Annual Average	$5,148,191	$8,472,505	$1,097,992		$1,121,151	$1,461,927	$1,569,925	$33,899	$35,250	$57,981	$206,747		

Table 10.4 Future Federal Funds For DMATS region

Years	MPO Funds			Grant Programs					Discretionary	Total Revenue
	STP	MPO-TE	BR	ICAAP	State Funds	SRTS	Federal-TE	Recreational Trails	Earmarks	
2011	$1,303,000	$108,000	$536,000							$1,947,000
2012	$1,364,000	$111,000	$550,000	$500,000		$80,000				$2,605,000
2013	$1,425,000	$114,000	$564,000							$2,103,000
2014	$1,486,000	$117,000	$578,000							$2,181,000
2015	**$1,547,000**	**$120,000**	**$592,000**							**$2,259,000**
2016	$1,608,000	$123,000	$606,000	$176,000	$613,000	$4,000	$74,000			$3,204,000
2017	$1,669,000	$126,000	$620,000	$176,000	$613,000	$4,000	$74,000			$3,282,000
2018	$1,730,000	$129,000	$634,000	$176,000	$613,000	$4,000	$74,000			$3,360,000
2019	$1,791,000	$132,000	$648,000	$176,000	$613,000	$4,000	$74,000			$3,438,000
2020	**$1,852,000**	**$135,000**	**$662,000**	**$176,000**	**$613,000**	**$4,000**	**$74,000**			**$3,516,000**
2021	$1,913,000	$138,000	$676,000	$176,000	$613,000	$4,000	$74,000			$3,594,000
2022	$1,974,000	$141,000	$690,000	$176,000	$613,000	$4,000	$74,000			$3,672,000
2023	$2,035,000	$144,000	$704,000	$176,000	$613,000	$4,000	$74,000			$3,750,000
2024	$2,096,000	$147,000	$718,000	$176,000	$613,000	$4,000	$74,000			$3,828,000
2025	**$2,157,000**	**$150,000**	**$732,000**	**$176,000**	**$613,000**	**$4,000**	**$74,000**			**$3,906,000**
2026	$2,218,000	$153,000	$746,000	$176,000	$613,000	$4,000	$74,000			$3,984,000
2027	$2,279,000	$156,000	$760,000	$176,000	$613,000	$4,000	$74,000			$4,062,000
2028	$2,340,000	$159,000	$774,000	$176,000	$613,000	$4,000	$74,000			$4,140,000
2029	$2,401,000	$162,000	$788,000	$176,000	$613,000	$4,000	$74,000			$4,218,000
2030	**$2,462,000**	**$165,000**	**$802,000**	**$176,000**	**$613,000**	**$4,000**	**$74,000**			**$4,296,000**
2031	$2,523,000	$168,000	$816,000	$176,000	$613,000	$4,000	$74,000			$4,374,000
2032	$2,584,000	$171,000	$830,000	$176,000	$613,000	$4,000	$74,000			$4,452,000
2033	$2,645,000	$174,000	$844,000	$176,000	$613,000	$4,000	$74,000			$4,530,000
2034	$2,706,000	$177,000	$858,000	$176,000	$613,000	$4,000	$74,000			$4,608,000
2035	**$2,767,000**	**$180,000**	**$872,000**	**$176,000**	**$613,000**	**$4,000**	**$74,000**			**$4,686,000**
2036	$2,828,000	$183,000	$886,000	$176,000	$613,000	$4,000	$74,000			$4,764,000
2037	$2,889,000	$186,000	$900,000	$176,000	$613,000	$4,000	$74,000			$4,842,000
2038	$2,950,000	$189,000	$914,000	$176,000	$613,000	$4,000	$74,000			$4,920,000
2039	$3,011,000	$192,000	$928,000	$176,000	$613,000	$4,000	$74,000			$4,998,000
2040	**$3,072,000**	**$195,000**	**$942,000**	**$176,000**	**$613,000**	**$4,000**	**$74,000**			**$5,076,000**
Total	**$65,625,000**	**$4,545,000**	**$22,170,000**	**$4,900,000**	**$15,325,000**	**$180,000**	**$1,850,000**			**$114,595,000**

Table 10.5

Years	Cities				County								Total Revenue
	RUTF	Other Road Monies Receipts	Receipts, Debt Service	City Revenues	Prpty tax	L.O.S.T.	RUTF	TJ Revenue	FM Extension	Time-21	Misc. Recs.	County Revenue	
2011	$5,221,000	$8,782,000	$1,139,000	$15,142,000	$1,178,000	$1,523,000	$1,592,000	$36,000	$36,000	$70,000	$220,000	$4,655,000	$19,797,000
2012	$5,294,000	$9,092,000	$1,180,000	$15,566,000	$1,235,000	$1,584,000	$1,614,000	$38,000	$37,000	$82,000	$233,000	$4,823,000	$20,389,000
2013	$5,367,000	$9,402,000	$1,221,000	$15,990,000	$1,292,000	$1,645,000	$1,636,000	$40,000	$38,000	$94,000	$246,000	$4,991,000	$20,981,000
2014	$5,440,000	$9,712,000	$1,262,000	$16,414,000	$1,349,000	$1,706,000	$1,658,000	$42,000	$39,000	$106,000	$259,000	$5,159,000	$21,573,000
2015	**$5,513,000**	**$10,022,000**	**$1,303,000**	**$16,838,000**	**$1,406,000**	**$1,767,000**	**$1,680,000**	**$44,000**	**$40,000**	**$118,000**	**$272,000**	**$5,327,000**	**$22,165,000**
2016	$5,586,000	$10,332,000	$1,344,000	$17,262,000	$1,463,000	$1,828,000	$1,702,000	$46,000	$41,000	$130,000	$285,000	$5,495,000	$22,757,000
2017	$5,659,000	$10,642,000	$1,385,000	$17,686,000	$1,520,000	$1,889,000	$1,724,000	$48,000	$42,000	$142,000	$298,000	$5,663,000	$23,349,000
2018	$5,732,000	$10,952,000	$1,426,000	$18,110,000	$1,577,000	$1,950,000	$1,746,000	$50,000	$43,000	$154,000	$311,000	$5,831,000	$23,941,000
2019	$5,805,000	$11,262,000	$1,467,000	$18,534,000	$1,634,000	$2,011,000	$1,768,000	$52,000	$44,000	$166,000	$324,000	$5,999,000	$24,533,000
2020	**$5,878,000**	**$11,572,000**	**$1,508,000**	**$18,958,000**	**$1,691,000**	**$2,072,000**	**$1,790,000**	**$54,000**	**$45,000**	**$178,000**	**$337,000**	**$6,167,000**	**$25,125,000**
2021	$5,951,000	$11,882,000	$1,549,000	$19,382,000	$1,748,000	$2,133,000	$1,812,000	$56,000	$46,000	$190,000	$350,000	$6,335,000	$25,717,000
2022	$6,024,000	$12,192,000	$1,590,000	$19,806,000	$1,805,000	$2,194,000	$1,834,000	$58,000	$47,000	$202,000	$363,000	$6,503,000	$26,309,000
2023	$6,097,000	$12,502,000	$1,631,000	$20,230,000	$1,862,000	$2,255,000	$1,856,000	$60,000	$48,000	$214,000	$376,000	$6,671,000	$26,901,000
2024	$6,170,000	$12,812,000	$1,672,000	$20,654,000	$1,919,000	$2,316,000	$1,878,000	$62,000	$49,000	$226,000	$389,000	$6,839,000	$27,493,000
2025	**$6,243,000**	**$13,122,000**	**$1,713,000**	**$21,078,000**	**$1,976,000**	**$2,377,000**	**$1,900,000**	**$64,000**	**$50,000**	**$238,000**	**$402,000**	**$7,007,000**	**$28,085,000**
2026	$6,316,000	$13,432,000	$1,754,000	$21,502,000	$2,033,000	$2,438,000	$1,922,000	$66,000	$51,000	$250,000	$415,000	$7,175,000	$28,677,000
2027	$6,389,000	$13,742,000	$1,795,000	$21,926,000	$2,090,000	$2,499,000	$1,944,000	$68,000	$52,000	$262,000	$428,000	$7,343,000	$29,269,000
2028	$6,462,000	$14,052,000	$1,836,000	$22,350,000	$2,147,000	$2,560,000	$1,966,000	$70,000	$53,000	$274,000	$441,000	$7,511,000	$29,861,000
2029	$6,535,000	$14,362,000	$1,877,000	$22,774,000	$2,204,000	$2,621,000	$1,988,000	$72,000	$54,000	$286,000	$454,000	$7,679,000	$30,453,000
2030	**$6,608,000**	**$14,672,000**	**$1,918,000**	**$23,198,000**	**$2,261,000**	**$2,682,000**	**$2,010,000**	**$74,000**	**$55,000**	**$298,000**	**$467,000**	**$7,847,000**	**$31,045,000**
2031	$6,681,000	$14,982,000	$1,959,000	$23,622,000	$2,318,000	$2,743,000	$2,032,000	$76,000	$56,000	$310,000	$480,000	$8,015,000	$31,637,000
2032	$6,754,000	$15,292,000	$2,000,000	$24,046,000	$2,375,000	$2,804,000	$2,054,000	$78,000	$57,000	$322,000	$493,000	$8,183,000	$32,229,000
2033	$6,827,000	$15,602,000	$2,041,000	$24,470,000	$2,432,000	$2,865,000	$2,076,000	$80,000	$58,000	$334,000	$506,000	$8,351,000	$32,821,000
2034	$6,900,000	$15,912,000	$2,082,000	$24,894,000	$2,489,000	$2,926,000	$2,098,000	$82,000	$59,000	$346,000	$519,000	$8,519,000	$33,413,000
2035	**$6,973,000**	**$16,222,000**	**$2,123,000**	**$25,318,000**	**$2,546,000**	**$2,987,000**	**$2,120,000**	**$84,000**	**$60,000**	**$358,000**	**$532,000**	**$8,687,000**	**$34,005,000**
2036	$7,046,000	$16,532,000	$2,164,000	$25,742,000	$2,603,000	$3,048,000	$2,142,000	$86,000	$61,000	$370,000	$545,000	$8,855,000	$34,597,000
2037	$7,119,000	$16,842,000	$2,205,000	$26,166,000	$2,660,000	$3,109,000	$2,164,000	$88,000	$62,000	$382,000	$558,000	$9,023,000	$35,189,000
2038	$7,192,000	$17,152,000	$2,246,000	$26,590,000	$2,717,000	$3,170,000	$2,186,000	$90,000	$63,000	$394,000	$571,000	$9,191,000	$35,781,000
2039	$7,265,000	$17,462,000	$2,287,000	$27,014,000	$2,774,000	$3,231,000	$2,208,000	$92,000	$64,000	$406,000	$584,000	$9,359,000	$36,373,000
2040	$7,338,000	$17,772,000	$2,328,000	$27,438,000	$2,831,000	$3,292,000	$2,230,000	$94,000	$65,000	$418,000	$597,000	$9,527,000	**$36,965,000**
Total	**$188,385,000**	**$398,310,000**	**$52,005,000**	**$638,700,000**	**$60,135,000**	**$72,225,000**	**$57,330,000**	**$1,950,000**	**$1,515,000**	**$7,320,000**	**$12,255,000**	**$212,730,000**	**$851,430,000**

Operation & Maintenance Cost Projections:

The Federal Highway Administration (FHWA) has placed great emphasis on the region to demonstrate that there are adequate revenues available to ensure the region's ability to fund operations and maintenance (O&M) of the transportation system. Staff defines the region's highway transportation system as roadways eligible for federal funding (federal aid system). The lack of current system condition information has made establishing an appropriate regional O&M cost difficult. To overcome the difficulty, the plan takes a conservative approach to O&M estimates based on inputs from the state departments of transportation regarding O&M.

Operation costs include costs associated with snow removal, street lighting, equipment purchases, administration, and other related costs. Maintenance costs include costs associated with maintaining the existing physical infrastructure (i.e., pavement, signals, right-of-way).

Table 10.6 provides the historical Operation & Maintenance cost for DMATS Area.

Table 10.6

Years	Cities		County		Total O&M cost		Total Expenditure
	Total Maintenance	Total Operations	Total Maintenance	Total Operations	Total Maintenance	Total Operations	
2004	$1,323,032	$2,794,753	$1,034,241	$1,446,111	$2,357,273	$4,240,864	$6,598,137
2005	$810,517	$4,239,324	$1,249,935	$1,747,702	$2,060,452	$5,987,026	$8,047,478
2006	$3,165,707	$2,137,273	$1,203,225	$1,682,390	$4,368,932	$3,819,663	$8,188,595
2007	$3,163,145	$1,820,007	$1,039,706	$1,453,752	$4,202,851	$3,273,759	$7,476,610
2008	$2,416,936	$2,722,730	$1,497,060	$1,752,528	$3,913,996	$4,475,258	$8,389,253
2009	$4,619,898	$2,430,052	$1,336,636	$1,844,637	$5,956,534	$4,274,689	$10,231,223
2010	$4,036,404	$2,379,505	$1,381,407	$1,931,531	$5,417,811	$4,311,036	$9,728,847
% Growth Rate	5.70%	5.02%	5.70%	5.02%			
Annual Average	$2,790,806	$2,646,235	$2,316,115	$3,165,471			

Future Operation & Maintenance Cost Projections:

The future O&M costs are developed using Linear Regression method with annual growth rate and average annual funding as inputs. The annual growth rate and average annual funding is calculated from historic data provided by cities and counties in the region. Overall the region needs $599,595,000 in O&M for next 30 years. See Table 10.7.

Funds available to implement projects:

In order to find out the amount of funding available to implement future projects, O&M costs are subtracted from projected federal and local funding. Table 10.8 provides the future funding available project implementation. Overall the region has $366,430,000 to implement projects.

