

November 2014



MOBILIZING TOMORROW

A Transportation Plan for a
Greener Greater Des Moines

Amendments:
October 2015
August 2016
November 2016

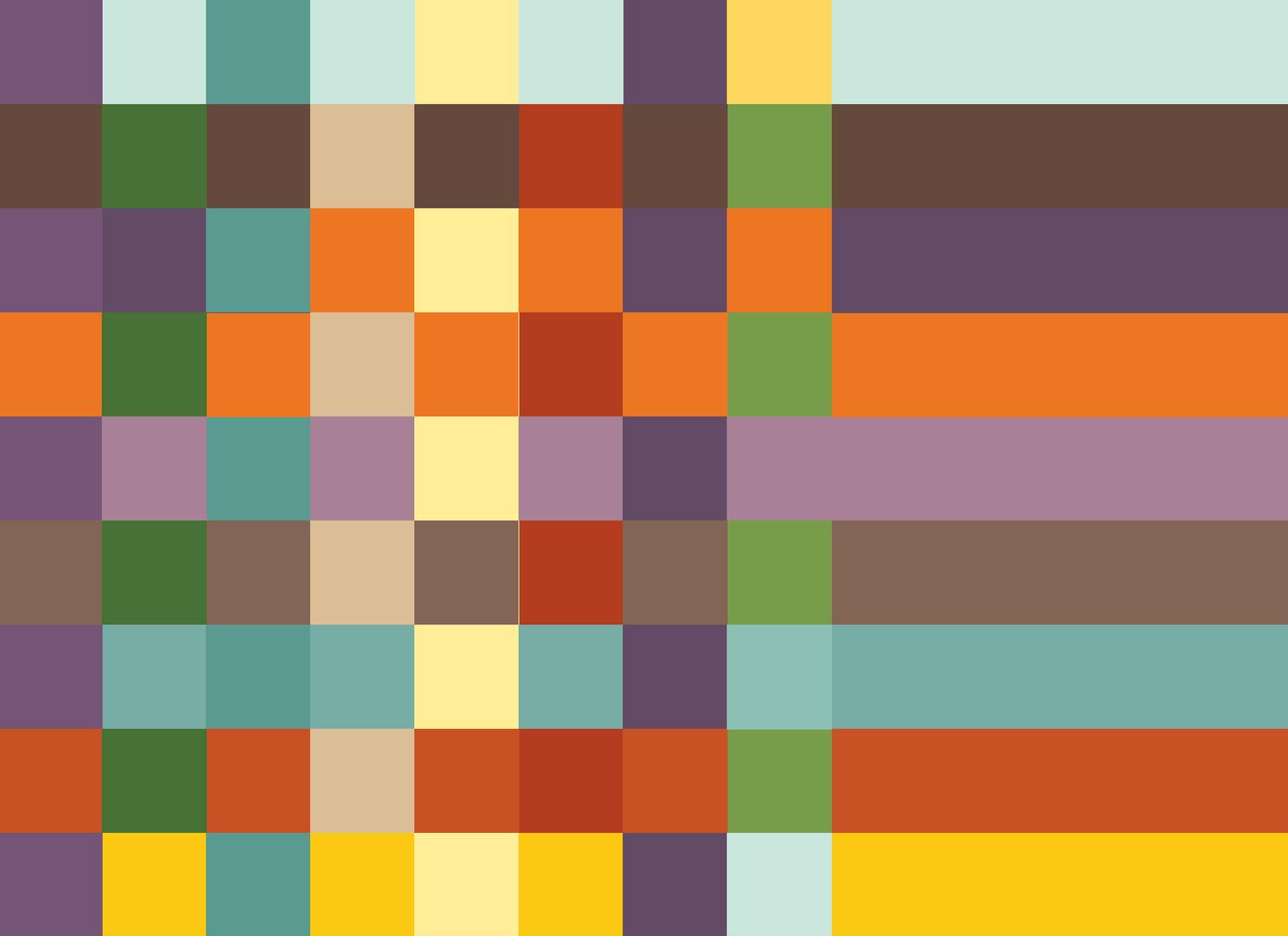
The Des Moines Area Metropolitan Planning Organization (MPO) has prepared this document with partial funding from the United States Department of Transportation's Federal Highway Administration and Federal Transit Administration, and in part through local matching funds provided by the Des Moines Area MPO member governments. These contents are the responsibility of the Des Moines Area MPO. The United States Government and its agencies assume no liability for the contents of this report or for the use of its contents.

The Des Moines Area MPO approved this document on November 20, 2014.

© 2014 Des Moines Area Metropolitan Planning Organization. Please call (515) 334-0075 to obtain permission for use.

CONTENTS

- Chapter 1: Introduction..... 3
- Chapter 2: Setting Our Sights..... 17
 - Goal 1: Enhance Multimodal Transportation Options..... 23
 - Goal 2: Manage and Optimize Transportation Infrastructure and Services..... 33
 - Goal 3: Improve the Region’s Environmental Health..... 47
 - Goal 4: Further the Health, Safety, and Well-Being of All Residents in the Region..... 55
 - Performance Measures Summary..... 65
- Chapter 3: Investment Strategies..... 69
- Chapter 4: Taking Action..... 83
- Chapter 5: Technical Resources..... 113
- Appendix A: Acronyms..... 153
- Appendix B: State of the Transportation System..... 157
- Appendix C: Demographics + 2050 Growth Scenario..... 177
- Appendix D: Fiscal Analysis Methodology..... 199
- Appendix E: Project Selection Methodology + Project List..... 211
- Appendix F: Environmental Analysis..... 253
- Appendix G: Public Comment..... 263
- Appendix H: Travel Demand Model Validation + Analysis..... 313
- Appendix I: Amendments + Revisions..... 324





1



INTRODUCTION

INTRODUCTION

From our short travel times to our early adoption of a bike sharing system, Greater Des Moines prides itself on an efficient transportation system. The transportation system underlies our strong economy and enhances our quality of life; we don't have to sit in traffic for hours on end, and we can choose to go automobile-free if we like.

Still, as demographics, desires, and dollars change, our transportation system must evolve into a more mature system that offers even more choice. Further, federal legislation is pushing a fix-it first mentality and compelling the region to look even closer at the impacts of investments.

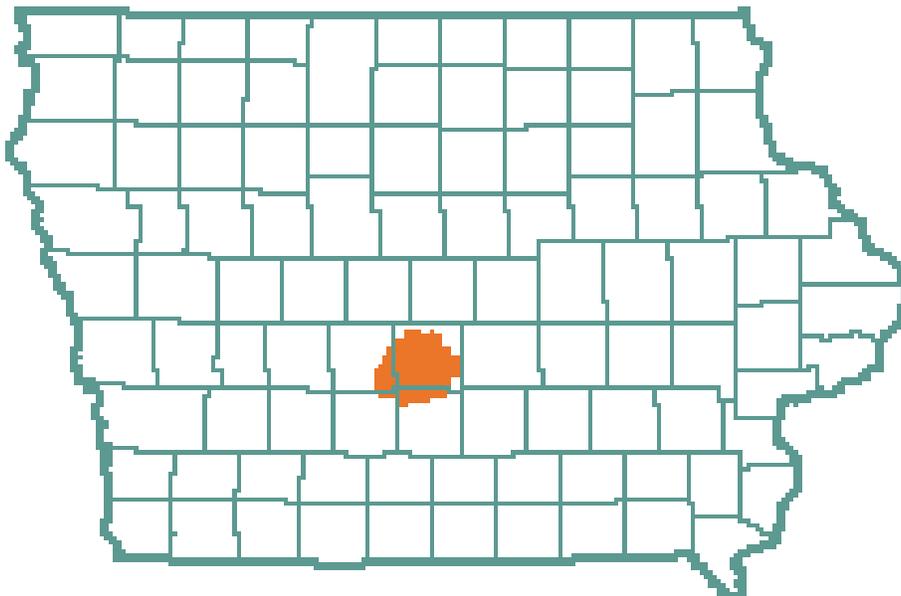
In this context, Greater Des Moines is planning ahead. This plan builds on success but also heeds an undoubtedly shifting future, hence the forward-looking title of Mobilizing Tomorrow.