Table 10.7 Future Operation & Maintenance Costs

Years	Cities			County			Total		Total Expenditure
	Total Maintenance cost	Total Operations Cost	Total Cost	Total Maintenance cost	Total Operations Cost	Total Cost	Total Maintenance cost	Total Operations Cost	
2011	$2,950,000	$2,780,000	$5,730,000	$2,449,000	$3,325,000	$5,774,000	$5,399,000	$6,105,000	$11,504,000
2012	$3,110,000	$2,913,000	$6,023,000	$2,582,000	$3,484,000	$6,066,000	$5,692,000	$6,397,000	$12,089,000
2013	$3,270,000	$3,046,000	$6,316,000	$2,715,000	$3,643,000	$6,358,000	$5,985,000	$6,689,000	$12,674,000
2014	$3,430,000	$3,179,000	$6,609,000	$2,848,000	$3,802,000	$6,650,000	$6,278,000	$6,981,000	$13,259,000
2015	**$3,590,000**	**$3,312,000**	**$6,902,000**	**$2,981,000**	**$3,961,000**	**$6,942,000**	**$6,571,000**	**$7,273,000**	**$13,844,000**
2016	$3,750,000	$3,445,000	$7,195,000	$3,114,000	$4,120,000	$7,234,000	$6,864,000	$7,565,000	$14,429,000
2017	$3,910,000	$3,578,000	$7,488,000	$3,247,000	$4,279,000	$7,526,000	$7,157,000	$7,857,000	$15,014,000
2018	$4,070,000	$3,711,000	$7,781,000	$3,380,000	$4,438,000	$7,818,000	$7,450,000	$8,149,000	$15,599,000
2019	$4,230,000	$3,844,000	$8,074,000	$3,513,000	$4,597,000	$8,110,000	$7,743,000	$8,441,000	$16,184,000
2020	**$4,390,000**	**$3,977,000**	**$8,367,000**	**$3,646,000**	**$4,756,000**	**$8,402,000**	**$8,036,000**	**$8,733,000**	**$16,769,000**
2021	$4,550,000	$4,110,000	$8,660,000	$3,779,000	$4,915,000	$8,694,000	$8,329,000	$9,025,000	$17,354,000
2022	$4,710,000	$4,243,000	$8,953,000	$3,912,000	$5,074,000	$8,986,000	$8,622,000	$9,317,000	$17,939,000
2023	$4,870,000	$4,376,000	$9,246,000	$4,045,000	$5,233,000	$9,278,000	$8,915,000	$9,609,000	$18,524,000
2024	$5,030,000	$4,509,000	$9,539,000	$4,178,000	$5,392,000	$9,570,000	$9,208,000	$9,901,000	$19,109,000
2025	**$5,190,000**	**$4,642,000**	**$9,832,000**	**$4,311,000**	**$5,551,000**	**$9,862,000**	**$9,501,000**	**$10,193,000**	**$19,694,000**
2026	$5,350,000	$4,775,000	$10,125,000	$4,444,000	$5,710,000	$10,154,000	$9,794,000	$10,485,000	$20,279,000
2027	$5,510,000	$4,908,000	$10,418,000	$4,577,000	$5,869,000	$10,446,000	$10,087,000	$10,777,000	$20,864,000
2028	$5,670,000	$5,041,000	$10,711,000	$4,710,000	$6,028,000	$10,738,000	$10,380,000	$11,069,000	$21,449,000
2029	$5,830,000	$5,174,000	$11,004,000	$4,843,000	$6,187,000	$11,030,000	$10,673,000	$11,361,000	$22,034,000
2030	**$5,990,000**	**$5,307,000**	**$11,297,000**	**$4,976,000**	**$6,346,000**	**$11,322,000**	**$10,966,000**	**$11,653,000**	**$22,619,000**
2031	$6,150,000	$5,440,000	$11,590,000	$5,109,000	$6,505,000	$11,614,000	$11,259,000	$11,945,000	$23,204,000
2032	$6,310,000	$5,573,000	$11,883,000	$5,242,000	$6,664,000	$11,906,000	$11,552,000	$12,237,000	$23,789,000
2033	$6,470,000	$5,706,000	$12,176,000	$5,375,000	$6,823,000	$12,198,000	$11,845,000	$12,529,000	$24,374,000
2034	$6,630,000	$5,839,000	$12,469,000	$5,508,000	$6,982,000	$12,490,000	$12,138,000	$12,821,000	$24,959,000
2035	**$6,790,000**	**$5,972,000**	**$12,762,000**	**$5,641,000**	**$7,141,000**	**$12,782,000**	**$12,431,000**	**$13,113,000**	**$25,544,000**
2036	$6,950,000	$6,105,000	$13,055,000	$5,774,000	$7,300,000	$13,074,000	$12,724,000	$13,405,000	$26,129,000
2037	$7,110,000	$6,238,000	$13,348,000	$5,907,000	$7,459,000	$13,366,000	$13,017,000	$13,697,000	$26,714,000
2038	$7,270,000	$6,371,000	$13,641,000	$6,040,000	$7,618,000	$13,658,000	$13,310,000	$13,989,000	$27,299,000
2039	$7,430,000	$6,504,000	$13,934,000	$6,173,000	$7,777,000	$13,950,000	$13,603,000	$14,281,000	$27,884,000
2040	**$7,590,000**	**$6,637,000**	**$14,227,000**	**$6,306,000**	**$7,936,000**	**$14,242,000**	**$13,896,000**	**$14,573,000**	**$28,469,000**
Total	**$158,100,000**	**$141,255,000**	**$299,355,000**	**$131,325,000**	**$168,915,000**	**$300,240,000**	**$289,425,000**	**$310,170,000**	**$599,595,000**

Table 10.8 Funds available to implement projects

Years	Cities			County			Total			Total
	Non Federal Revenue	Operation & Maintiance cost	Revenue - Cost	Non Federal Revenue	Operation & Maintiance cost	Revenue - Cost	Federal Revenue	Non Federal Revenue	Operation & Maintiance cost	
2011	$15,142,000	$5,730,000	$9,412,000	$4,655,000	$5,774,000	$1,119,000	$1,947,000	$19,797,000	$11,504,000	$10,240,000
2012	$15,566,000	$6,023,000	$9,543,000	$4,823,000	$6,066,000	$1,243,000	$2,605,000	$20,389,000	$12,089,000	$10,905,000
2013	$15,990,000	$6,316,000	$9,674,000	$4,991,000	$6,358,000	$1,367,000	$2,103,000	$20,981,000	$12,674,000	$10,410,000
2014	$16,414,000	$6,609,000	$9,805,000	$5,159,000	$6,650,000	$1,491,000	$2,181,000	$21,573,000	$13,259,000	$10,495,000
2015	**$16,838,000**	**$6,902,000**	**$9,936,000**	**$5,327,000**	**$6,942,000**	**$1,615,000**	**$2,259,000**	**$22,165,000**	**$13,844,000**	**$10,580,000**
2016	$17,262,000	$7,195,000	$10,067,000	$5,495,000	$7,234,000	$1,739,000	$3,204,000	$22,757,000	$14,429,000	$11,532,000
2017	$17,686,000	$7,488,000	$10,198,000	$5,663,000	$7,526,000	$1,863,000	$3,282,000	$23,349,000	$15,014,000	$11,617,000
2018	$18,110,000	$7,781,000	$10,329,000	$5,831,000	$7,818,000	$1,987,000	$3,360,000	$23,941,000	$15,599,000	$11,702,000
2019	$18,534,000	$8,074,000	$10,460,000	$5,999,000	$8,110,000	$2,111,000	$3,438,000	$24,533,000	$16,184,000	$11,787,000
2020	**$18,958,000**	**$8,367,000**	**$10,591,000**	**$6,167,000**	**$8,402,000**	**$2,235,000**	**$3,516,000**	**$25,125,000**	**$16,769,000**	**$11,872,000**
2021	$19,382,000	$8,660,000	$10,722,000	$6,335,000	$8,694,000	$2,359,000	$3,594,000	$25,717,000	$17,354,000	$11,957,000
2022	$19,806,000	$8,953,000	$10,853,000	$6,503,000	$8,986,000	$2,483,000	$3,672,000	$26,309,000	$17,939,000	$12,042,000
2023	$20,230,000	$9,246,000	$10,984,000	$6,671,000	$9,278,000	$2,607,000	$3,750,000	$26,901,000	$18,524,000	$12,127,000
2024	$20,654,000	$9,539,000	$11,115,000	$6,839,000	$9,570,000	$2,731,000	$3,828,000	$27,493,000	$19,109,000	$12,212,000
2025	**$21,078,000**	**$9,832,000**	**$11,246,000**	**$7,007,000**	**$9,862,000**	**$2,855,000**	**$3,906,000**	**$28,085,000**	**$19,694,000**	**$12,297,000**
2026	$21,502,000	$10,125,000	$11,377,000	$7,175,000	$10,154,000	$2,979,000	$3,984,000	$28,677,000	$20,279,000	$12,382,000
2027	$21,926,000	$10,418,000	$11,508,000	$7,343,000	$10,446,000	$3,103,000	$4,062,000	$29,269,000	$20,864,000	$12,467,000
2028	$22,350,000	$10,711,000	$11,639,000	$7,511,000	$10,738,000	$3,227,000	$4,140,000	$29,861,000	$21,449,000	$12,552,000
2029	$22,774,000	$11,004,000	$11,770,000	$7,679,000	$11,030,000	$3,351,000	$4,218,000	$30,453,000	$22,034,000	$12,637,000
2030	**$23,198,000**	**$11,297,000**	**$11,901,000**	**$7,847,000**	**$11,322,000**	**$3,475,000**	**$4,296,000**	**$31,045,000**	**$22,619,000**	**$12,722,000**
2031	$23,622,000	$11,590,000	$12,032,000	$8,015,000	$11,614,000	$3,599,000	$4,374,000	$31,637,000	$23,204,000	$12,807,000
2032	$24,046,000	$11,883,000	$12,163,000	$8,183,000	$11,906,000	$3,723,000	$4,452,000	$32,229,000	$23,789,000	$12,892,000
2033	$24,470,000	$12,176,000	$12,294,000	$8,351,000	$12,198,000	$3,847,000	$4,530,000	$32,821,000	$24,374,000	$12,977,000
2034	$24,894,000	$12,469,000	$12,425,000	$8,519,000	$12,490,000	$3,971,000	$4,608,000	$33,413,000	$24,959,000	$13,062,000
2035	**$25,318,000**	**$12,762,000**	**$12,556,000**	**$8,687,000**	**$12,782,000**	**$4,095,000**	**$4,686,000**	**$34,005,000**	**$25,544,000**	**$13,147,000**
2036	$25,742,000	$13,055,000	$12,687,000	$8,855,000	$13,074,000	$4,219,000	$4,764,000	$34,597,000	$26,129,000	$13,232,000
2037	$26,166,000	$13,348,000	$12,818,000	$9,023,000	$13,366,000	$4,343,000	$4,842,000	$35,189,000	$26,714,000	$13,317,000
2038	$26,590,000	$13,641,000	$12,949,000	$9,191,000	$13,658,000	$4,467,000	$4,920,000	$35,781,000	$27,299,000	$13,402,000
2039	$27,014,000	$13,934,000	$13,080,000	$9,359,000	$13,950,000	$4,591,000	$4,998,000	$36,373,000	$27,884,000	$13,487,000
2040	**$27,438,000**	**$14,227,000**	**$13,211,000**	**$9,527,000**	**$14,242,000**	**$4,715,000**	**$5,076,000**	**$36,965,000**	**$28,469,000**	**$13,572,000**
Total	**$638,700,000**	**$299,355,000**	**$339,345,000**	**$212,730,000**	**$300,240,000**	**-$87,510,000**	**$114,595,000**	**$851,430,000**	**$599,595,000**	**$366,430,000**

Transit Funding Programs

The FTA provides funding to Iowa DOT, Iowa's MPOs and RPAs, and public transit providers to support public transit operations.

Metropolitan Planning Program (Section 5303)

The FTA provides this funding to support planning activities in metropolitan areas. Iowa DOT is the direct recipient of 5303 funds. The Iowa DOT allocates 5303 funds to MPOs based on a formula that distributes one-third of the funds based on the 1990 urban area population, one-third of the funds based on the 2000 urban area population, and the last one-third equally distributed. Iowa DOT administers 5303 funds jointly with Metropolitan Planning "PL" funds, available through FHWA, as part of a Consolidated Planning Grant. The 5303 and PL funds can support any MPO costs related to intermodal transportation planning activities for the urbanized area.

Funding Estimate: The DMATS area received $33,676 in section 5303 funding each year from 2006 to 2010. The funding has 0% growth rate.

Urbanized Area Formula Program (Section 5307)

This program supports urban transit systems serving communities over 50,000 in population. The FTA allocates funding partially on population and population density and partially on performance factors, including passenger miles of service provided.

Funding Estimate: The Jule Transit received $3,575,921 in section 5307 funding from 2006 to 2010. The system received an annual average of $715,184 and a growth rate of 56%. Staff used 3% as annual growth rate for future projections.

Capital Investment Program (Section 5309)

Section 5309 is a discretionary funding source that supports transit capital needs that exceed what federal formula programs can support.

Funding Estimate: The local transit systems received $1,002,904 in section 5309 funding for years 2006, 2008, 2009 and 2010. The system received an annual average of $200,581 and a growth rate of 42%. Staff used 3% as annual growth rate for future projections.

Special Needs Program (Section 5310)

Section 5310 supports transit services serving persons who are elderly or persons with disabilities. FTA allocates these funds to Iowa based on the number of persons who are elderly or have disabilities within the state compared to other states.

Funding Estimate: The local transit systems received $1,008,910 in section 5310 funding from 2006 to 2010. The system received an annual average of $217,782 and a growth rate of 27.43%. Staff used 3% as annual growth rate for future projections.

Non-Urbanized Area Formula Program (Section 5311)

Section 5311 supports transit services in rural areas and in non-urbanized areas under 50,000 in population. FTA provides funding to each state based on the percentage of each state's population living outside of urbanized areas.

Job Access and Reverse Commute Program (JARC) (Section 5316)

FTA established the JARC program to provide transportation services to access employment opportunities and support services (such as training and child care) for welfare recipients and low-income individuals. FTA bases federal apportionments on census data concerning the number of low-income individuals in each state.

New Freedom Program (Section 5317)

This program supports new services or accommodations for persons with disabilities that go beyond the minimums established by the rules implementing the ADA. FTA bases federal apportionments on census data concerning the number of persons with disabilities in each state.

Surface Transportation Program (STP)

As noted previously under highway funding programs, STP funds may be used for transit capital projects.

Funding Estimate: The local transit systems did not receive any STP funds from State or MPO.

Congestion Mitigation/Air Quality (CMAQ)

As noted previously under highway funding programs, CMAQ/ICAAP funds may be used for anything that the STP may fund, including transit capital projects.

Funding Estimate: The local transit systems received ICAAP funding in 2008 and 2010. The area received a total funding of $384,160. Future estimates are not done for these funds as they are grant based.

Public Transit Infrastructure Grant (PTI)

Iowa DOT provides this program to fund vertical infrastructure needs of public transit agencies. Iowa DOT defines vertical infrastructure as buildings and facilities, but not vehicles. Projects can include new construction, reconstruction, or remodeling.

Funding Estimate: The RTA system received PTI funding in 2009. The system received a total funding of $880,000. Future estimate is not done for these funds as they are grant based.

State Transit Assistance (STA)

All public transit systems in Iowa are eligible for funding under the STA program. STA funding is derived from four percent of the fees for new registration collected on sales of motor vehicle and accessory equipment.

Funding Estimate: The local transit systems have STA funding history from 2006 to 2010. Future year of expenditure funding was based on linear regression between 2010 and 2040. ($13 Million – year of expenditure dollars) with an annual average of $431,979 and growth rate of -4.52%. Staff used 0% as annual growth rate for future projections.

STA Special Projects

Each year up to $300,000 of the total STA funds are set aside to fund "special projects." These can include grants to individual systems to support transit services which are developed in conjunction with human service agencies, or statewide projects to improve public transit in Iowa through such means as technical training for transit system or planning agency personnel, statewide marketing campaigns, etc.

Funding Estimate: The local transit systems have received STA Special Project funding in 2009 and 2010. The system received a total funding of $121,800. Future estimates are not done for these funds as they are grant based.

Transit Levy

Iowa law authorizes municipalities to levy up to 95 cents per $1,000 of assessed taxable property in order to support the cost of a public transit system. Most of Iowa's larger communities levy for support of their urban transit systems. A number of smaller communities use this authority to generate funding used to support services contracted from their designated regional transit system. Exhibit 5 shows which communities are currently using the levy authority and how much is being generated.

Funding Estimate: The local transit systems receive Transit Levy funding every year. The systems receive an average annual funding of $1,055,554 with a annual growth of 17.08%. Staff used 3% as annual growth rate for future projections.

Fares

Fees paid by the passengers are one of the most common sources of local support. This can include monies collected on-board the transit vehicle (usually called "farebox receipts"), as well as prepaid fares from sale of passes or tickets, or fares billed to the passenger after the fact.

Funding Estimate: The local transit systems on an average received $358,994 in fares annually. The systems had a negative annual growth in fares. Staff used 0% as annual growth rate for future projections.

Advertising & Miscellaneous

These are the funds that are locally generated. Miscellaneous funds have bigger balance than fares and advertising as they are based on local grant funds and other revenues.

Funding Estimate: The local transit systems on a average received $11,813 in advertising and $529,577 in miscellaneous funds. The systems had a positive annual growth in advertising and miscellaneous funds. Staff used 4% as annual growth rate for future projections.

Transit Revenue, Operations & Maintenance Cost:

Table 10.9 provides the historical funds received by Jule (formerly Keyline) and RTA from 2006 to 2010. The analysis also provides information on federal and state grant funds. These funding sources will not be used to do future analysis. Growth rate has been assigned to each funding using linear regression method. The growth rate is used to project future funding for the area. Table 10.10 provides the historic Operation & Maintenance cost for the transit systems. Transit system staff decided to use 2.3% annual growth rate for O&M even though the maximum % growth is at 2.29%. The staff felt that the costs will increase with fuel and labor costs.

Tables 10.11 and 10.12 are future projections of the local transit system. Overall the Local systems had $146,640,000 in revenue and $143,535,000 in Operation & Maintenance cost from 2010 to 2040

Table 10.9 Historic Transit Revenues

Funding Source	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	Average Annual
Capital						
Section 5307	$91,760	$100,762	$0	$0	$0	$38,504
Section 5309	$436,479	$0	$313,325	$58,100	$195,000	$200,581
Infrastructure Grant	$0	$0	$0	$880,000	$0	$176,000
Federal & State Grants	$0	$0	$0	$537,500	$44,800	$116,460
Operations						$0
Section 5303	$33,676	$33,676	$33,676	$33,676	$33,676	$33,676
Section 5307	$1,173,436	$909,175	$186,461	$947,561	$166,766	$676,680
Section 5310	$127,098	$146,784	$296,351	$248,999	$269,678	$217,782
CMAQ /ICAAP	$0	$0	$84,000	$0	$300,160	$76,832
STA	$464,386	$422,067	$465,688	$427,675	$380,077	$431,979
STA Special	$0	$0	$0	$6,400	$115,400	$24,360
Transit Levy	$710,543	$923,384	$1,070,053	$1,253,638	$1,320,153	$1,055,554
Fares	$463,700	$398,508	$318,510	$299,607	$314,644	$358,994
Advertising	$11,250	$10,408	$12,108	$11,667	$13,632	$11,813
Investment	$0	$5,285	$0	$0	$0	$1,057
Miscellaneous	$382,422	$474,795	$552,322	$563,071	$675,276	$529,577

Table10.10 Historic Transit Operation & Maintenance Costs

Year	Jule		RTA		Total		Total Cost
	Operations	Maintanance	Operations	Maintanance	Operations	Maintanance	
2006	$2,146,311	$530,436	$562,904	$57,640	$2,709,215	$588,076	$3,297,291
2007	$2,076,334	$530,436	$685,375	$57,640	$2,761,709	$588,076	$3,349,785
2008	$2,436,651	$530,436	$798,774	$57,640	$3,235,425	$588,076	$3,823,501
2009	$2,296,787	$530,436	$708,404	$57,640	$3,005,191	$588,076	$3,593,267
2010	$2,165,779	$530,436	$678,167	$57,640	$2,843,946	$588,076	$3,432,022
% annual growth	2.29%	0.00%	-5.20%	0.00%	0.68%	0.00%	
Average Annual	$2,224,372	$530,436	$686,725	$57,640	$2,911,097	$588,076	

Table 10.11 Transit Revenue projections

Years	Captial		Operations								Total Revenue
	Section 5307	Section 5309	Section 5303	Section 5307	Section 5310	STA	Transit Levy	Fares	Advertising	Miscellaneous	
2011	$40,000	$207,000	$34,000	$697,000	$225,000	$432,000	$1,088,000	$359,000	$13,000	$546,000	$3,641,000
2012	$42,000	$214,000	$34,000	$718,000	$232,000	$432,000	$1,120,000	$359,000	$14,000	$562,000	$3,727,000
2013	$44,000	$221,000	$34,000	$739,000	$239,000	$432,000	$1,152,000	$359,000	$15,000	$578,000	$3,813,000
2014	$46,000	$228,000	$34,000	$760,000	$246,000	$432,000	$1,184,000	$359,000	$16,000	$594,000	$3,899,000
2015	**$48,000**	**$235,000**	**$34,000**	**$781,000**	**$253,000**	**$432,000**	**$1,216,000**	**$359,000**	**$17,000**	**$610,000**	**$3,985,000**
2016	$50,000	$242,000	$34,000	$802,000	$260,000	$432,000	$1,248,000	$359,000	$18,000	$626,000	$4,071,000
2017	$52,000	$249,000	$34,000	$823,000	$267,000	$432,000	$1,280,000	$359,000	$19,000	$642,000	$4,157,000
2018	$54,000	$256,000	$34,000	$844,000	$274,000	$432,000	$1,312,000	$359,000	$20,000	$658,000	$4,243,000
2019	$56,000	$263,000	$34,000	$865,000	$281,000	$432,000	$1,344,000	$359,000	$21,000	$674,000	$4,329,000
2020	**$58,000**	**$270,000**	**$34,000**	**$886,000**	**$288,000**	**$432,000**	**$1,376,000**	**$359,000**	**$22,000**	**$690,000**	**$4,415,000**
2021	$60,000	$277,000	$34,000	$907,000	$295,000	$432,000	$1,408,000	$359,000	$23,000	$706,000	$4,501,000
2022	$62,000	$284,000	$34,000	$928,000	$302,000	$432,000	$1,440,000	$359,000	$24,000	$722,000	$4,587,000
2023	$64,000	$291,000	$34,000	$949,000	$309,000	$432,000	$1,472,000	$359,000	$25,000	$738,000	$4,673,000
2024	$66,000	$298,000	$34,000	$970,000	$316,000	$432,000	$1,504,000	$359,000	$26,000	$754,000	$4,759,000
2025	**$68,000**	**$305,000**	**$34,000**	**$991,000**	**$323,000**	**$432,000**	**$1,536,000**	**$359,000**	**$27,000**	**$770,000**	**$4,845,000**
2026	$70,000	$312,000	$34,000	$1,012,000	$330,000	$432,000	$1,568,000	$359,000	$28,000	$786,000	$4,931,000
2027	$72,000	$319,000	$34,000	$1,033,000	$337,000	$432,000	$1,600,000	$359,000	$29,000	$802,000	$5,017,000
2028	$74,000	$326,000	$34,000	$1,054,000	$344,000	$432,000	$1,632,000	$359,000	$30,000	$818,000	$5,103,000
2029	$76,000	$333,000	$34,000	$1,075,000	$351,000	$432,000	$1,664,000	$359,000	$31,000	$834,000	$5,189,000
2030	**$78,000**	**$340,000**	**$34,000**	**$1,096,000**	**$358,000**	**$432,000**	**$1,696,000**	**$359,000**	**$32,000**	**$850,000**	**$5,275,000**
2031	$80,000	$347,000	$34,000	$1,117,000	$365,000	$432,000	$1,728,000	$359,000	$33,000	$866,000	$5,361,000
2032	$82,000	$354,000	$34,000	$1,138,000	$372,000	$432,000	$1,760,000	$359,000	$34,000	$882,000	$5,447,000
2033	$84,000	$361,000	$34,000	$1,159,000	$379,000	$432,000	$1,792,000	$359,000	$35,000	$898,000	$5,533,000
2034	$86,000	$368,000	$34,000	$1,180,000	$386,000	$432,000	$1,824,000	$359,000	$36,000	$914,000	$5,619,000
2035	**$88,000**	**$375,000**	**$34,000**	**$1,201,000**	**$393,000**	**$432,000**	**$1,856,000**	**$359,000**	**$37,000**	**$930,000**	**$5,705,000**
2036	$90,000	$382,000	$34,000	$1,222,000	$400,000	$432,000	$1,888,000	$359,000	$38,000	$946,000	$5,791,000
2037	$92,000	$389,000	$34,000	$1,243,000	$407,000	$432,000	$1,920,000	$359,000	$39,000	$962,000	$5,877,000
2038	$94,000	$396,000	$34,000	$1,264,000	$414,000	$432,000	$1,952,000	$359,000	$40,000	$978,000	$5,963,000
2039	$96,000	$403,000	$34,000	$1,285,000	$421,000	$432,000	$1,984,000	$359,000	$41,000	$994,000	$6,049,000
2040	**$98,000**	**$410,000**	**$34,000**	**$1,306,000**	**$428,000**	**$432,000**	**$2,016,000**	**$359,000**	**$42,000**	**$1,010,000**	**$6,135,000**
Total	**$2,070,000**	**$9,255,000**	**$1,020,000**	**$30,045,000**	**$9,795,000**	**$12,960,000**	**$46,560,000**	**$10,770,000**	**$825,000**	**$23,340,000**	**$146,640,000**

Table 10.12 Transit Operations & Maintenance Projections

Years	Jule		RTA		Total		Total Cost
	Operations	Maintanance	Operations	Maintanance	Operations	Maintnanace	
2011	$2,276,000	$543,000	$703,000	$59,000	$2,979,000	$602,000	$3,581,000
2012	$2,328,000	$556,000	$719,000	$61,000	$3,047,000	$617,000	$3,664,000
2013	$2,380,000	$569,000	$735,000	$63,000	$3,115,000	$632,000	$3,747,000
2014	$2,432,000	$582,000	$751,000	$65,000	$3,183,000	$647,000	$3,830,000
2015	**$2,484,000**	**$595,000**	**$767,000**	**$67,000**	**$3,251,000**	**$662,000**	**$3,913,000**
2016	$2,536,000	$608,000	$783,000	$69,000	$3,319,000	$677,000	$3,996,000
2017	$2,588,000	$621,000	$799,000	$71,000	$3,387,000	$692,000	$4,079,000
2018	$2,640,000	$634,000	$815,000	$73,000	$3,455,000	$707,000	$4,162,000
2019	$2,692,000	$647,000	$831,000	$75,000	$3,523,000	$722,000	$4,245,000
2020	**$2,744,000**	**$660,000**	**$847,000**	**$77,000**	**$3,591,000**	**$737,000**	**$4,328,000**
2021	$2,796,000	$673,000	$863,000	$79,000	$3,659,000	$752,000	$4,411,000
2022	$2,848,000	$686,000	$879,000	$81,000	$3,727,000	$767,000	$4,494,000
2023	$2,900,000	$699,000	$895,000	$83,000	$3,795,000	$782,000	$4,577,000
2024	$2,952,000	$712,000	$911,000	$85,000	$3,863,000	$797,000	$4,660,000
2025	**$3,004,000**	**$725,000**	**$927,000**	**$87,000**	**$3,931,000**	**$812,000**	**$4,743,000**
2026	$3,056,000	$738,000	$943,000	$89,000	$3,999,000	$827,000	$4,826,000
2027	$3,108,000	$751,000	$959,000	$91,000	$4,067,000	$842,000	$4,909,000
2028	$3,160,000	$764,000	$975,000	$93,000	$4,135,000	$857,000	$4,992,000
2029	$3,212,000	$777,000	$991,000	$95,000	$4,203,000	$872,000	$5,075,000
2030	**$3,264,000**	**$790,000**	**$1,007,000**	**$97,000**	**$4,271,000**	**$887,000**	**$5,158,000**
2031	$3,316,000	$803,000	$1,023,000	$99,000	$4,339,000	$902,000	$5,241,000
2032	$3,368,000	$816,000	$1,039,000	$101,000	$4,407,000	$917,000	$5,324,000
2033	$3,420,000	$829,000	$1,055,000	$103,000	$4,475,000	$932,000	$5,407,000
2034	$3,472,000	$842,000	$1,071,000	$105,000	$4,543,000	$947,000	$5,490,000
2035	**$3,524,000**	**$855,000**	**$1,087,000**	**$107,000**	**$4,611,000**	**$962,000**	**$5,573,000**
2036	$3,576,000	$868,000	$1,103,000	$109,000	$4,679,000	$977,000	$5,656,000
2037	$3,628,000	$881,000	$1,119,000	$111,000	$4,747,000	$992,000	$5,739,000
2038	$3,680,000	$894,000	$1,135,000	$113,000	$4,815,000	$1,007,000	$5,822,000
2039	$3,732,000	$907,000	$1,151,000	$115,000	$4,883,000	$1,022,000	$5,905,000
2040	**$3,784,000**	**$920,000**	**$1,167,000**	**$117,000**	**$4,951,000**	**$1,037,000**	**$5,988,000**
Total	**$90,900,000**	**$21,945,000**	**$28,050,000**	**$2,640,000**	**$118,950,000**	**$24,585,000**	**$143,535,000**

Funds available to implement transit projects:

In order to find out the amount of funding available to implement the projects the future O&M costs are subtracted from future federal and local funding. Table 10.13 will provide the available future funding for project implementation. The entire region will have $3,105,000 to do transit projects.