The Des Moines Area Metropolitan Planning Organization

Federal legislation requires every urbanized area over 50,000 people to have a Metropolitan Planning Organization (MPO). MPOs ensure a continuing, cooperative, and comprehensive planning process. This legislation also requires that all surface modes of transportation be considered during the planning process. The Des Moines Area MPO fulfills this role for approximately twenty jurisdictions in central Iowa.

Full voting membership is open to any city or county government that is located wholly or partially in the designated Metropolitan Planning Area (MPA), has a population of at least 1,500 people, and signs onto the MPO's cooperative agreement.

GREATER DES MOINES
Metropolitan Planning Area



Currently, sixteen communities and three counties are voting members of the MPO:

- Altoona
- Ankeny
- Bondurant
- Carlisle
- Clive
- Des Moines
- Grimes
- Johnston
- Mitchellville
- Norwalk
- Pleasant Hill
- Polk City
- Urbandale
- Waukee
- West Des Moines
- Windsor Heights
- Dallas County
- Polk County
- Warren County

GREATER DES MOINES
Des Moines Area MPO Planning Area



The Des Moines Area Regional Transit Authority (DART) also is a voting member of the MPO.

The MPO includes three associate cities (Cumming, Indianola, and Van Meter) and one associate county (Madison). Associate members actively participate in the transportation planning process but do not have a vote at the MPO Policy Committee level. Associate membership is available to all governments within the MPO that do not meet the population threshold for full membership. It also is available to those governments located beyond the MPA limits but within the eight county central Iowa region.

Finally, the MPO also includes several advisory members, including the Des Moines International Airport, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Iowa Department of Transportation (DOT), and the Heart of Iowa Regional Transit Agency (HIRTA).

Our Transportation History

Greater Des Moines has joined together for decades to use resources effectively and to position the region to thrive economically, environmentally, and socially. Our leaders have long recognized the importance of working at the regional level, especially when it comes to transportation.

In 1964, the Des Moines Urbanized Area Transportation Study was initiated through a cooperative agreement between local officials and the Iowa Highway Commission. In 1965, the Central Iowa Regional Planning Commission (CIRPC) formed in response to a need for an area-wide transportation planning organization.

In 1972, CIRPC and seven local governments entered into a cooperative agreement for continuing transportation planning. The following year, in 1973, CIRPC restructured as the Central Iowa Regional Association of Local Governments (CIRALG). By 1979, CIRALG's membership included eight central Iowa counties and about eighty cities.

In 1983, the Des Moines Area Transportation Planning Committee (DMATPC), formerly part of CIRALG, was designated as the MPO for central Iowa. The DMATPC contracted with the City of Des Moines for staff support.

A decade later, in 1993, the DMATPC restructured once again as the Des Moines Area MPO, hiring its own staff.

In July 2013, the MPO celebrated the thirtieth anniversary of regional transportation planning in Greater Des Moines as it kicked off the development of Mobilizing Tomorrow.

The Long-Range Transportation Plan

One requirement of the MPO is to develop a long-range transportation plan (LRTP) that outlines a regional vision and strategy to address a region's long-term transportation needs. The MPO must update this plan at least once every five years.

This iteration of the MPO's plan has been dubbed Mobilizing Tomorrow, recognizing the tie to and working to bring life to The Tomorrow Plan, which is discussed later in this chapter.

Mobilizing Tomorrow looks out to the year 2050, falling in line with the time horizon laid out in The Tomorrow Plan and meeting the federal requirement of an LRTP looking out a minimum of twenty years. The plan is fiscally constrained and will be updated in another five years to reflect completed projects as well as any changes in priorities and/or funding. Any project that seeks to receive funding from the MPO must be included in the LRTP.

Previous Plans

Mobilizing Tomorrow continues the strong tradition of regional transportation planning in Greater Des Moines. The first plan, the 1990 Des Moines Urbanized Area Transportation Plan, was completed in May 1974.

Nearly a decade later, in 1983, the Year 2000 Street and Highway Plan was adopted to determine the major street and highway improvements needed in Greater Des Moines by the year 2000.

In October 1994, the region approved the Horizon Year 2020 Transportation Development Report. Much more robust than previous efforts, the 2020 plan looked at an integrated intermodal transportation system.

The Horizon Year 2025 Long-Range Transportation Plan, completed in 1999, built on the 2020 plan. The plan's primary goal was to "promote both the development and the preservation of a multimodal, intermodal transportation network that facilitates the safe and efficient travel of people, as well as goods, both within and outside the designated boundaries of the Des Moines Area MPO."

In September 2004, the MPO approved the Year 2030 Long-Range Transportation Plan, which recognized the need for a flexible plan able to adapt to regional needs over time.

The Horizon Year 2035 Metropolitan Transportation Plan was adopted in September 2009. Designed as a guide for the transportation system decision making process, the 2035 plan is replaced by Mobilizing Tomorrow.

Related Planning Efforts

The Tomorrow Plan

In October 2010, the US Department of Housing and Urban Development (HUD) awarded a consortium led by the MPO a \$2 million grant through its Sustainable Communities Regional Planning Grant program. A once in a generation investment in planning, the program aimed to promote regionalism and to break down silos that have traditionally existed between disparate entities. The grant program centers on six livability principles:

1. Provide more transportation choices.
2. Promote equitable, affordable housing.
3. Enhance economic competitiveness.
4. Support existing communities.
5. Coordinate policies and leverage investment.
6. Value communities and neighborhoods.

Since being awarded the grant, the MPO has cultivated relationships with dozens of community partners in addition to thousands of Greater Des Moines residents. The development of The Tomorrow Plan represented the most robust public engagement strategy in the region's history, making approximately 27,000 contacts. The insights gleaned from these relationships formed the plan, truly making it the community's plan and positioning the region to effectively and swiftly implement the plan. This input resulted in four over arching goals:

1. Create a resilient regional economy.
2. Improve the region's environmental health and access to the outdoors.
3. Further the health and well-being of all residents in the region.
4. Increase regional cooperation and efficiency at all levels.

In addition to each of these goals, the plan includes five initiatives. The initiatives are crosscutting, collaborative ideas for implementing the plan's top priorities. They include:

1. Nodes & Corridors: Encourage development in areas of maximum impact and connect these areas to one another with multimodal corridors.
2. Greenways: Build a fully-connected system of natural resource areas by selectively expanding the existing network of parks, conservation areas, open space, and trails.
3. Resilient Neighborhoods: Support the continued presence of strong, unique neighborhoods that provide a range of housing and transportation choices.
4. Regional Cooperation: Engage in regional cooperation to support stormwater management and infrastructure.
5. Everyday Stewards: Encourage residents to take an active role in bringing The Tomorrow Plan to life by implementing more sustainable everyday practices.

The MPO approved The Tomorrow Plan in November 2013. Mobilizing Tomorrow builds upon The Tomorrow Plan's goals and initiatives to provide a more specific blueprint for the transportation investments that communities must make to achieve the region's vision for a more sustainable future.



Capital Crossroads

The Greater Des Moines Partnership and the Community Foundation of Greater Des Moines spearheaded Capital Crossroads, a nine-month visioning process for central Iowa. The Capital Crossroads visioning process culminated in a road map to guide the area's path to short- and long-term economic growth. This initiative formed the foundation for the visioning phase of The Tomorrow Plan and, thus, Mobilizing Tomorrow.

Capital Crossroads is a broad look at the goals for the region's next five years, while The Tomorrow Plan takes a deeper look at a number of issues out to the year 2050. Moreover, Capital Crossroads focuses on a larger geographic region that includes all areas located within a 50-mile radius of the Iowa State Capitol, while The Tomorrow Plan focuses on the MPO's planning area. These two initiatives have been coordinated since the summer of 2010, when both were merely ideas. Since then, the Partnership, the Community Foundation, and the MPO have worked closely to align the two endeavors.

DART Forward 2035 Plan

As it has with Capital Crossroads, the MPO has closely coordinated with DART on its DART Forward 2035 Transit Services Plan since its beginning. The DART Forward 2035 Plan will guide the growth of the transit system in Greater Des Moines over the next twenty-five years and includes an alternatives analysis that explores different options for rapid transit. The DART Forward 2035 Plan contributes transit analysis and planning to The Tomorrow Plan and to Mobilizing Tomorrow. The three plans will have a dynamic relationship as the region implements elements of each.

Connect: The Central Iowa Bicycle & Pedestrian Transportation Plan

The MPO's Central Iowa Bicycle and Pedestrian Roundtable developed Connect: The Central Iowa Bicycle and Pedestrian Transportation Plan as an update to a 1981 bicycle plan for the Des Moines metropolitan area. Connect is an action plan to guide central Iowa's planning development process to improve accessibility and mobility by foot or by bicycle. The plan aims to help guide central Iowa toward transportation alternatives that are bicycle and pedestrian friendly and away from dependence on automobiles.

Connect addresses and targets levels of bicycle and pedestrian use and recommends projects, programs, and policies to improve safety, convenience, education, enforcement, engineering, encouragement, and frequency of walking and bicycling throughout the region.

Healthy Polk 2020

Healthy Polk is a movement of individuals, businesses, and community organizations focused on improving the quality of life and health status of people in the community. The latest plan, Healthy Polk 2020, began with 54 community conversations during which 750 people voiced their opinions about what a healthy Polk County might look like. From those conversations, a list of more than 900 priorities emerged. With much input, the list was winnowed to ten priorities, including increasing the availability of accessible, affordable public transportation and empowering more people to take responsibility for maintaining their health.

Special Studies

Over the past few years, the MPO has taken on a number of special transportation-related studies. These studies can be found on the MPO's website, www.dmampo.org.

Ames-Des Moines Transit Study

The MPO, the Iowa DOT, and the Greater Des Moines Partnership identified the Interstate 35 corridor between Ames and Des Moines as a potential corridor for enhanced public transportation options. As a result, the MPO developed a transit feasibility study in 2014. The study determined a market does exist for express bus service in the peak periods.

Energy Efficiency in Greater Des Moines

The Iowa Economic Development Authority awarded the MPO a State Energy Program Formula award in early 2014. The award aimed to develop energy reducing transportation strategies and policies. The MPO focused on three areas as part of this study: energy efficiency in Mobilizing Tomorrow, the development of a regional on-street bike feasibility study, and the development of a plan for electric vehicles and related infrastructure.

Freight Study

The MPO and its Freight Roundtable received a grant from the Iowa DOT to complete a study for a Des Moines area rail port facility. The study looked at transloading feasibility and analyzed both the market and infrastructure. The study also updated the MPO's list of freight impediments. The study found a need for a transloading facility and recommended a site in Des Moines at the intersection of the Union Pacific Railroad, the Iowa Interstate Railroad, the Norfolk Southern/Burlington Northern Santa Fe Railroad, and the Southeast Connector.

Stakeholder + Public Outreach

As a process, a plan is only as successful as the commitment of the participants who help form the concepts, believe in the vision, and further the recommendations towards implementation. To this end, the MPO built on the public outreach process conducted during the development of The Tomorrow Plan to glean more insights for Mobilizing Tomorrow. Please see Appendix G for more information on the public part

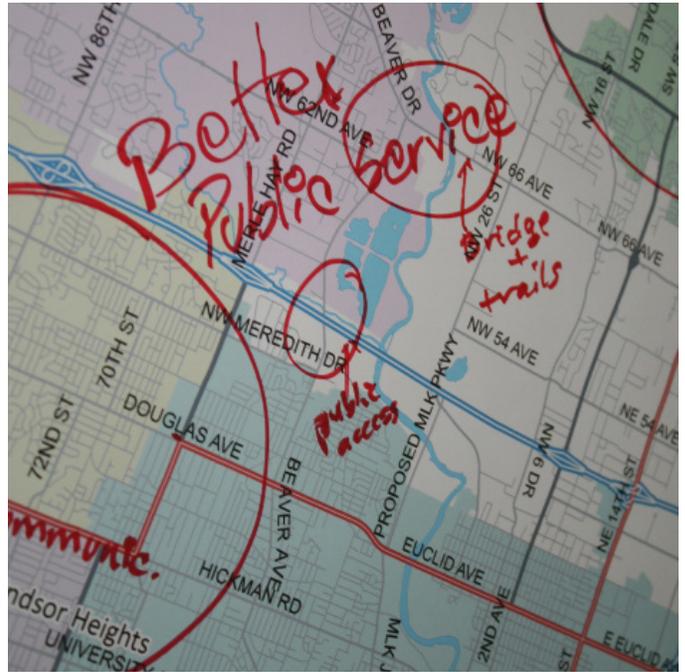
The Tomorrow Plan Insights

In 2012, the planning team for The Tomorrow Plan conducted a statistically-representative survey of Greater Des Moines. The survey asked respondents to rank certain types of projects they would like to see in the region. The following list ranks the projects by importance, with 1 being the most important and 14 being the least important; transportation projects are in bold.

1. Lower taxes
2. Increase school funding
3. Redevelop vacant properties
4. Enhance the stormwater system
5. Improve the public transportation system
6. Spend money to attract new businesses
7. Support local placemaking
8. Create new parks and conservation areas
9. Create new bicycle paths and facilities
10. Buy out floodplain properties and convert to open space
11. Expand the trail network
12. Build a major regional attraction downtown
13. Add more parking
14. Build more roads

Outreach Series 1

The MPO hosted the first input series in early 2014. Residents were asked to share their ideas on the transportation system at three public meetings as well as in an online survey. The MPO asked about current perceptions and experiences with the transportation system as well as how to allocate funds.



Participants drew problem areas on maps and explained what they thought were strengths and weaknesses of the system as well.

A survey found that getting to and from work each day in a consistent length of time is most important to Greater Des Moines residents. They also value having a roadway system that is kept in a state of good repair (i.e., pavement and bridge conditions). The survey also found that residents value being able to use different modes of transportation.

When the MPO asked about allocating its funding, maintaining existing roads and bridges received the top priority, followed by enhancing public transportation and supporting pedestrian + on-street bicycle facilities.

Outreach Series 2

The second outreach series placed an even larger focus on project funding. Specifically, the MPO wanted to understand which kinds of projects were most important to residents. The MPO developed a board game that allowed residents to consider the trade-offs between various kinds of projects before allocating limited funding.

The MPO also received comments from residents unable to attend the public events. These comments pushed for focusing more on maintenance, allocating fewer dollars to expanding roadways, supporting alternate forms of transportation, connecting Greater

Des Moines and Ames via public transportation, supporting high speed rail, and making the region more pedestrian and cyclist friendly, including adding protected bike lanes.

Beyond these general comments, the MPO also sought comments about specific projects submitted by member governments for inclusion in the plan. The MPO provided an online map with all of the proposed projects as well as data points related to crashes, level of service, pavement condition, and more. This tool enabled residents to take an in-depth look at the projects and provide comments at their leisure. The projects and comment form can be accessed online at www.dmampo.org.