Table 10.13 Funds available to implement transit projects

Years	Transit systems		
	Revenue	Cost (O&M)	Revenue - Cost
2011	$3,641,000	$3,581,000	$60,000
2012	$3,727,000	$3,664,000	$63,000
2013	$3,813,000	$3,747,000	$66,000
2014	$3,899,000	$3,830,000	$69,000
2015	**$3,985,000**	**$3,913,000**	**$72,000**
2016	$4,071,000	$3,996,000	$75,000
2017	$4,157,000	$4,079,000	$78,000
2018	$4,243,000	$4,162,000	$81,000
2019	$4,329,000	$4,245,000	$84,000
2020	**$4,415,000**	**$4,328,000**	**$87,000**
2021	$4,501,000	$4,411,000	$90,000
2022	$4,587,000	$4,494,000	$93,000
2023	$4,673,000	$4,577,000	$96,000
2024	$4,759,000	$4,660,000	$99,000
2025	**$4,845,000**	**$4,743,000**	**$102,000**
2026	$4,931,000	$4,826,000	$105,000
2027	$5,017,000	$4,909,000	$108,000
2028	$5,103,000	$4,992,000	$111,000
2029	$5,189,000	$5,075,000	$114,000
2030	**$5,275,000**	**$5,158,000**	**$117,000**
2031	$5,361,000	$5,241,000	$120,000
2032	$5,447,000	$5,324,000	$123,000
2033	$5,533,000	$5,407,000	$126,000
2034	$5,619,000	$5,490,000	$129,000
2035	**$5,705,000**	**$5,573,000**	**$132,000**
2036	$5,791,000	$5,656,000	$135,000
2037	$5,877,000	$5,739,000	$138,000
2038	$5,963,000	$5,822,000	$141,000
2039	$6,049,000	$5,905,000	$144,000
2040	**$6,135,000**	**$5,988,000**	**$147,000**
Total	**$146,640,000**	**$143,535,000**	**$3,105,000**

The entire region will have $364 million that can be spent on roads, bridges and trails over 30 years. The local transit systems will also have $3 million for transit improvements. The financial analysis does not explicitly address other transportation modes such as bicycle, pedestrian and goods movement in the financial analysis. Although LRTP 2040 currently identifies specific projects in these categories, there are no dedicated funding sources for project development other than enhancement dollars for trails which will not be sufficient. Projects compete for the same funding sources identified in this analysis, particularly federal highway funds. Bikeway and pedestrian improvements may also be incorporated in other highway or transit projects.

Model Calibration and Validation

Trip Generation

The purpose of trip generation is to create trip productions and attractions, validation includes internal trips, balancing trip productions as well as attractions.

Internal Trips

Several reasonable checks were run on socioeconomic data. As shown in Tables 11.11 and 11.22, the average motorized person trips per household were compared to other areas. This helps determine the rate, data was also averaged from zones with no employment. The DMATS area model has 8.75 motorized trips per household, which was determined reasonable when compared with other urban areas.

Table 11.1 Average Motorized Person Trips per Household by Region

Region	Survey Year	Population	Vehicle Trips/HH
Dubuque	2010 Model	83,056	8.75
Reno, NV	1987	254,000	8.58
Vancouver, WA	1985	259,000	5.83
Charlotte, NC	1985	511,433	9.29

Table 11.2 DMATS Average Motorized Person Trips per Household Purpose

Purpose	Dubuque	Houston	Dallas/Ft. Worth	Denver	San Francisco	Atlanta	Delaware Valley
	2010 Model	1985 Models	1984 Trvl Sur	1985 Trvl Sur	1985 Trvl Sur	1980 Trvl Sur	1986 Trvl Sur
HBW	1.64	1.71	2.29	1.96	1.89	1.95	2.27
HBO	4.05	4.80	4.32	3.40	4.49	4.45	4.19
NHB	2.57	2.96	2.07	1.97	2.35	1.87	1.64
Total	8.75	9.47	8.68	7.33	8.73	8.27	8.10

Balancing Productions and Attractions

The last step in trip generation is the balancing of trip productions and attractions. Before balancing begins, productions and attractions should be compared to determine if the socioeconomic data is reasonable. The total ratio of productions to attractions is in the recommended range of –10 percent to +10 percent. The ratio of total production to attractions is 2.35 percent in the DMATS model as shown in Table 11.3.

Table 11.3 DMATS Comparison of Production and Attractions Before Balancing

Purpose	Productions	Attractions	Ratio	FHWA
HBW	48,002	48,491	1.02%	+/- 10%
HBSH	40,603	36,747	-9.50%	+/- 10%
HBSR	32,615	30,771	-5.65%	+/- 10%
HBO	38,689	37,324	-3.53%	+/- 10%
NHB	75,451	71,403	-5.37%	+/- 10%
CV	16,150	16,150	0.00%	+/- 10%
Total	235,360	240,886	2.35%	+/- 10%

Trip Distribution

Since the purpose of trip distribution is to link trip productions to trip attractions, validation includes evaluating trip lengths and intrazonal trips.

Trip Lengths

Trip lengths were evaluated by purpose and then compared to rates in other areas. As shown in Table 11.4 average trip lengths look reasonable when compared to other areas. Table 11.4 shows the average trip length for home-based work trips; home base other trips and non home base trips. The trip lengths are within the ranges established by FHWA.

Interzonal Trips

Intrazonal trips are trips the model assigns, which start and end in the same zone. Typically, intrazonal trips account for less than 5 percent of total trips. As shown in Table 11.5, the intrazonal trips assigned in the DMATS model only account for 3.84 percent of the total trips, which is within the percentages recommended by FHWA.

Table 11.4 Average Trip Length

Purpose	Time (Minutes)	Standards
HBW	11.71	11 - 15
HBO	11.14	9.5 - 13
NHB	10.48	9.5 – 12.5
CV	9.37	N/A
Quick Sum	10.87	11-15

Table 11.5 Interzonal Trip Percentages by Purpose

Purpose	% of Internal Trips	Standards FHWA
HBW	2.45%	5.00%
HBSH	3.38%	5.00%
HBSR	3.38%	5.00%
HBO	6.37%	5.00%
NHB	3.45%	5.00%
Total	3.84%	5.00%

Trip Assignment

The assignment of trips to the network is the final output of the modeling process. Validation of trip assignment includes reviewing like volumes and vehicle miles traveled from different grouping methods. The model review for DMATS included grouping information by functional class, linking AADT, and screenlines.

Table 11.6 shows the deviation of volumes by functional class. Deviation target rates are compared to rates from FHWA, Calibration and Adjustment of System Planning Models. The DMATS model currently meets rates for principal, minor arterials and major collectors, but is above the recommended value for local streets due to the few number of traffic counts available for comparison. However, as the overall counts are within the range established by FHWA it can be justified that if there are more counts on major collectors the percentages will be within the percentages recommended by FHWA.

Table 11.6 DMATS Volume Deviation by Function Classification 2010

Function Class	No of Counts	Count	Loaded	% Differnce	FHWA
7000+	129	1,417,700	1,410,054	-0.54%	+/- 10%
5000-7000	57	348,000	344,100	1.12%	+/- 15%
3000-5000	66	225,900	236,365	-4.63%	+/- 25%
1000-3000	67	97,165	106,598	-9.71%	+/- 50%
Total	0	2,203,885	2,235,408	-1.43%	

Vehicle miles traveled was also calculated by functional class as shown in Table 11.7 These values are within the ranges established by FHWA as shown in the table.

Table 11.7 Volume Deviation By Function Classification

Function Class	No of Counts	VMT Count	VMT Loaded	% Difference
Principal Arterial	122	418,134	460,470	10.12%
Major Arterial	110	98,790	92,190	6.68%
Minor Arterial	65	79,848	105,199	-31.75%
Collector & Local	24	21,163	22,780	7.64%
Total	321	617,934	680,639	-10.15%

When the Root Mean Square Error (RMSE) for these volumes is calculated, values are within in the ranges established by FHWA as shown in the Table 11.8.

Table 11.8 Root Mean Square Error (RMSE) by Function Class

Function Class	# of Counts	RMSE%	FHWA
Principal Arterial	122	15.81%	0-30%
Major Arterial	110	27.44%	0-30%
Minor Arterial	65	52.63%	0-30%
Collector & Local	24	60.33%	0-30%
Total	321	25.66%	0-30%

Average Annual Daily Traffic

Table 11.9 shows the deviation of volumes by AADT. All volume groups are in range when compared to target rates given by the FHWA as shown in the table. Deviations of vehicle miles traveled are also in range when compared by vehicle miles traveled as shown on Table 11.10.

Table 11.9 DMATS Volume Deviation by Aveage Annual Daily Traffic (AADT) 2010

Link AADT	No of Counts	Count	Loaded	% Differnce	FHWA
7000+	129	1,417,700	1,410,054	-0.54%	+/- 10%
5000-7000	57	348,000	344,100	1.12%	+/- 15%
3000-5000	66	225,900	236,365	-4.63%	+/- 25%
1000-3000	67	97,165	106,598	-9.71%	+/- 50%
Total	0	2,203,885	2,235,408	-1.43%	

Table 11.10 DMATS Vehicle Miles Traveled (VMT) Deviation By AADT 2010

Link AADT	No of Counts	VMT Count	VMT Loaded	% Difference
7000+	129	362,727	382,919	5.57%
5000-7000	57	100,434	107,560	-7.10%
3000-5000	66	62,918	70,011	-11.27%
1000-3000	67	48,953	59,594	-21.74%
Total	0	617,934	680,639	-10.15%

Screen Lines

Deviation comparisons were also compared across eight screenlines shown . Screenlines are selected at these locations because of there vital role in moving traffic in the study area and there diversity in function class. Table 11.11 shows the comparison of the actual traffic volumes to the volumes in the model.

Table 11.12 compares the total vehicle miles traveled for screenlines and for the actual base year. Overall it proves that the model is well calibrated and is representing the existing traffic conditions in the study area.

Table 11.11 Deviation of Screenline Volume

Screenline	Base Year Volume	Assigned Volume	Percent Deviation (Deviation/Count)	Model/Count
1	45,400	45,656	1.60%	0.98
2	28,510	29,990	5.19%	1.05
3	55,400	48,304	12.81%	0.87
4	100,300	100,918	0.62%	1.01
5	43,950	42,190	4.00%	0.96
6	44,500	44,312	0.42%	1.00
7	68,900	63,011	8.55%	0.91
8	54,100	61,143	13.02%	1.13

Table 11.12 Screenline Vehicle Miles Traveled

Screenline	Base Year VMT	Assigned VMT	VMT Model/ Count
1	22220	21473	0.97
2	10542	11207	1.06
3	18036	17484	0.97
4	18354	16245	0.89
5	33687	34589	1.03
6	19219	18808	0.98
7	16329	14110	0.86
8	19836.7	22811	1.15

Model Running Results

Relative Gap	0.00181813313
RMSE	15.7742804
% RMSE	0.574853803
Max Flow Change	154.579458
Equilibrium reached	Yes
Total VHT	53504.50
Total VMT	1846789.55
Centroid VHT	11547.77
Centroid VMT	248284.67
VHT w/o Centroids	41956.73
VMT w/o Centroids	1598504.89
Feedback Iteration	1
Feedback RMSE	4175.06
Feedback Max Flow Change	21195.75