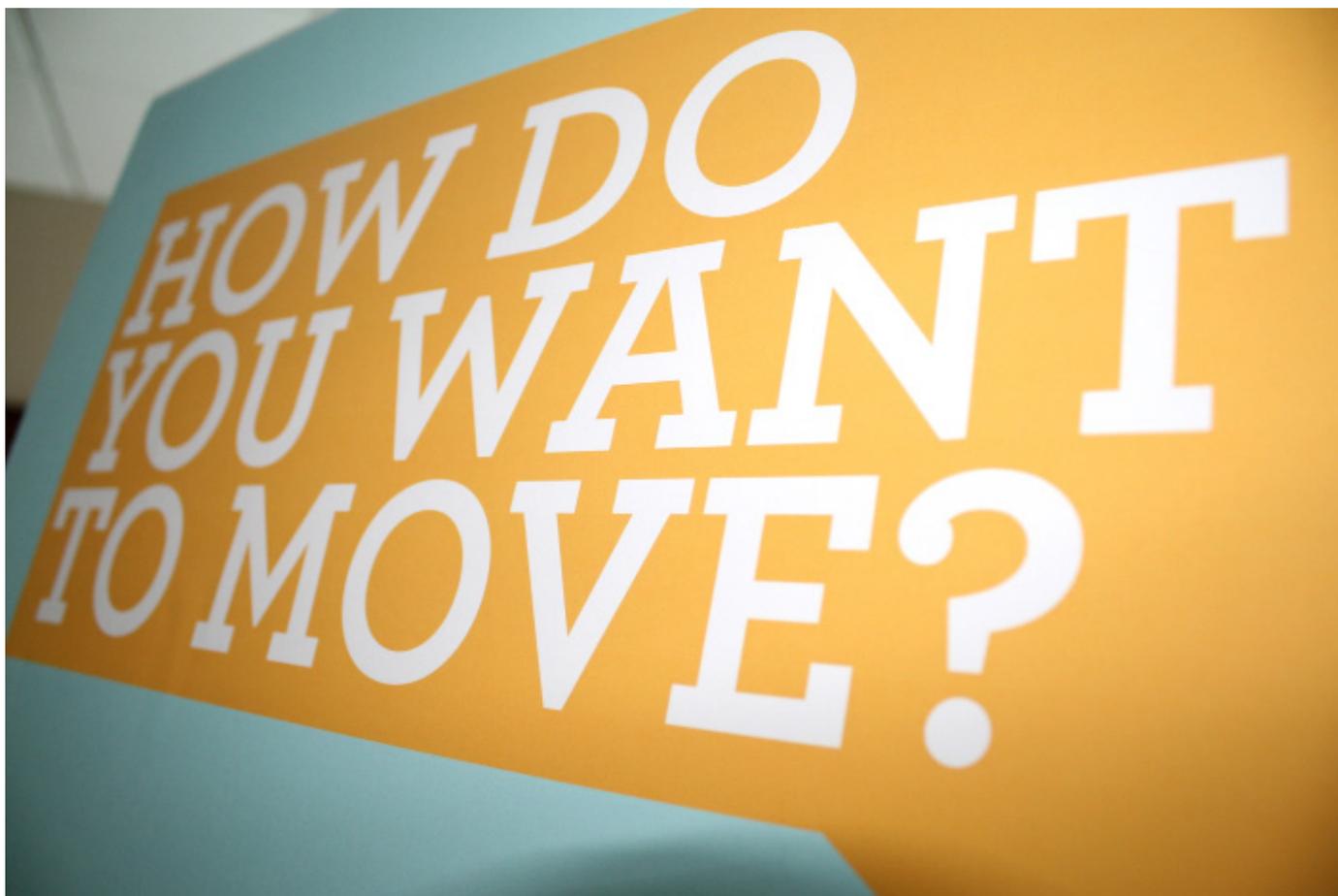
Outreach Series 3

The MPO held a final outreach series in September and October 2014. This series sought feedback on the final plan. Greater Des Moines residents generally supported the projects identified in the plan, voice support for the proposed investment strategy, and called for increased consideration of multimodal transportation strategies.

Socioeconomic Trends

Greater Des Moines has been included in a number of 'best of' lists over the past several years, including the Best Place for Young Professionals, the Best Place to Raise a Family, and among the Best Mid-Sized Cities for Jobs — all indicators the region is thriving. This success will lead to continued population and employment growth in the region. The population is projected to increase nearly 60 percent from 480,000 in 2010 to 751,000 by 2050. Likewise, the region's employment is expected to increase by 40 percent by 2050.

Understanding the makeup of this growth as well as the geographic allocation of the growth help the MPO understand potential impacts to the transportation system. For instance, the MPO anticipates tremendous growth in persons over 65 years of age, followed by moderate growth in those under 19 years of age. These demographic changes indicate more demand for multimodal transportation options as the over 65 and under 19 age cohorts generally drive less than the rest of the population.



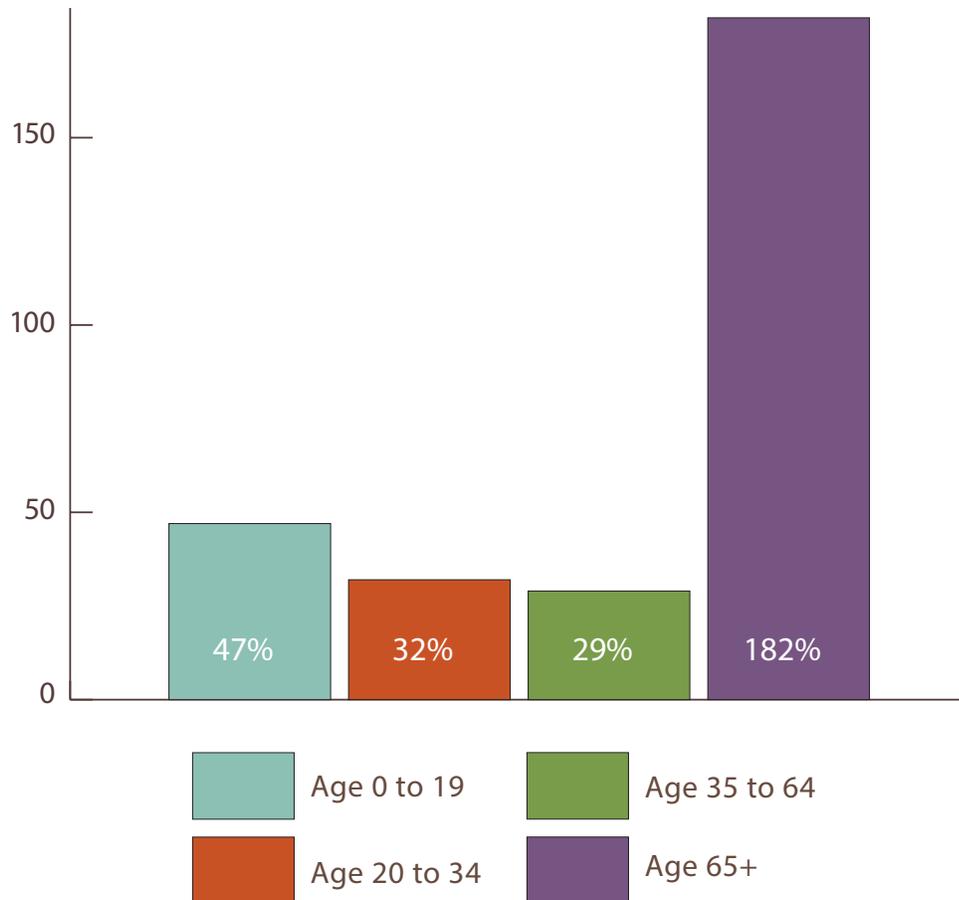
The geographic allocation of growth helps the MPO understand the impacts of land use decisions on the transportation system. To help determine how growth could impact the transportation system, the MPO developed a growth scenario for the year 2050. A growth scenario takes the anticipated regional growth and makes a best guess as to where the growth will occur throughout the region. To develop the 2050 growth scenario, the MPO worked with local governments to ensure consistency with local comprehensive plans and also to identify opportunities for

implementation of strategies recommended in The Tomorrow Plan. The concentration of households and jobs helps to determine what mode of transportation one might take. The growth scenario also can help determine which roads may see higher amounts of traffic as development increases. Appendix C provides more detailed information about the potential impacts of the MPO's 2050 growth scenario on the transportation system.

GREATER DES MOINES POPULATION FORECAST: 2010 TO 2050

MEASURE	2010	2020	2030	2040	2050
Population	480,000	558,000	614,000	677,000	751,000
Housing Units	202,000	235,000	259,000	285,000	317,000
Households	189,000	220,000	242,000	266,000	296,000

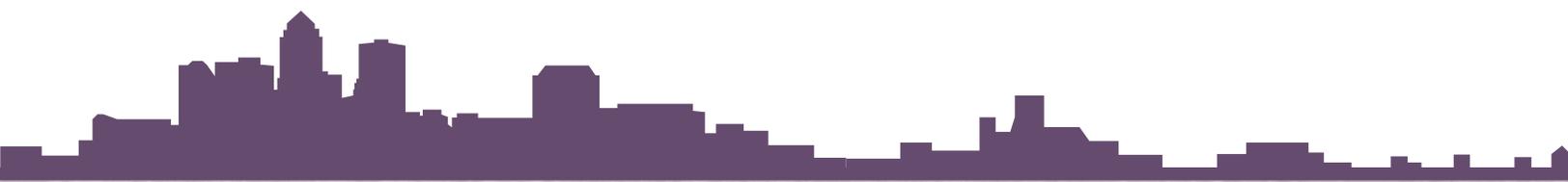
PERCENTAGE GROWTH IN GREATER DES MOINES AGE COHORTS: 2010 TO 2050