Model Code

Dbox “ECIA2010”

```
  // specify what needs to be done when you intialize the dbox
  init do
     path = null
  endItem

  // Now define the buttons and what needs to be done when you press the button
  // Button 1: Just a text box
  text   20, 1.5, 1  prompt: “Specify Model Folder:”

  // Button 2: Button to choose the directory
  button After, Same icons: “bmp\\plansetup.bmp”, “bmp\\plansetup.bmp”  do

    // Some error trapping here
    on escape goto skip
    on error goto skip
    path = ChooseDirectory(“Choose Model Folder”,)
    path = path + “\\”

    skip:
     on escape default
     on error default
  enditem

  // Button 3: OK
  Button “Run” 4, 5, 10 prompt: “Run Model”
  do
     if path = null then do
        ShowMessage(“Please choose the model path first.”)
        goto skip1
     end
     RunMacro(“Model”, path)

    skip1:
  enditem

  // Button 4: Open Map
  Button “Open” 4, 7, 10 prompt: “Open Map”
  do
          if path = null then do
        ShowMessage(“Please choose the model path first.”)
        goto skip1
     end
          RunMacro(“Open Map”, path)

          skip1:
  enditem

  // Button 5: Cancel
  Button “Cancel” 20, 5, 10 prompt: “Cancel”
  do
     Return()
  enditem

endDBox

Macro “Model” (path)
```

```
   RunMacro("TCB Init")
// STEP 1: Fill Dataview
    Opts = null
    Opts.Input.[Dataview Set] = {path + "2010 network 122909.DBD|NETWORK", "NETWORK"}
    Opts.Global.Fields = {"[TRAVEL TIME]"}
    Opts.Global.Method = "Formula"
    Opts.Global.Parameter = "Length*60/ [SPEED LIMIT]"
    ret_value = RunMacro("TCB Run Operation", "Fill Dataview", Opts, &Ret)
    if !ret_value then goto quit

// STEP 2: Build Highway Network
    Opts = null
    Opts.Input.[Link Set] = {path + "2010 network 122909.DBD|NETWORK", "NETWORK"}
    Opts.Global.[Network Options].[Node ID] = "Endpoints.ID"
    Opts.Global.[Network Options].[Link ID] = "NETWORK.ID"
    Opts.Global.[Network Options].[Turn Penalties] = "Yes"
    Opts.Global.[Network Options].[Keep Duplicate Links] = "FALSE"
    Opts.Global.[Network Options].[Ignore Link Direction] = "FALSE"
    Opts.Global.[Network Options].[Time Unit] = "Minutes"
     Opts.Global.[Link Options] = {{"Length", {"NETWORK.Length", "NETWORK.Length", , , "False"}}, {"[AB Capacity]", {"NET-
WORK.[AB Capacity]", "NETWORK.[AB Capacity]", , , "False"}}, {"[SPEED LIMIT]", {"NETWORK.[SPEED LIMIT]", "NETWORK.
[SPEED LIMIT]", , , "False"}}, {"[TRAVEL TIME]", {"NETWORK.[TRAVEL TIME]", "NETWORK.[TRAVEL TIME]", , , "False"}}}
    Opts.Global.[Length Unit] = "Miles"
    Opts.Global.[Time Unit] = "Minutes"
    Opts.Output.[Network File] = path + "2010 network 07012010.net"
    ret_value = RunMacro("TCB Run Operation", "Build Highway Network", Opts, &Ret)
    if !ret_value then goto quit

// STEP 3: Highway Network Setting
    Opts = null
    Opts.Input.Database = path + "2010 network 122909.DBD"
    Opts.Input.Network = path + "2010 network 07012010.net"
   Opts.Input.[Centroids Set] = {path + "2010 network 122909.DBD|Endpoints", "Endpoints", "Selection", "Select * where [centroid
no]>0"}
    Opts.Input.[Spc Turn Pen Table] = {path + "ECIA Turn Penality 2010 011109.bin"}
    Opts.Global.[Global Turn Penalties] = {0, 0, 0, -1}
    ret_value = RunMacro("TCB Run Operation", "Highway Network Setting", Opts, &Ret)
    if !ret_value then goto quit

// STEP 4: Balance
    Opts = null
    Opts.Input.[Data View Set] = {path + "Unbalanced trips 2010.bin", "Unbalanced trips 2010"}
    Opts.Field.[Vector 1] = {"HBWP", "HBOA", "NHBP", "HBSHP", "HBSRP", "CVP"}
    Opts.Field.[Vector 2] = {"HBWA", "HBOP", "NHBA", "HBSHA", "HBSRA", "CVA"}
    Opts.Global.[Store Type] = "Real"
    Opts.Output.[Output Table] = path + "ECIA Balanced Trips 2010 070110.BIN"
    ret_value = RunMacro("TCB Run Procedure", "Balance", Opts, &Ret)
    if !ret_value then goto quit

// STEP 5: TCSPMAT
     Shared feedback_iteration

     for feedback_iteration = 1 to 10 do     // maximum of 10 feedback iterations
            if feedback_iteration = 1 then do     // if going through the first iteration
          SkimField =  "[TRAVEL TIME]"    // use free-flow travel time
          CoreLabel =  "Shortest Path - [TRAVEL TIME]"
            end
     else do      // if subsequent feedback iteration
          SkimField =  "__MSATime"       // use MSA-generated travel time
          CoreLabel =  "Shortest Path - __MSATime"
```

```
    end

    Opts = null
    Opts.Input.Network = path + "2010 NETWORK 07012010.NET"
     Opts.Input.[Origin Set] = {path + "2010 network 122909.DBD|Endpoints", "Endpoints", "Selection", "Select * where [centroid no]>0"}
    Opts.Input.[Destination Set] = {path + "2010 network 122909.DBD|Endpoints", "Endpoints", "Selection"}
    Opts.Input.[Via Set] = {path + "2010 network 122909.DBD|Endpoints", "Endpoints"}
    Opts.Field.Minimize = SkimField
    Opts.Field.Nodes = "Endpoints.ID"
    Opts.Output.[Output Matrix].Label = "Shortest Path"
    Opts.Output.[Output Matrix].[File Name] = path + "ECIA Shortest Path 070110#^.MTX"
    ret_value = RunMacro("TCB Run Procedure", "TCSPMAT", Opts, &Ret)
    if !ret_value then goto quit

// STEP 6: Intrazonal
    Opts = null
     //Opts.Input.[Matrix Currency] = {path + "ECIA Shortest Path 070110#^.mtx", "Shortest Path - [TRAVEL TIME]", "Origin", "Destination"}
    Opts.Input.[Matrix Currency] = {path + "ECIA Shortest Path 070110#^.mtx", , "Origin", "Destination"}
    Opts.Global.Factor = 1
    Opts.Global.Neighbors = 3
    Opts.Global.Operation = 1
    Opts.Global.[Treat Missing] = 1
    ret_value = RunMacro("TCB Run Procedure", "Intrazonal", Opts, &Ret)
    if !ret_value then goto quit

// STEP 7: Gravity
    Opts = null
    Opts.Input.[PA View Set] = {path + "ECIA Balanced Trips 2010 070110.BIN", "ECIA Balanced Trips 2010 070110"}
    Opts.Input.[FF Matrix Currencies] = {, , , , , }
     Opts.Input.[Imp Matrix Currencies] = {{path + "ECIA Shortest Path 070110#^.mtx", , "Origin", "Destination"}, {path + "ECIA Shortest Path 070110#^.mtx", , "Origin", "Destination"}, {path + "ECIA Shortest Path 070110#^.mtx", , "Origin", "Destination"}, {path + "ECIA Shortest Path 070110#^.mtx", , "Origin", "Destination"}, {path + "ECIA Shortest Path 070110#^.mtx", , "Origin", "Destination"}, {path + "ECIA Shortest Path 070110#^.mtx", , "Origin", "Destination"}}
    Opts.Input.[KF Matrix Currencies] = {, , , , , }
    Opts.Field.[Prod Fields] = {"[ECIA Balanced Trips 2010 070110].HBWP", "[ECIA Balanced Trips 2010 070110].HBOP", "[ECIA Balanced Trips 2010 070110].NHBP", "[ECIA Balanced Trips 2010 070110].HBSHP", "[ECIA Balanced Trips 2010 070110].HBSRP", "[ECIA Balanced Trips 2010 070110].CVP"}
    Opts.Field.[Attr Fields] = {"[ECIA Balanced Trips 2010 070110].HBWA", "[ECIA Balanced Trips 2010 070110].HBOA", "[ECIA Balanced Trips 2010 070110].NHBA", "[ECIA Balanced Trips 2010 070110].HBSHA", "[ECIA Balanced Trips 2010 070110].HB-SRA", "[ECIA Balanced Trips 2010 070110].CVA"}
    Opts.Global.[Purpose Names] = {"HBW", "HBO", "NHB", "HBSH", "HBSR", "CV"}
    Opts.Global.Iterations = {10, 10, 10, 10, 10, 10}
    Opts.Global.Convergence = {0.01, 0.01, 0.01, 0.01, 0.01, 0.01}
    Opts.Global.[Constraint Type] = {"Double", "Double", "Double", "Double", "Double", "Double"}
    Opts.Global.[Fric Factor Type] = {"Gamma", "Gamma", "Gamma", "Gamma", "Gamma", "Gamma"}
    Opts.Global.[A List] = {28507, 28507, 28507, 28507, 28507, 28507}
    Opts.Global.[B List] = {0.02, 0.02, 0.02, 0.02, 0.02, 0.02}
    Opts.Global.[C List] = {0.123, 0.123, 0.123, 0.123, 0.123, 0.123}
    Opts.Flag.[Use K Factors] = {0, 0, 0, 0, 0, 0}
    Opts.Output.[Output Matrix].Label = "Gravity Matrix"
    Opts.Output.[Output Matrix].Type = "Float"
    Opts.Output.[Output Matrix].[File based] = "FALSE"
    Opts.Output.[Output Matrix].Sparse = "False"
    Opts.Output.[Output Matrix].[Column Major] = "False"
    Opts.Output.[Output Matrix].Compression = 0
    Opts.Output.[Output Matrix].[File Name] = path + "ECIA Gravity 070110.mtx"
    ret_value = RunMacro("TCB Run Procedure", "Gravity", Opts, &Ret)
    if !ret_value then goto quit
```

```
// STEP 8: Matrix QuickSum
    Opts = null
    Opts.Input.[Input Currency] = {path + "ECIA Gravity 070110.mtx", "HBW", "Row ID's", "Col ID's"}
    ret_value = RunMacro("TCB Run Operation", "Matrix QuickSum", Opts, &Ret)
    if !ret_value then goto quit

// STEP 9: PA2OD
    Opts = null
    Opts.Input.[PA Matrix Currency] = {path + "ECIA Gravity 070110.mtx", "QuickSum", "Row ID's", "Col ID's"}
    Opts.Field.[Matrix Cores] = {7}
    Opts.Field.[Adjust Fields] = {}
    Opts.Field.[Peak Hour Field] = {}
    Opts.Global.[Method Type] = "PA to OD"
    Opts.Global.[Start Hour] = 0
    Opts.Global.[End Hour] = 23
    Opts.Global.[Cache Size] = 500000
    Opts.Global.[Average Occupancies] = {1.5}
    Opts.Global.[Adjust Occupancies] = {"No"}
    Opts.Global.[Peak Hour Factor] = {1}
    Opts.Flag.[Separate Matrices] = "No"
    Opts.Flag.[Convert to Vehicles] = {"No"}
    Opts.Flag.[Include PHF] = {"No"}
    Opts.Flag.[Adjust Peak Hour] = {"No"}
    Opts.Output.[Output Matrix].Label = "PA to OD"
    Opts.Output.[Output Matrix].[File Name] = path + "ECIA PA to OD 070110.MTX"
    ret_value = RunMacro("TCB Run Procedure", "PA2OD", Opts, &Ret)
    if !ret_value then goto quit

// STEP 10: Combine Matrix Files
    Opts = null
    Opts.Input.[Matrix Currencies] = {{path + "ECIA ext-ext 2005- 2010 121106.mtx", "Field 3", "Field 1", "Field 2"}, {path + "ECIA
ext-ext 2005- 2010 121106.mtx", "QuickSum", "Field 1", "Field 2"}, {path + "ECIA PA to OD 070110.mtx", "QuickSum (0-24)",
"Rows", "Cols"}}
    Opts.Global.Operation = "Union"
    Opts.Output.[Combined Matrix].Label = "Union Combine"
    Opts.Output.[Combined Matrix].Type = "Float"
    Opts.Output.[Combined Matrix].[File based] = "True"
    Opts.Output.[Combined Matrix].Sparse = "False"
    Opts.Output.[Combined Matrix].[Column Major] = "False"
    Opts.Output.[Combined Matrix].Compression = 0
    Opts.Output.[Combined Matrix].[File Name] = path + "Matrix1.mtx"
    Opts.Output.[Combined Matrix].Tables = {"Field 3", "QuickSum"}
    ret_value = RunMacro("TCB Run Operation", "Combine Matrix Files", Opts, &Ret)
    if !ret_value then goto quit

// STEP 11: Matrix QuickSum
    Opts = null
    Opts.Input.[Input Currency] = {path + "Matrix1.mtx", "Field 3", "Rows", "Columns"}
    ret_value = RunMacro("TCB Run Operation", "Matrix QuickSum", Opts, &Ret)
    if !ret_value then goto quit

// STEP 12: Highway Network Setting
    Opts = null
    Opts.Input.Database = path + "2010 network 122909.DBD"
    Opts.Input.Network = path + "2010 network 07012010.net"
    Opts.Input.[Spc Turn Pen Table] = {path + "ECIA TURN PENALITY 2010 011109.BIN"}
    Opts.Global.[Global Turn Penalties] = {0, 0, 0, -1}
    Opts.Flag.[Centroids in Network] = 1
```

```
    ret_value = RunMacro("TCB Run Operation", "Highway Network Setting", Opts, &Ret)

    if !ret_value then goto quit

// STEP 13: Assignment
    Opts = null
    Opts.Input.Database = path + "2010 network 122909.DBD"
    Opts.Input.Network = path + "2010 network 07012010.net"
    Opts.Input.[OD Matrix Currency] = {path + "Matrix1.mtx", "QuickSum", "Rows", "Columns"}
          Opts.Input.[Turning Movement Node Set] = {path + "2010 network 122909.DBD|Endpoints", "Endpoints"}
    Opts.Field.[VDF Fld Names] = {"[TRAVEL TIME]", "[AB Capacity]", "None", "None", "None"}
    Opts.Global.[Load Method] = "SUE"
    Opts.Global.[Loading Multiplier] = 1
    Opts.Global.[Alpha Value] = 0.15
    Opts.Global.[Beta Value] = 4
          Opts.Field.[MSA Flow] = "__MSAFlow"
    Opts.Field.[MSA Cost] = "__MSATime"
    Opts.Global.Convergence = 0.002
    Opts.Global.Iterations = 100
    Opts.Global.[Proportional Iterations] = 0
    Opts.Global.[Stoch Error] = 5
    Opts.Global.[Stoch Function] = 1
    //Opts.Global.[Critical Query File] = path + "ECIA.qry"     //Additional line of code used to define select links included in the
model run.
   Opts.Global.[Movement Set Name] = "All Features"                    //Required line of code to create a turning movement file.
    Opts.Global.[Cost Function File] = "bpr.vdf"
    Opts.Global.[VDF Defaults] = {, , 0.15, 4, 0}
          Opts.Flag.[Do Turn Movement] = 1
         Opts.Global.[MSA Iteration] = feedback_iteration
    Opts.Output.[Flow Table] = path + "ECIA ASN_LinkFlow 2010 070110#^.BIN"
         Opts.Output.[Movement Table] = path + "ECIA ASN_Movement 2010 070110#^.bin"
    ret_value = RunMacro("TCB Run Procedure", "Assignment", Opts, &Ret)
    if !ret_value then goto quit
          rmse = Ret[2].[MSA RMSE]

//    Check Convergence
     if feedback_iteration > 1 then do
        if rmse < 20 then goto quit       // If rmse is below convergence criteria then exit loop
      end
     end    // for iteration
     feedback_iteration = null


// STEP 14: Fill Dataview
    Opts = null
     Opts.Input.[Dataview Set] = {{path + "2010 network 122909.dbd|NETWORK", path + "ECIA ASN_LinkFlow 2010 070110#^.
BIN", {"ID"}, {"ID1"}}, "NETWORK+ECIA ASN_LinkFlow 2010 "}
    Opts.Global.Fields = {"Totalflow"}
    Opts.Global.Method = "Formula"
    Opts.Global.Parameter = "Tot_Flow"

   ret_value = RunMacro("TCB Run Operation", "Fill Dataview", Opts, &Ret)

    if !ret_value then goto quit
          quit:
       Return( RunMacro("TCB Closing", ret_value, True ) )
endMacro
```