GREATER DES MOINES EMPLOYMENT FORECAST: 2010 TO 2050

INDUSTRY SECTOR	2010	2020	2030	2040	2050
Natural Resources and Construction	17,000	26,000	30,000	32,000	33,000
Manufacturing	15,000	15,000	15,000	16,000	15,000
Wholesale Trade	16,000	17,000	17,000	18,000	17,000
Retail Trade	35,000	36,000	37,000	39,000	42,000
Transportation and Utilities	11,000	12,000	14,000	15,000	17,000
Information	9,000	10,000	9,000	9,000	8,000
Financial Activities	48,000	51,000	53,000	54,000	53,000
Professional and Business Services	58,000	69,000	77,000	86,000	90,000
Educational and Health Services	44,000	57,000	66,000	75,000	85,000
Leisure and Hospitality	30,000	33,000	36,000	41,000	44,000
Other Services	17,000	20,000	21,000	24,000	25,000
Government	38,000	42,000	45,000	49,000	52,000
Total Non-Farm	338,000	388,000	420,000	458,000	481,000

HERE WE Grow

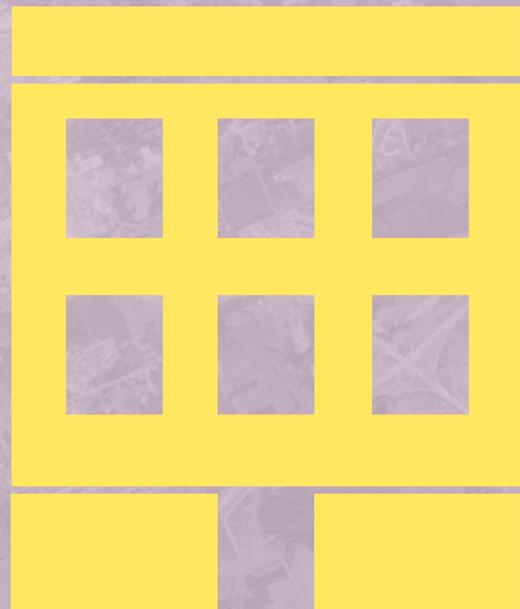


Projections shows a need for nearly 150,000 new housing units by 2050 to accommodate population growth

113,000
additional jobs in Greater
Des Moines by 2050

50

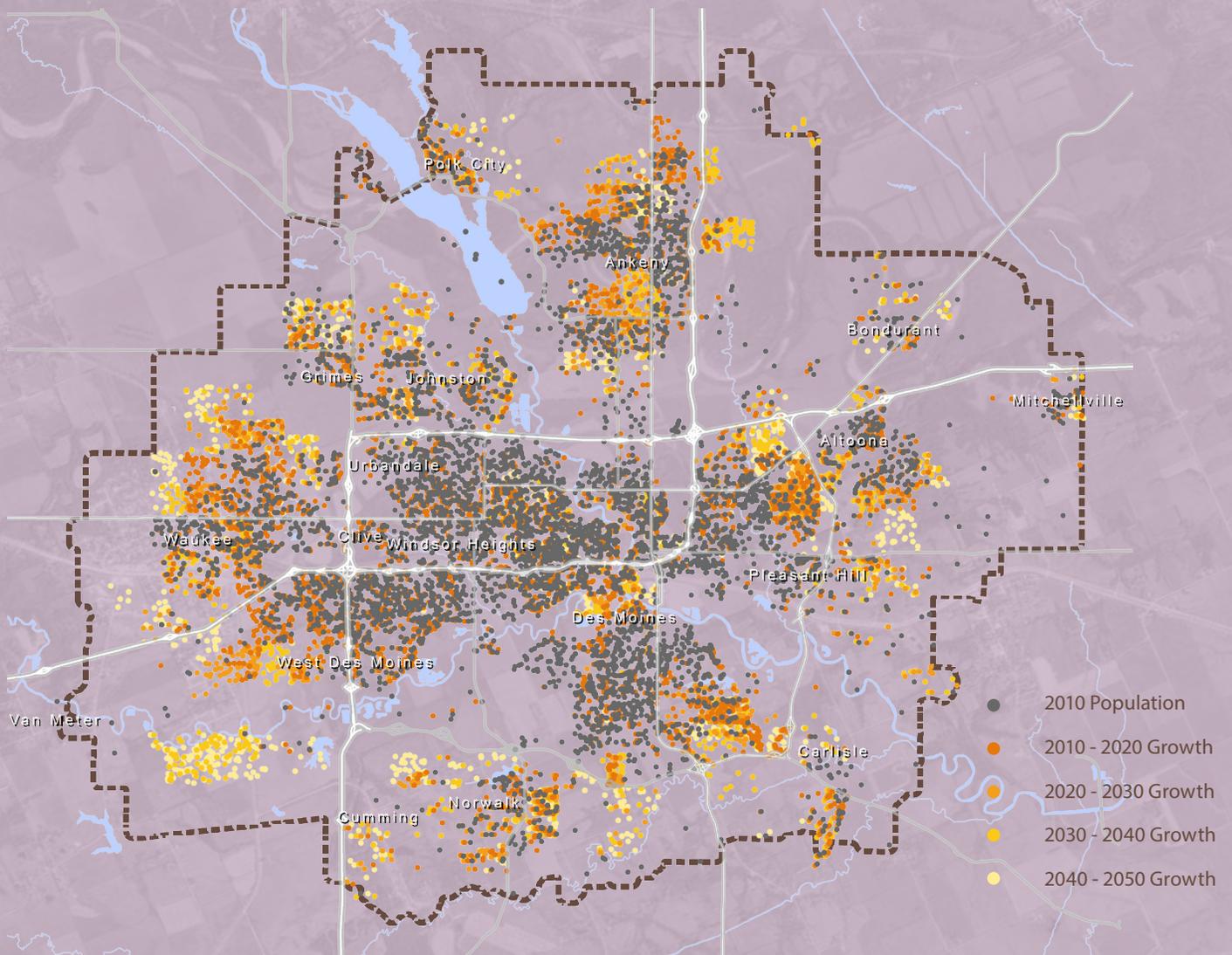
PERCENT
POPULATION
INCREASE
BY 2050

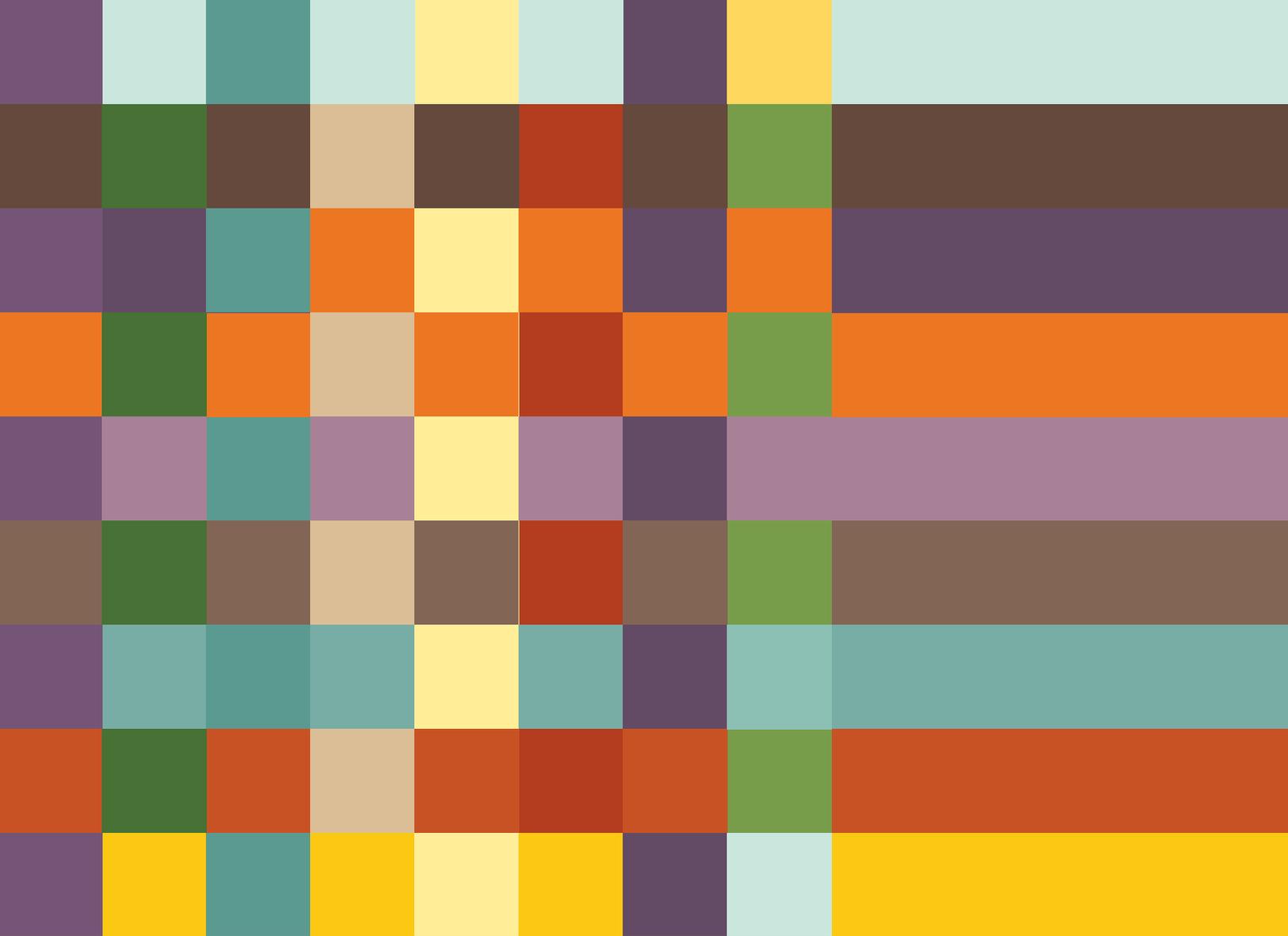


The growth scenario is the MPO's projected vision of future land use conditions in the planning area. The growth scenario considers numerous elements, such as population and employment figures. With these numbers in place, we can forecast the region's future mobility and accessibility needs, and allocate our funds accordingly. More information on this process is provided as part of the Technical Appendices section of the plan.

750,000

GREATER DES MOINES RESIDENTS BY 2050







2

SETTING
OUR SIGHTS

VISION

Greater Des Moines will be a collaborative, vibrant, and dynamic region of lasting value, equity, and diversity.



MISSION

Ever mindful of future generations, our mission is to cooperate across political boundaries to achieve social, economic, and environmental resilience for Greater Des Moines.



SETTING OUR SIGHTS

The high-level goals outlined on the following pages work as a system to direct Greater Des Moines toward a more vibrant transportation system. When realized, these goals will ensure the region continues to support a strong economy while protecting the environment. Fulfilling these goals also will enhance the great quality of life residents already enjoy in Greater Des Moines.

The current conditions analysis, measures, and targets associated with each goal were identified by the plan's steering committee and through public involvement. They will allow the region to understand the progress made in achieving our goals between now and 2050. These goals will not be achieved over night. Rather, they will be achieved by continual collaborative efforts in which all stakeholders take an active role.

MOBILIZING TOMORROW TERMS

GOALS are broad aspirations for the region.

MEASURES are quantitative descriptions that help us understand how the transportation system is performing.

TARGETS are quantitative descriptions for how we hope the transportation system will perform by 2050.

The MPO identified four goals for Mobilizing Tomorrow. The MPO sought to maintain consistency with the goals identified in The Tomorrow Plan. The Tomorrow Plan's goals were as follows:

- Create a resilient regional economy.
- Improve the region's environmental health and access to the outdoors.
- Further the health and well-being of all residents in the region.
- Increase regional cooperation and efficiency at all levels.

The MPO also considered the eight planning factors, outlined by the US Code of Federal Regulations, that an MPOs is required to consider in its transportation planning process. These planning factors include:

1. Support economic vitality.
2. Increase safety of the transportation system.
3. Increase the security of the transportation system.
4. Increase the accessibility and mobility of people and freight.
5. Protect and enhance the environment and promote conservation.
6. Enhance the integration and connectivity of the system across and between modes.
7. Promote efficient system management and operations.
8. Emphasize the preservation of the existing transportation system.

Mobilizing Tomorrow Goals

1. Enhance multimodal transportation options.
2. Manage and optimize transportation infrastructure and services.
3. Improve the region's environmental health.
4. Further the health, safety, and well-being of all residents in the region.

		Mobilizing Tomorrow Goals			
		Enhance multimodal transportation options	Manage and optimize transportation infrastructure and services	Improve the region's environmental health	Further the health, safety, and well-being of all residents in the region
The Tomorrow Plan Goals	Create a resilient regional economy	●	●		●
	Improve the region's environmental health and access to the outdoors.	●		●	●
	Further the health and well-being of all residents in the region.	●			●
	Increase regional cooperation and efficiency at all levels.	●	●		●
Planning Factors	Support economic vitality.	●	●	●	●
	Increase safety of the transportation system.	●	●		●
	Increase the security of the transportation system.	●		●	
	Increase the accessibility and mobility of people and freight.	●	●		●
	Protect and enhance the environment and promote conservation	●	●	●	●
	Enhance the integration and connectivity of the system across and between modes.	●			●
	Promote efficient system management and operations.	●	●		
	Emphasize the preservation of the existing transportation system.		●	●	

GOAL 1:

Enhance Multimodal Transportation Options

“Transportation Existing and Proposed Conditions,” a Nelson\Nygaard report developed as part of The Tomorrow Plan, found that 92 percent of trips in the planning area are made by personal automobile. Today, the average vehicle trip within the planning area takes 25 minutes and covers a distance of 15 miles. The natural and historical reaction to growth trends is toward the expansion of roadway capacity.

Like The Tomorrow Plan, Mobilizing Tomorrow envisions shifting from that historical model due to changing demographics, travel patterns, and rates of car ownership. This goal supports a greater mix of transportation choices, including a robust transit network, an active carpool culture, and land use and design that support walkability. To shift this perspective, Mobilizing Tomorrow lays out bold targets for the year 2050.

Current Conditions

The region's roadway network operates at enviable levels. In 2010, 72.1 percent of the roads operated in a free flowing manner, moving automobiles in a continuous, steady manner. Traffic generally flows at or above the posted speed limit, and motorists have mobility between lanes while also enjoying a high level of physical and psychological ease.

The network operates with significant capacity — in effect, as many people can move throughout the region as want to with almost no perceptible delay. Though the region expects to see a significant population increase by 2050, the MPO has found that, without any future capacity enhancements to the street system, the road network still would not experience unstable or broken flows. Over 90 percent of the roadways would still operate at a free flow.

While the road network provides efficient commutes and creates conveniences for motorists, this oversupply of capacity hinders the further development of other transportation modes. Greater Des Moines must invest in a complete transportation system — beyond one geared solely towards automobiles — if it is to become a more sustainable region.



Measures

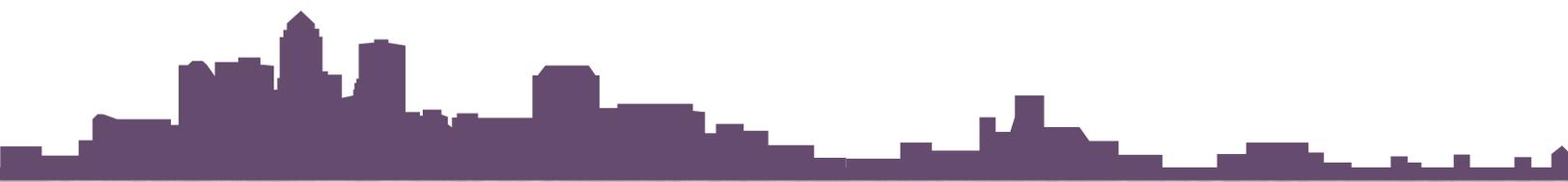
The MPO has identified several measures to track the progress we make towards enhancing multimodal transportation options. These relate to all modes of surface transportation:

- Automobiles, including both single occupant vehicles as well as those that choose to carpool;
- Public transportation;
- Walking; and,
- Biking.

Specifically, the MPO is looking at miles of on-street bicycle facilities; transit ridership; and, mode choice/split during peak hour — That is to say, how are people getting to downtown using the various modes during the morning and evening commute times?



ALL ABOUT Choice



77 PERCENT OF PEAK HOUR TRIPS TO DOWNTOWN ARE MADE BY SINGLE OCCUPANT VEHICLES



12 PERCENT INVOLVE CARPOOLING

MODE SPLIT n 1 The varying proportions of different transportation methods that may be used at any one time. The choice of mode may be determined by the costs, destinations, capacities, and frequencies of the modes.