Socioeconomic Data 2010

T A Z 2010	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
1	44	25	15	10	25	0
2	63	30	0	15	15	0
3	252	125	4	46	50	24
4	210	75	15	30	45	29
5	148	60	4	56	60	8
6	175	55	0	40	40	25
7	205	75	20	80	100	28
8	145	55	10	10	20	4
9	99	65	4	31	35	0
10	59	25	4	0	4	0
11	48	25	0	10	10	0
12	379	140	4	61	65	34
13	30	10	15	20	35	14
14	246	114	25	45	70	35
15	1374	559	35	360	395	243
16	880	307	15	90	105	14
17	883	450	4	156	160	105
18	547	283	101	689	789	200
19	1808	860	55	980	1035	855
20	168	86	10	2415	2425	89
21	395	180	4	51	55	0
22	119	41	10	0	10	0
23	786	308	0	34	34	34
24	520	269	11	11	21	4
25	80	50	46	274	319	151
26	48	610	190	230	420	139
27	438	460	0	71	71	19
28	69	15	123	1044	1167	1034
29	756	323	0	130	130	84
30	547	224	0	30	30	4
31	490	244	25	40	65	29
32	106	65	10	5	15	4
33	245	70	20	20	40	0
34	399	143	30	35	65	12
35	935	445	15	90	105	55
36	0	0	0	395	395	365
37	2942	1470	70	790	860	655
38	938	645	0	145	145	114
39	92	20	780	990	1770	765
40	750	230	32	85	118	41
41	673	210	1842	1267	3109	1094
42	1623	820	0	119	119	76
43	400	141	151	177	328	133
44	1029	373	75	317	392	187
45	4979	1377	285	728	1013	494
46	127	4	131	1224	1354	350

Socioeconomic Data 2010 Continued.

T A Z 2010	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
47	1087	667	124	626	750	507
48	13	90	0	29	29	29
49	31	10	194	119	313	60
50	347	173	148	243	391	47
51	10	4	515	405	920	314
52	-5	0	0	15	15	4
53	386	10	663	70	733	41
54	675	346	248	362	610	279
55	845	308	11	122	132	45
56	343	186	5	46	51	21
57	89	30	0	4	4	4
58	82	29	0	25	25	0
59	334	163	4	11	15	10
60	928	50	0	11	11	9
61	1239	475	0	4	4	4
62	1539	590	21	64	86	26
63	211	42	0	32	32	36
64	739	248	45	479	524	241
65	316	100	185	846	1032	206
66	199	55	0	91	91	11
67	127	47	0	10	10	0
68	331	122	0	10	10	4
69	753	127	44	117	161	82
70	190	85	8	154	162	23
71	23	4	39	1470	1508	218
72	676	200	0	4	4	4
73	833	288	13	149	162	128
74	1083	404	0	20	20	0
75	1747	682	0	60	60	50
76	913	285	0	0	0	0
77	163	50	10	110	120	18
78	655	230	41	171	212	16
79	18	6	0	0	0	0
80	3289	1230	30	1570	1600	1425
81	231	87	0	0	0	0
82	1880	675	40	560	600	440
83	0	0	30	1430	1461	814
84	747	355	0	330	330	219
85	210	274	48	399	447	206
86	1469	571	0	330	330	293
87	211	78	4	21	25	0
88	0	40	527	642	1169	451
89	609	185	0	40	40	4
90	49	22	0	20	20	4
91	29	11	0	175	175	10
92	139	76	0	20	20	10

Socioeconomic Data 2010 Continued.

T A Z 2010	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
93	42	20	0	0	0	0
94	32	5	0	12	12	0
95	52	17	0	35	35	34
96	90	35	0	10	10	8
97	298	141	11	34	46	16
98	1891	825	10	105	115	30
99	17	4	35	620	655	15
100	2388	854	20	810	830	700
101	1747	855	4	161	165	119
102	712	360	10	735	745	60
103	1455	615	15	220	235	99
104	0	0	0	30	30	0
105	0	0	10	10	20	0
106	2645	1200	0	410	410	310
107	2947	1330	35	175	210	105
108	3307	1100	85	1340	1425	1225
109	591	292	1	24	25	5
110	942	334	80	164	244	126
111	0	0	31	1515	1546	72
112	425	151	75	156	231	119
113	629	303	29	936	965	205
114	2274	1030	15	875	890	825
115	65	22	108	549	657	209
116	634	218	56	284	340	108
117	0	0	46	232	278	88
118	295	90	0	15	15	0
119	40	11	0	15	15	0
120	10	6	0	0	0	0
121	52	31	4	38	42	15
122	0	0	20	431	451	136
123	165	130	130	2819	2949	889
124	158	87	20	76	96	62
125	188	104	124	484	608	391
126	318	192	10	104	114	88
127	143	86	25	276	301	231
128	331	197	145	1263	1408	487
129	58	35	6	49	55	19
130	343	154	7	59	66	23
131	79	36	13	106	119	42
132	286	140	117	666	783	32
133	51	25	3	15	18	1
134	1165	476	37	2224	2261	2176
135	1586	686	19	247	266	171
136	541	234	6	83	89	58

Socioeconomic Data 2040

T A Z 2040	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
1	45	25	17	11	28	0
2	63	30	0	17	17	0
3	254	125	4	51	55	26
4	212	75	17	33	50	32
5	149	60	4	62	66	9
6	176	55	0	44	44	28
7	207	75	22	88	110	31
8	146	55	11	11	22	4
9	99	65	4	34	38	0
10	59	25	4	0	4	0
11	48	25	0	11	11	0
12	382	140	4	67	71	38
13	31	10	1	22	23	15
14	248	114	28	50	78	39
15	1384	559	39	397	436	268
16	887	307	17	99	116	15
17	890	450	4	172	176	116
18	551	283	111	760	871	220
19	1822	860	61	1081	1142	943
20	203	103	11	2665	2676	98
21	452	206	4	56	60	0
22	136	46	11	0	11	0
23	2970	1159	0	56	56	56
24	574	296	14	14	28	5
25	81	50	54	325	379	179
26	57	719	218	264	482	160
27	441	460	0	83	83	23
28	70	15	213	1807	2020	1789
29	1202	514	0	156	156	101
30	807	329	0	33	33	4
31	581	289	28	44	72	32
32	106	65	11	6	17	4
33	452	129	22	22	44	0
34	466	166	33	39	72	13
35	942	445	17	99	116	61
36	0	0	0	436	436	402
37	2964	1470	81	919	1000	762
38	1054	693	0	160	160	126
39	93	20	878	1114	1992	861
40	1632	576	48	128	176	61
41	1361	420	2209	1519	3728	1312
42	2066	905	0	132	132	84
43	415	145	249	293	542	220
44	1037	373	83	350	433	206
45	5635	1502	342	873	1215	592

Socioeconomic Data 2040 Continued.

T A Z 2040	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
46	630	220	144	1350	1494	387
47	1238	731	187	737	924	599
48	13	90	0	32	32	32
49	32	10	214	131	345	66
50	352	174	163	268	431	5
51	10	4	589	463	1052	59
52	0	0	0	17	17	4
53	387	10	1002	106	1108	62
54	684	349	274	399	673	308
55	1347	489	13	155	168	58
56	365	196	6	62	68	29
57	90	30	0	4	4	4
58	132	46	0	28	28	0
59	383	185	4	12	16	11
60	1436	76	0	14	14	11
61	1709	650	0	4	4	4
62	2210	841	28	85	113	34
63	590	116	0	42	42	48
64	1143	382	60	638	698	322
65	571	203	331	1511	1842	369
66	339	115	0	100	100	12
67	146	53	0	11	11	0
68	1129	413	0	11	11	4
69	1071	180	178	476	654	333
70	191	85	11	225	236	33
71	24	4	69	2641	2710	391
72	947	279	0	4	4	4
73	845	289	19	222	241	191
74	4092	1522	0	22	22	0
75	3721	1444	0	66	66	55
76	1292	400	0	0	0	0
77	165	50	11	121	132	20
78	1898	412	145	613	758	58
79	17	6	0	0	0	0
80	3314	1230	34	1774	1808	1610
81	244	91	0	0	0	0
82	1950	695	47	651	698	512
83	0	120	34	2239	2273	899
84	753	355	0	364	364	242
85	213	276	53	440	493	227
86	1537	593	0	389	389	346
87	287	105	4	23	27	0
88	0	40	598	729	1327	512
89	1380	418	0	44	44	4
90	56	25	0	22	22	4
91	34	12	0	193	193	11

Socioeconomic Data 2040 Continued.

T A Z 2040	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
92	149	81	0	22	22	11
93	43	20	0	0	0	0
94	44	6	0	18	18	0
95	52	17	0	59	59	56
96	91	35	0	11	11	9
97	305	144	16	47	63	22
98	2512	1092	11	116	127	33
99	16	4	40	707	747	17
100	2735	973	23	944	967	815
101	1760	855	4	178	182	131
102	1118	560	11	813	824	66
103	1466	615	17	243	260	109
104	0	0	0	33	33	0
105	0	0	11	11	22	0
106	2666	1200	0	452	452	342
107	3011	1350	39	193	232	116
108	3333	1100	98	1546	1644	1413
109	596	292	1	26	27	6
110	949	334	88	181	269	139
111	0	0	38	1868	1906	85
112	428	151	83	172	255	131
113	634	303	32	1033	1065	226
114	2291	1030	17	965	982	910
115	319	164	119	795	914	231
116	638	218	62	313	375	119
117	380	190	165	838	1003	317
118	4067	1460	0	15	15	0
119	2932	1068	155	110	265	48
120	10	6	0	0	0	0
121	52	31	4	42	46	17
122	0	0	22	476	498	150
123	367	230	407	8846	9253	2789
124	159	87	22	84	106	68
125	328	174	150	585	735	473
126	320	192	11	115	126	97
127	144	86	28	305	333	255
128	336	198	160	1394	1554	537
129	58	35	7	54	61	21
130	426	194	8	65	73	25
131	80	36	14	117	131	46
132	1628	810	321	1826	2147	88
133	51	25	3	17	20	1
134	1707	742	41	2454	2495	2401
135	1598	686	21	273	294	189
136	545	234	7	92	99	64
137	0	0	66	1616	1682	

DMATS Trip Table 2010

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	HBShopP	HBShopA	HBSRP	HBSRA	CVP	CVA
1	40	23	30	19	54	35	31	23	27	18	13	13
2	50	14	39	24	81	35	42	24	31	22	11	11
3	177	45	133	94	259	131	148	95	122	87	47	47
4	120	41	101	57	189	112	98	61	85	53	32	32
5	92	55	75	57	133	101	73	55	64	49	24	24
6	92	36	82	48	145	95	74	47	63	42	21	21
7	131	91	102	75	188	152	102	76	87	63	35	35
8	88	18	67	38	116	69	68	41	61	36	23	23
9	114	32	90	51	149	63	84	52	75	47	25	25
10	37	4	23	15	49	25	31	17	23	15	10	10
11	37	9	31	19	50	25	28	19	24	18	9	9
12	230	59	184	108	327	189	179	109	149	99	53	53
13	23	32	22	13	29	38	15	16	14	10	8	8
14	227	64	196	86	306	144	167	93	143	80	49	49
15	855	359	678	474	1324	809	715	471	574	420	221	221
16	502	95	378	222	684	405	381	229	336	208	117	117
17	565	145	447	334	872	448	480	337	396	310	167	167
18	358	717	296	420	710	805	349	393	258	320	151	151
19	1155	941	971	880	2226	1458	1089	836	808	737	355	355
20	129	2204	82	913	177	1915	106	694	84	563	115	115
21	259	50	193	130	385	188	220	133	182	122	67	67
22	74	9	59	25	103	51	57	29	51	25	17	17
23	548	31	427	202	644	316	388	211	331	197	111	111
24	359	19	280	170	616	208	326	182	254	168	99	99
25	76	290	62	128	107	273	63	117	51	89	39	39
26	804	382	634	459	1337	339	742	511	554	424	276	276
27	839	64	718	309	1110	215	586	320	546	298	167	167
28	31	1061	27	381	41	917	23	317	21	230	73	73
29	522	119	406	246	736	379	414	246	345	226	120	120
30	421	27	312	149	568	225	314	155	256	144	81	81
31	378	59	321	165	593	230	301	177	259	159	95	95
32	100	14	86	42	159	51	79	47	69	41	26	26
33	125	36	100	50	161	121	88	56	79	47	31	31
34	254	59	219	101	354	197	188	111	169	95	60	60
35	585	95	432	307	889	425	518	320	401	293	166	166
36	0	359	0	141	0	302	0	104	0	83	13	13
37	1695	782	1279	1190	2763	1743	1573	1191	1170	1072	570	570
38	842	132	639	450	1334	457	736	461	594	428	235	235
39	41	1609	31	365	48	1386	30	479	24	221	246	246
40	368	107	302	172	582	366	299	182	248	160	93	93
41	277	2826	1034	6365	2459	4622	563	3018	200	397	1081	1081
42	3771	109	1013	549	2864	2344	7247	1098	825	530	583	624
43	282	298	243	150	356	398	195	179	180	124	96	96
44	603	356	526	343	910	679	475	348	411	297	164	164

DMATS Trip Table 2010 Continued.