A mature transportation system offers a mix of transportation choices, including a robust transit network. Regional leaders are ready to invest in a complete transportation system that serves the region and prioritizes multimodal corridors. To maximize access and to operate a system most efficiently, the region should try to match transit service to where people live and work.



We define 'peak hour'
from 7:15 to 8:15 am and
from 4:15 to 5:15 p.m..

By 2050, the region wants to see these numbers at 55, 20, 15, and 10 percent, respectively.

7

PERCENT
ARE MADE
VIA TRANSIT



4

PERCENT ARE
POWERED BY
PEOPLE WALKING
OR BIKING

PEDAL Power

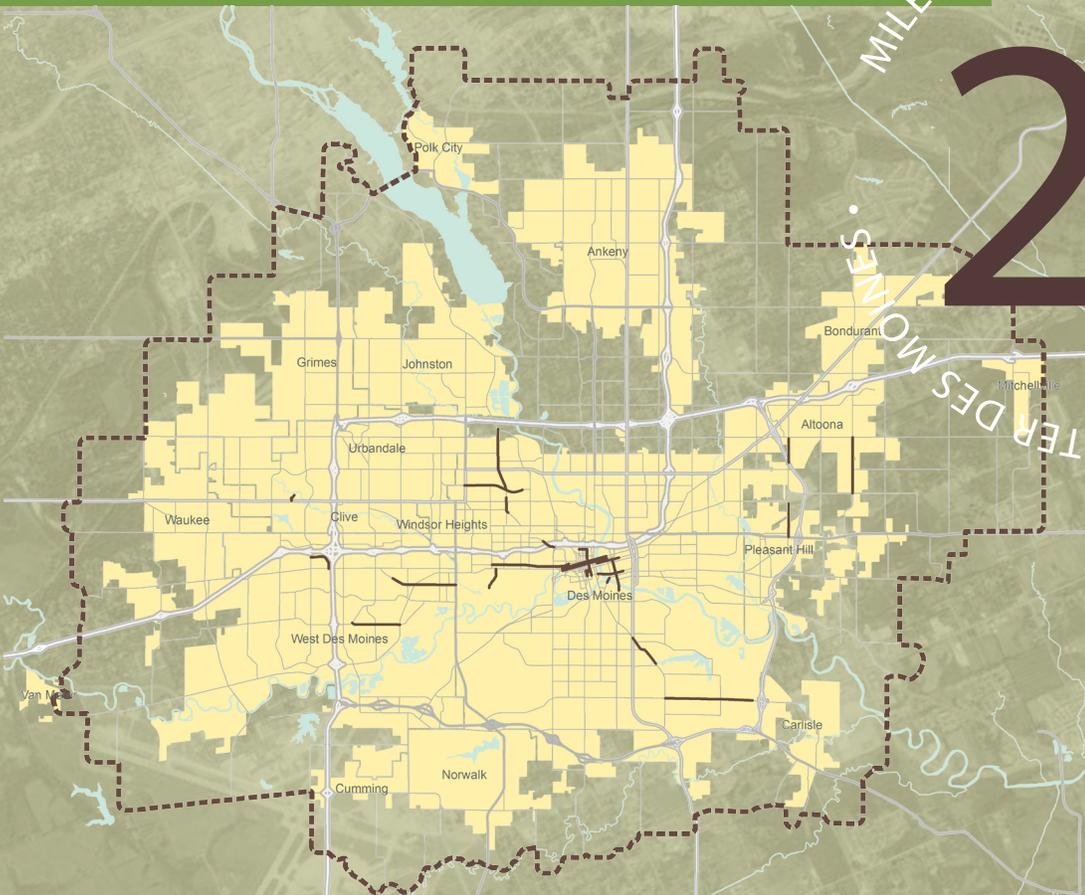
ON-STREET FACILITIES

On-street bicycle facilities enhance transportation options for a region. These facilities may include shared lane markings, which are used on roadways with low speed differentials between motorists and cyclists; bike lanes, which provide exclusive space for cyclists; buffered bike lanes; and, cycle tracks, which are physically separated from the roadway.



Source: Bicycling Magazine

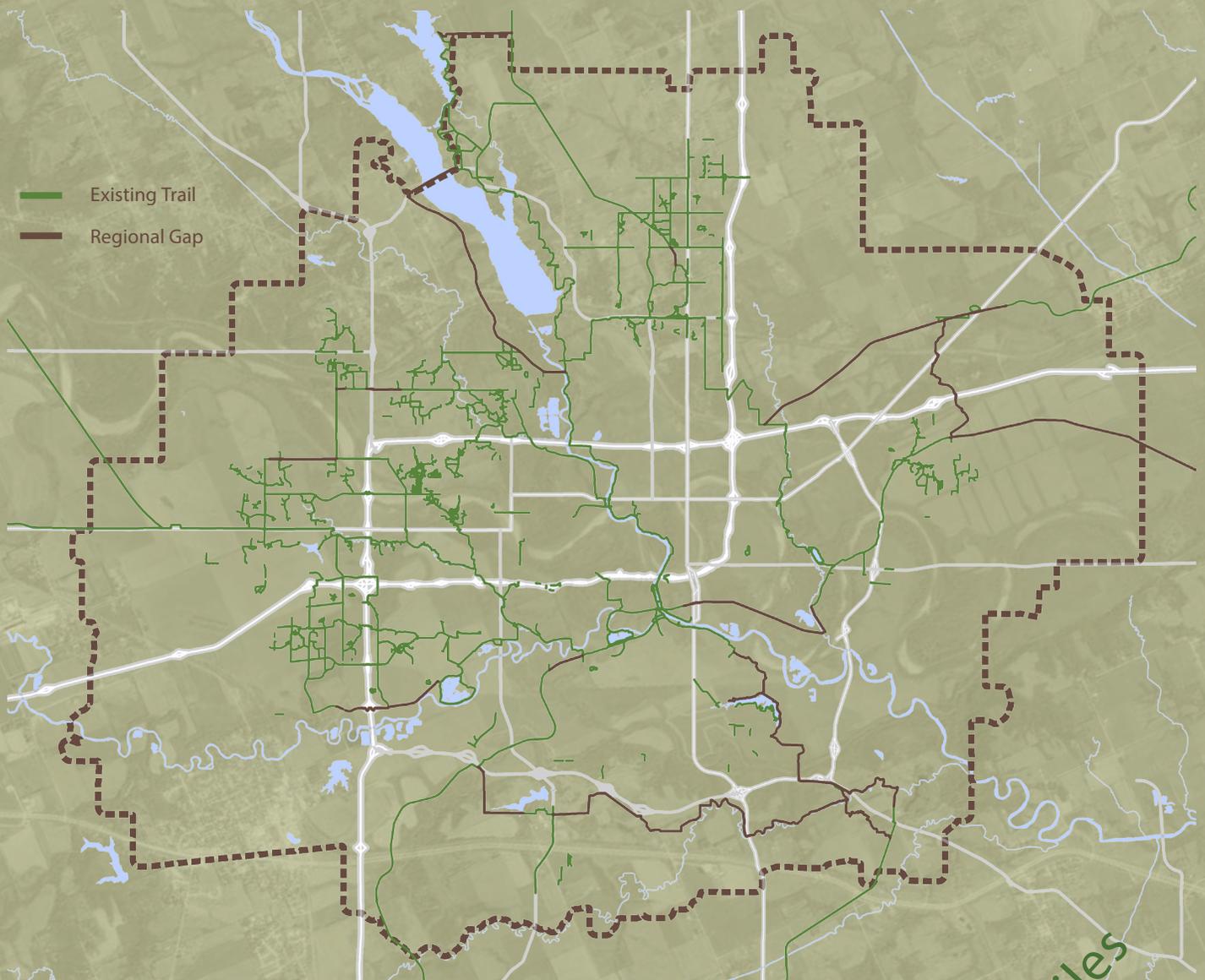
MILES OF EXISTING ON-STREET BICYCLE FACILITIES IN GREATER DES MOINES • 26



The goal: 400 miles of on-street facilities by 2050.