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	HBShopP	HBShopA	HBSRP	HBSRA	CVP	CVA
45	1993	921	1610	1110	3007	2611	1636	1170	1347	1002	591	591
46	9	1231	4	438	7	1082	5	359	4	261	77	77
47	851	682	715	635	1501	974	773	635	602	543	292	292
48	99	26	69	66	182	27	101	67	74	62	33	33
49	14	284	8	48	21	250	12	89	10	31	59	59
50	203	355	151	194	395	427	210	216	145	158	109	109
51	16	2690	10	473	23	2275	19	788	10	283	486	486
52	0	14	0	5	0	10	0	4	0	3	1	1
53	11	667	6	31	19	703	11	199	8	21	180	180
54	506	555	409	343	752	715	407	388	341	290	201	201
55	571	120	475	233	744	413	410	237	369	215	117	117
56	309	46	289	131	502	165	231	135	211	124	69	69
57	13	4	8	20	22	36	15	21	9	19	11	11
58	0	23	0	27	0	50	0	25	0	23	11	11
59	269	14	206	104	358	135	208	111	175	103	60	60
60	93	10	82	34	122	351	65	35	61	33	18	18
61	448	4	377	295	629	460	334	313	300	293	170	170
62	919	78	776	388	1249	633	688	410	599	377	218	218
63	71	29	60	38	93	102	49	36	46	33	16	16
64	395	476	315	324	557	673	317	300	269	254	116	116
64.5	523	0	416	202	736	383	417	215	357	201	117	117
65	136	938	84	363	214	905	120	337	103	240	113	113
66	95	82	81	66	144	143	75	60	63	53	23	23
67	78	9	66	32	116	55	63	33	52	31	17	17
68	255	9	235	79	326	130	173	82	165	77	44	44
69	213	147	183	120	302	401	166	126	148	103	61	61
70	142	147	102	107	186	194	109	98	89	85	38	38
71	7	1371	6	526	9	1161	4	399	4	313	62	62
72	329	4	308	125	504	252	245	132	224	124	72	72
73	470	147	408	231	689	431	367	231	315	209	111	111
74	672	18	523	257	914	415	511	270	443	253	145	145
75	1186	55	898	443	1596	690	881	463	795	433	246	246
76	451	0	344	176	600	337	326	187	287	175	102	102
77	87	109	88	70	164	152	72	64	61	54	24	24
78	330	192	261	203	540	403	288	207	230	178	99	99
79	0	0	0	4	0	6	0	4	0	4	2	2
80	1620	1454	1312	1319	2635	2436	1395	1228	1094	1089	500	500
81	173	0	136	54	206	85	117	57	104	53	31	31
82	979	545	760	616	1516	1152	858	601	658	534	270	270
83	0	1328	0	509	0	1116	0	384	0	302	57	57
84	306	300	276	337	675	528	310	320	222	288	138	138
85	405	406	319	311	585	419	336	297	268	253	124	124
86	836	300	667	470	1244	794	703	461	561	421	215	215
87	142	23	111	55	177	97	100	57	90	52	29	29
88	66	1062	48	253	87	893	51	334	42	160	175	175

DMATS Trip Table 2010 Continued.

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	HBShopP	HBShopA	HBSRP	HBSRA	CVP	CVA
89	333	36	294	129	546	255	259	132	221	122	67	67
90	45	18	41	21	59	33	33	20	30	18	9	9
91	20	159	20	69	26	144	12	53	13	43	10	10
92	109	18	73	54	165	67	91	55	80	51	28	28
93	38	0	33	12	66	16	29	13	24	12	7	7
94	9	11	9	7	11	21	5	6	6	5	2	2
95	28	32	23	23	40	46	23	20	21	18	7	7
96	63	9	52	25	81	41	45	26	40	24	13	13
97	194	42	149	100	297	145	160	105	132	94	55	55
98	1225	105	976	547	1872	785	1036	572	820	530	301	301
99	7	595	7	223	10	507	5	175	5	133	32	32
100	953	754	730	816	1619	1515	897	779	661	697	338	338
101	1091	150	880	586	1820	771	980	604	756	561	312	312
102	414	677	321	484	757	832	413	432	291	377	156	156
103	767	214	640	458	1388	716	724	465	525	425	231	231
104	0	27	0	11	0	23	0	8	0	6	1	1
105	0	18	0	4	0	15	0	5	0	2	3	3
106	1734	373	1386	888	2619	1289	1427	895	1178	826	442	442
107	1816	191	1420	884	3060	1248	1632	928	1245	856	490	490
108	1320	1295	1092	1157	2177	2309	1186	1096	910	960	461	461
109	379	23	304	189	623	237	332	198	266	185	105	105
110	430	222	380	265	784	534	384	283	301	240	146	146
111	0	1405	0	539	0	1181	0	407	0	320	60	60
112	194	210	172	149	354	333	174	160	135	126	79	79
113	392	877	314	520	646	969	345	453	276	384	148	148
114	1339	809	1081	948	2137	1519	1166	910	911	819	401	401
115	25	597	20	209	40	526	26	187	16	129	55	55
116	260	309	196	236	403	494	247	232	170	194	102	102
117	0	253	0	83	0	212	0	73	0	49	20	20
118	166	14	135	61	214	120	125	63	103	59	33	33
119	19	14	16	12	27	26	15	11	11	10	5	5
120	7	0	4	4	15	4	7	4	4	4	2	2
121	23	38	19	33	45	51	24	31	17	27	13	13
122	0	410	0	153	0	345	0	119	0	91	20	20
123	14	2681	13	1084	47	2314	19	861	13	675	176	176
124	55	87	39	81	108	131	63	82	40	70	39	39
125	66	552	47	236	130	534	75	228	47	166	86	86
126	148	104	120	156	367	204	177	156	112	140	75	75
127	66	274	53	151	164	283	80	136	50	111	47	47
128	120	1280	96	572	258	1198	126	500	87	388	152	152
129	23	50	18	39	48	63	24	37	16	32	16	16
130	147	60	113	116	288	177	155	118	105	107	59	59
131	33	108	25	60	66	120	35	55	26	45	20	20
132	146	712	122	324	249	704	133	298	101	227	103	103
133	25	16	22	21	44	32	24	21	18	19	10	10

DMATS Trip Table 2010 Continued.

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	HBShopP	HBShopA	HBSRP	HBSRA	CVP	CVA
134	476	2055	391	1086	888	2157	471	907	336	763	255	255
135	974	242	813	512	1655	788	853	520	674	475	258	258
136	332	81	276	174	564	268	292	177	230	162	88	88
137	0	1386	0	522	0	1165	0	401	0	309	66	66
138	1389	2083	3194	3749	2361	2361	0	0	0	0	0	0
139	209	313	480	563	354	354	0	0	0	0	0	0
140	456	684	1049	1231	775	775	0	0	0	0	0	0
141	714	1071	1642	1927	1214	1214	0	0	0	0	0	0
142	491	736	1129	1325	834	834	0	0	0	0	0	0
143	934	1400	2147	2521	1587	1587	0	0	0	0	0	0
144	10	15	23	27	17	17	0	0	0	0	0	0
145	30	45	69	81	51	51	0	0	0	0	0	0
146	374	561	860	1010	636	636	0	0	0	0	0	0
147	140	210	322	378	238	238	0	0	0	0	0	0
148	781	1172	1797	2109	1328	1328	0	0	0	0	0	0
149	247	371	568	667	420	420	0	0	0	0	0	0
150	202	303	465	545	343	343	0	0	0	0	0	0
151	170	255	391	459	289	289	0	0	0	0	0	0
152	35	53	81	95	60	60	0	0	0	0	0	0
153	71	107	163	192	121	121	0	0	0	0	0	0

DMATS Trip Table 2040

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	HBShopP	HBShopA	HBSRP	HBSRA	CVP	CVA
1	40	25	30	19	54	38	31	24	27	18	14	14
2	50	15	39	25	81	36	42	24	31	22	11	11
3	177	50	133	95	259	136	148	96	122	88	47	47
4	120	45	101	58	189	116	98	62	85	53	32	32
5	92	60	75	59	133	105	73	57	64	50	25	25
6	92	40	82	50	145	99	74	48	63	43	21	21
7	131	100	102	78	188	161	102	78	87	65	36	36
8	88	20	67	38	116	71	68	42	61	36	23	23
9	114	35	90	52	149	66	84	53	75	47	25	25
10	37	4	23	15	49	25	31	17	23	15	10	10
11	37	10	31	19	50	26	28	19	24	18	9	9
12	230	65	184	110	327	195	179	111	149	100	53	53
13	23	21	22	14	29	29	15	13	14	11	5	5
14	227	71	196	88	307	151	167	95	144	81	50	50
15	855	396	678	487	1323	844	715	481	574	428	223	223
16	503	105	379	225	685	416	381	232	336	210	117	117
17	565	160	447	339	872	463	480	341	396	313	168	168
18	358	792	296	445	710	869	349	415	258	335	156	156
19	1155	1038	971	916	2226	1545	1089	865	808	758	360	360
20	153	2432	97	1012	208	2119	123	771	99	626	130	130
21	290	55	219	147	430	213	246	151	203	139	76	76
22	84	10	67	28	115	58	65	33	58	28	19	19

DMATS Trip Table 2040 Continued.

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	HBShopP	HBShopA	HBSRP	HBSRA	CVP	CVA
23	2060	51	1608	736	2422	1139	1458	775	1242	726	416	416
24	388	25	305	188	663	233	350	202	273	185	110	110
25	76	345	62	147	107	319	63	132	51	99	43	43
26	928	438	738	538	1534	389	848	598	638	499	323	323
27	839	75	718	314	1110	226	586	324	546	301	167	167
28	31	1836	27	653	41	1569	23	541	21	391	123	123
29	814	142	638	373	1137	563	637	378	537	350	189	189
30	612	30	455	215	818	323	452	225	370	210	119	119
31	444	65	378	194	694	269	352	209	304	187	112	112
32	100	15	86	42	159	52	79	47	69	41	26	26
33	226	40	183	88	286	200	154	96	144	84	53	53
34	294	65	254	116	412	227	216	128	195	110	69	69
35	585	105	432	310	889	436	518	322	401	295	167	167
36	0	396	0	155	0	333	0	115	0	92	15	15
37	1695	909	1279	1236	2763	1858	1573	1227	1170	1099	577	577
38	898	145	684	485	1419	511	782	497	633	461	253	253
39	41	1811	31	409	48	1556	30	537	24	247	276	276
40	903	160	742	402	1408	737	719	424	605	382	223	223
41	518	3389	1713	9973	4016	6519	945	4528	371	579	1541	1541
42	3888	120	1113	606	3055	2517	7340	1157	903	585	614	655
43	290	493	250	194	366	567	201	238	184	151	127	127
44	603	394	526	355	909	713	475	359	411	304	167	167
45	3693	1889	2990	2120	5550	5291	3018	2233	2489	1897	1122	1122
46	482	1358	196	617	403	1374	278	537	212	420	162	162
47	922	840	777	714	1623	1163	834	723	652	606	335	335
48	99	29	69	67	182	29	101	67	74	62	33	33
49	14	314	8	53	21	275	12	97	10	34	64	64
50	203	392	151	203	397	459	212	227	146	164	114	114
51	16	2810	10	493	23	2375	19	822	10	295	507	507
52	0	15	0	6	0	13	0	4	0	4	1	1
53	11	1007	6	44	19	989	11	298	8	29	271	271
54	510	612	413	358	757	767	410	406	342	299	210	210
55	890	153	746	357	1148	625	631	365	573	334	183	183
56	327	62	305	143	531	187	245	146	223	134	74	74
57	13	4	8	20	22	36	15	21	9	19	11	11
58	95	25	73	38	117	70	67	38	57	34	17	17
59	302	15	231	119	399	154	232	126	195	116	68	68
60	144	13	127	52	188	541	97	54	94	50	28	28
61	1091	4	924	403	1516	634	802	427	727	401	232	232
62	1410	103	1194	550	1909	902	1047	581	920	536	310	310
63	192	38	164	87	251	250	134	87	123	80	43	43
64	602	634	481	463	841	955	476	434	409	370	174	174
64.5	674	0	539	264	947	470	536	280	458	263	152	152
65	276	1674	170	663	434	1618	244	618	210	444	211	211

DMATS Trip Table 2040 Continued.

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	HBShopP	HBShopA	HBSRP	HBSRA	CVP	CVA
66	188	91	166	107	283	202	148	102	123	92	44	44
67	87	10	74	37	130	62	71	38	59	35	19	19
68	863	10	798	259	1106	425	587	274	562	257	148	148
69	302	594	259	281	424	895	234	290	208	211	127	127
70	142	215	102	133	186	251	109	118	89	100	41	41
71	7	2463	6	943	9	2079	4	715	4	560	109	109
72	456	4	426	174	696	352	337	184	311	173	100	100
73	473	219	409	258	692	496	368	253	317	225	116	116
74	2372	20	1879	948	3111	1527	1719	1004	1549	942	544	544
75	2513	60	1902	916	3378	1423	1866	965	1681	903	518	518
76	614	0	472	247	804	477	433	262	388	246	143	143
77	87	120	88	74	164	162	72	68	61	56	25	25
78	576	689	458	473	934	1280	494	470	401	383	206	206
79	10	0	9	4	13	6	8	4	7	4	2	2
80	1620	1643	1312	1392	2635	2604	1395	1282	1094	1132	508	508
81	182	0	142	56	216	90	123	60	108	56	32	32
82	1004	634	781	661	1555	1253	879	639	674	565	283	283
83	245	2066	185	871	448	1737	246	677	175	546	128	128
84	306	331	276	349	675	556	310	329	222	295	139	139
85	409	448	321	327	588	455	339	311	271	263	127	127
86	864	354	688	505	1286	864	726	491	579	447	225	225
87	190	25	149	73	236	127	134	76	119	70	39	39
88	66	1206	48	284	87	1014	51	375	42	178	196	196
89	753	40	666	274	1235	543	584	286	498	267	151	151
90	51	20	46	23	66	38	36	22	33	20	10	10
91	23	175	22	76	30	160	14	59	15	48	11	11
92	118	20	78	58	175	72	98	59	86	55	30	30
93	38	0	33	12	66	16	29	13	24	12	7	7
94	11	16	11	10	15	30	7	9	7	7	3	3
95	28	54	23	32	40	64	23	27	21	23	8	8
96	63	10	52	26	81	42	45	26	40	24	13	13
97	197	57	150	106	303	161	164	111	135	99	57	57
98	1580	115	1268	716	2388	1024	1316	750	1050	697	397	397
99	7	679	7	254	10	577	5	199	5	152	36	36
100	1065	879	820	937	1802	1748	995	893	739	799	386	386
101	1091	165	880	592	1820	788	980	609	756	564	312	312
102	592	749	467	636	1068	1042	574	584	413	517	230	230
103	767	236	640	467	1388	740	724	472	525	430	232	232
104	0	30	0	12	0	25	0	9	0	7	1	1
105	0	20	0	4	0	17	0	6	0	2	3	3
106	1734	411	1386	903	2619	1329	1427	906	1178	835	444	444
107	1843	211	1440	903	3101	1288	1654	947	1262	872	499	499
108	1320	1494	1092	1230	2177	2486	1186	1154	910	1004	471	471
109	379	25	304	190	623	240	332	199	266	185	105	105

DMATS Trip Table 2040 Continued.

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	HBShopP	HBShopA	HBSRP	HBSRA	CVP	CVA
110	430	245	380	271	784	556	384	290	301	244	149	149
111	0	1733	0	665	0	1456	0	501	0	394	74	74
112	194	232	172	155	354	353	174	166	135	129	82	82
113	392	968	314	555	646	1048	345	479	276	405	152	152
114	1339	893	1081	980	2137	1596	1166	934	911	838	405	405
115	183	831	137	384	275	816	175	348	118	269	117	117
116	260	341	196	246	403	522	247	242	170	200	105	105
117	336	912	264	416	596	907	324	388	238	294	140	140
118	2641	14	2159	908	3384	1512	1965	962	1652	903	522	522
119	1838	241	1461	699	2374	1284	1393	770	1144	681	426	426
120	7	0	4	4	15	4	7	4	4	4	2	2
121	23	42	19	34	45	54	24	32	17	28	14	14
122	0	453	0	169	0	380	0	131	0	100	22	22
123	23	8411	21	3291	77	7205	30	2584	21	2008	490	490
124	55	96	39	84	108	140	63	85	40	71	40	40
125	85	668	65	316	164	683	94	307	59	231	121	121
126	148	115	120	160	367	214	177	159	112	143	75	75
127	66	303	53	162	164	307	80	144	50	117	48	48
128	121	1413	96	619	258	1311	127	539	87	416	160	160
129	23	55	18	41	48	68	24	39	16	33	16	16
130	178	66	138	143	345	213	186	146	126	133	74	74
131	33	119	25	64	66	130	35	58	26	47	21	21
132	753	1952	646	1151	1248	2241	656	1096	515	884	436	436
133	25	18	22	22	44	34	24	22	18	19	10	10
134	694	2268	581	1332	1285	2536	673	1143	488	975	359	359
135	974	267	813	521	1655	814	853	527	674	480	260	260
136	332	90	276	177	564	277	292	180	230	164	89	89
137	0	1529	0	575	0	1285	0	442	0	341	72	72
138	2209	3314	5082	5965	3756	3756	0	0	0	0	0	0
139	284	425	652	765	482	482	0	0	0	0	0	0
140	794	1191	1825	2143	1350	1350	0	0	0	0	0	0
141	1463	2194	3364	3949	2486	2486	0	0	0	0	0	0
142	563	844	1295	1521	958	958	0	0	0	0	0	0
143	1425	2136	3276	3846	2421	2421	0	0	0	0	0	0
144	10	15	23	27	17	17	0	0	0	0	0	0
145	30	45	69	81	51	51	0	0	0	0	0	0
146	520	780	1196	1404	884	884	0	0	0	0	0	0
147	140	210	322	378	238	238	0	0	0	0	0	0
148	1223	1835	2812	3302	2079	2079	0	0	0	0	0	0
149	457	686	1051	1234	777	777	0	0	0	0	0	0
150	202	303	465	545	343	343	0	0	0	0	0	0
151	170	255	391	459	289	289	0	0	0	0	0	0
152	35	53	81	95	60	60	0	0	0	0	0	0
153	71	107	163	192	121	121	0	0	0	0	0	0

Input I

	Project Info		Economic Vitality					Local & Regional Impact			Complete Streets	
NO	**Project Name**	**From & To**	Project promotes general economic development. **(answer Yes or No)**	Project specifically enhances or improves tourism. **(answer Yes or No)**	Project specifically improves or enhances movement of freight and services. **(answer Yes or No)**	Project improves or enhances movement of workers. **(answer Yes or No)**	Project improves access to jobs and business opportunities. **(answer Yes or No)**	Project will contribute to the local AND regional transportation system. **(answer Yes or No)**	Proposed project involves more than one Jurisdiction. **(answer Yes or No)**	Project improves access to other transportation facilities including air, water, rail, multimodal, etc. **(answer Yes or No)**	Project improves connectivity to a road classified as arterial or higher. **(answer Yes or No)**	Project integrates multiple modes of transportation including Bike, Pedestrain, transit, and auto. **(answer Yes or No)**
1	SW Arterial	US 151/61 to US 20										
2	North Cascade Rd	Edval Ln to Catfish Creek Bridge										
3	Kuaffman Ave	JFK to Carter & Carter to Central Ave										
4	Hales Mill Rd	Asbury Rd to Derby Grange Rd										
5	Monastery Road	Sundown to US 151										
6	Cedar Cross	725' E of Starlight Dr to Lake Ridge Dr										
7	Asbury Rd East	NW Arterial to University Ave	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes
8	Pennsylvania Ave	University Ave to Seipple Rd	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes
9	University Ave	Pennsylvania Ave to Delhi St	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes
10	JFK	NW arterial to Wacker to US 20	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes
11	Grandview Avenue Extension	32nd St to NW arterial	No	No	No	Yes	No	Yes	No	No	Yes	Yes
12	Rockdale Rd	Old Mill Rd to Maquoketa Dr	No	No	No	Yes	Yes	Yes	No	No	No	Yes
13	Loras Blvd	Univeristy Ave to Alta Vista	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes
14	US 52 Improvements	Central & White (9th to 22nd)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	Century Dr	Sylvan Dr to US 20	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes
16	Seventh St Reconstruction	Central Ave to Commerc	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
17	NW Arterial	US 20 to US 52	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
18	Sipple Rd	Asbury Rd to Pennsylvania Ave	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes
19	Asbury Rd West	NW Arterial to Seippel Road	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes
20	US 20 Improvements	Davon Dr to Old Highway										
21	US 20 Improvements	Old highway to Peosta										
22	US 20 Intersection Improvments	Swiss Valley Rd Interchange										
23	US 52 Improvements	NW arterial to City of Sageville										
24	US 20 Bridge	Bridge on Mississippi River										

Project Ranking - Input II

Input II

NO	Project Name	Traffic Volume Data								Crash Data						
		Estimated Improvement Cost - EC	Est. Improvement Life - Y	Other Annual Cost - AC (cost per mile $21,350/year for Rd system,)	Crash Reduction Factor - CRF CRF = 100*(1-(1-CRF1/100)*(1-CRF2/100)*(1-CRF3/100)*(1-CRF4/100)*(1-CRF5/100))	Discount Rate -INT	Length (mi)	Two-Way veh/day 2010	Two-Way veh/day 2040	First Full Year	Last Full year	Fatalities	Major Injuries	Minor Injuries	Possible Injuries	Property Damage Only ($2,700/for crash) Property damage
1	SW Arterial	$57,000,000														
2	North Cascade Rd	$1,074,000	30	11,102	90	4%	0.52	1,820	7,000	2001	2009					
3	Kauffman Ave	$720,500	30	10,889	60	4%	0.51	4,390	4,000	2001	2009					
4	Hales Mill Rd	$1,600,000	30	30,958	90	4%	1.45	1,910	1,896	2001	2009					
5	Monastery Road	$1,200,000	30	81,771	65	4%	3.83	1230	4600	2001	2009					
6	Cedar Cross	$3,331,565	30	9,394	90	4%	0.44	12,035	14,299	2001	2009					
7	Asbury Rd	$24,134,977	30	56,578	93	4%	2.65	13,950	17,144	2001	2009	2	11	69	219	$2,629,959
8	Pennsylvania Ave	34,611,895	30	89,457	95	4%	4.19	10,375	14,760	2001	2009	1	14	69	210	$2,700,541
9	University Ave	$11,693,329	30	13,194	97.3	4%	0.62	19,800	27,359	2001	2009	0	2	35	94	$1,474,849
10	JFK	$531,400	20	50,173	95	4%	2.35	22,400	27,380	2001	2009	2	16	103	328	$3,985,340
11	Grandview Avenue Extension	$3,600,000	30	12,383	95	4%	0.58	1	15,265	2001	2009	3	2	40	70	$1,064,364
12	Rockdale Rd	$4,170,000	30	16,226	71	4%	0.76	10,000	14,000	2001	2009	0	2	1	21	$365,489
13	Loras Blvd	$74,000	2	0	53	4%	0.66	11,200	11,250	2001	2009	0	2	19	48	$713,388
14	US 52 Improvements on Central & white	$2,313,000	30	31,171	95	4%	1.46	9,000	13,000	2001	2009	1	6	98	242	$3,185,018
15	Century Dr	$1,385,600	30	8,754	60	4%	0.41	3,970	5,020	2001	2009	0	1	10	29	$369,450
16	Seventh St reconstruction	$2,400,000	30	10,675	92	4%	0.5	1000	1000	2001	2009	0	0	1	2	$80,099
17	NW Arterial	$57,533,760	30	47,184	93	4%	2.21	24,800	42,000	2001	2009	5	8	76	176	$2,417,599
18	Seipple Rd	$2,664,000	30	15,372	95	4%	0.72	2,880	8,052	2001	2009	0	1	8	7	$161,800
19	Asbury rd	$7,250,000	30	39,071	93	4%	1.83	9,900	15,000	2001	2009	5	9	46	91	$1,295,710
20	US 20 Improvements															
21	US 20 Improvements															
22	US 20 Intersection Improvments															
23	US 52 Improvements															
24	US 20 Bridge															

NO	Project Name	Model Information						System Preservation		Accessiblity & Moblity			
		Vehicle Miles Traveled - VMT (miles) before Improvements	Vehicle Miles Traveled - VMT (miles) after Improvements	Vehicle Hours Traveled - VHT (hours) before Improvements	Vehicle Hours Traveled - VHT (hours) after Improvements	Average Speed of Vehicle Fleet (mph) before Improvements	Average Speed of Vehicle Fleet (mph) after Improvements	Surface Type (Concrete -1, Gravel -10)	Facility Condition	Existing Capacity	Future Capacity	Bike Lanes (1 = Yes, 0 = No)	Transit Routes (1 = Yes, 0 = No)
1	SW Arterial												
2	North Cascade Rd									12,060	12,060		
3	Kauffman Ave									11,590	11,590		
4	Hales Mill Rd									12,060	12,060		
5	Monastery Road									12,060	12,060		
6	Cedar Cross	2669388	2669388	78540.06	78540.06	28.78	28.78			13,800	13,800		
7	Asbury Rd	2669388	2,669,706	78540.06	78,507	28.78	28.75	1	76	11,240	13,910	1	1
8	Pennsylvania Ave	2669388	2,669,620	78540.06	78,521	28.78	28.82	1	39	13,910	13,910	1	1
9	University Ave	2669388	2,669,016	78540.06	78,515	28.78	28.81	1	36	22,480	22,480	1	1
10	JFK	2669388	2,667,979	78540.06	78,300	28.78	28.87	1	44	15,405	15,405	0	1
11	Grandview Avenue Extension	2669388	2,670,264	78540.06	78,429	28.78	28.8	1	98	0	14,010	1	0
12	Rockdale Rd	2669388	2,669,734	78540.06	78,525	28.78	28.75	1	35	11,590	11,590	0	0
13	Loras Blvd	2669388	2669388	78540.06	78540.06	28.78	28.78	1	45	11,240	11,240	1	0
14	US 52 Improvements on Central & white	2669388	2,669,523	78540.06	78,459	28.78	28.8	1	14	14,010	14,010	1	1
15	Century Dr	2669388	2669388	78540.06	78540.06	28.78	28.78			11,590	11,590	0	0
16	Seventh St reconstruction	2669388	2669388	78540.06	78540.06	28.78	28.78	1	14	11,590	11,590	1	0
17	NW Arterial	2669388	2676187	78540.06	78384.88	28.78	28.86	1	75	35,540	42,140	1	1
18	Seipple Rd	2669388	2669388	78540.06	78540.06	28.78	28.78	1	30	12,060	12,060	1	0
19	Asbury rd	2669388	2669490	78540.06	78491.29	28.78	28.82	1	38	11,240	13,910	1	0
20	US 20 Improvements												
21	US 20 Improvements												
22	US 20 Intersection Improvments												
23	US 52 Improvements												
24	US 20 Bridge												