On- and off-street bicycle facilities offer multiple benefits for a region. Determining where gaps exist in this network is critical in determining how the MPO allocates funds for trails as well as in where the region implements on-street solutions. Gaps in the bicycle system inhibit the use of cycling as a viable mode of transportation.

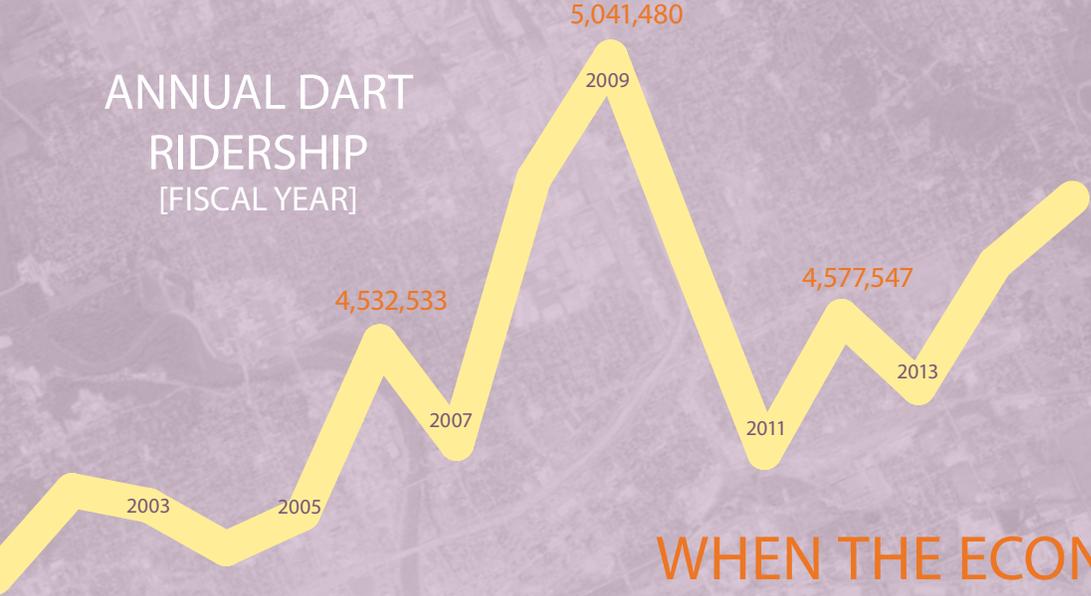
CYCLING ISN'T JUST FOR RECREATION; IT'S AN ACTIVE MEANS OF TRANSPORTATION.



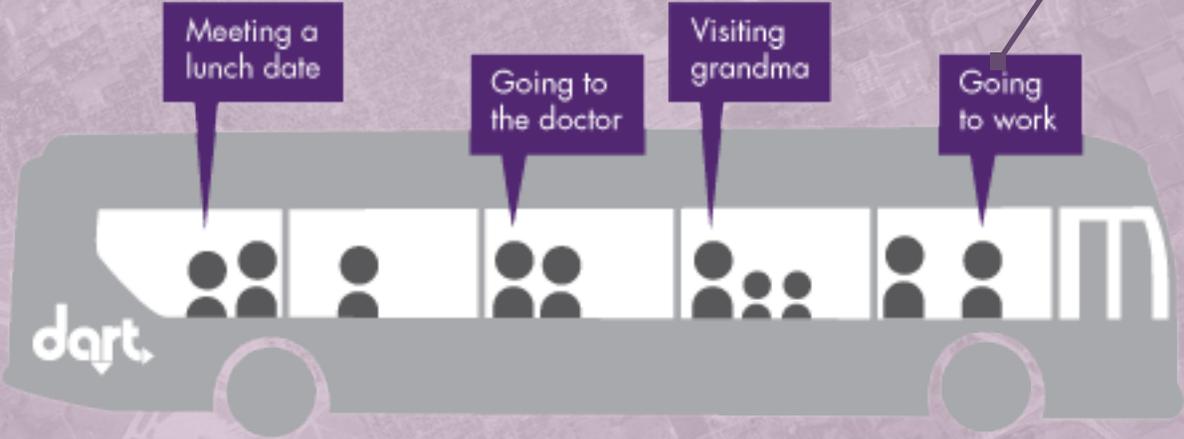
14 trail gaps totalling 66 miles

TRANSIT Trends

ANNUAL DART RIDERSHIP [FISCAL YEAR]



WHEN THE ECONOMY'S DOWN, TRANSIT RIDERSHIP OFTEN INCREASES — DART HAD RECORD RIDERSHIP IN 2008-2009



One recurring desire that emerged from the public during the planning process was being able to take transit to important destinations. To accomplish this, the region is looking to align routes based on existing and planned densities of residents and employees. Matching transit service with where people live and work is the best way to maximize access and to operate a system most efficiently. It also is important that transit stops are accessible by bicycle and by foot.

Since 2006, bike + ride trips have more than tripled. In 2013, over 52,000 trips included both bikes + buses.

MULTIMODAL adj 1 characterized by several different modes of activity or occurrence 2 intermodal 3 combined transport 4 involving of using several modes or methods

Daily DART Mileage

2,777 miles one way
3.6 times daily

One weekday of DART mileage (10,000) = 3.6 trips between LA and NYC

Targets

Greater Des Moines aspires to offer a mature transportation system that empowers residents to choose which mode they want to use. To do so, the MPO has identified several targets for the region to work towards.

MEASURE	CURRENT	2050 TARGET
Bicycle System On-Street		
Miles of On-Street Facilities	23	400
Mode Choice/Split (Peak Hour Trips to Downtown) [%]		
Single Occupancy Vehicles	77	55
Transit	7	20
Carpool	12	15
Walk/Bike/Work from Home/Other	4	10
Transit		
Total Ridership (Fiscal Year 2014)	4,400,000	8,800,000

GOAL 2:

Manage and Optimize Transportation Infrastructure and Services

In 2012, Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law as the nation's transportation authorization bill. MAP-21 transforms the framework for investments to guide growth and development of infrastructure.

"This is a good, bipartisan bill that will create jobs, strengthen our transportation system and grow our economy. It builds on our aggressive safety efforts, including our fight against distracted driving and our push to improve transit and motor carrier safety. The bill also provides states and communities with two years of steady funding to build the roads, bridges and transit systems they need. We look forward to working with Congress, states and local communities to put this bill to work quickly and effectively."

- Former US DOT Secretary Ray LaHood

MAP-21 focuses on a fix-it first mentality, encouraging regions to prioritize the protection of prior investments and to improve upon their safety and reliability.

Current Conditions

As previously mentioned, Greater Des Moines prides itself on its short travel times. Regional commute times are short, and roadway users rarely run into congestion. In fact, over 98 percent of Greater Des Moines roads are not congested. Thus, when commuters are forced to slow down a bit, they sometimes express frustration despite the fact that most people around the world would not consider area roads to be congested.

Poor bridge conditions, an aging public transportation fleet, deteriorating pavement conditions, and freight impediments balance the short travel times in Greater Des Moines. A recent study, *Rural Connections: Challenges and Opportunities in America's Heartland*, by the National Transportation Research Group found that Iowa bridges rank third worst in the nation. At the same time, 18 percent of DART's fleet is beyond its useful life.

Further, the MPO looks at the average Pavement Condition Index (PCI) across Greater Des Moines. This tells roadway users what level of quality they can expect when driving on roadways. PCI scores range from 0 to 100, with 100 being the best possible score. The average for the entire region is 60; the state aims to maintain an average of 62.5 — good condition — for the entire state-owned network.

A final consideration in understanding how well the regional transportation system operates is the freight network. The freight network plays a key role in moving goods in and out of the region, thus enhancing economic opportunity across the region. However, a number of transportation-related impediments prevent this system from operating at peak efficiency. It is the region's goal to eliminate all of these impediments by 2050.

Mobilizing Tomorrow seeks to balance investments in the different modes of transportation in hopes of bringing all aspects of the network in line with the plan's — and the region's — goals.



Measures

The MPO has established multiple measures to understand how well we are managing our transportation infrastructure. These cover all aspects of the transportation system, including bridge safety, public transportation vehicles, roadway capacity, and freight.

The MPO looks at these various elements in order to better understand how the transportation system as a whole is operating. This look at the condition of the following measures allows the region to determine what kinds of investments are most critical and where those investments should be made geographically. The measures that will help the MPO track its progress in managing and optimizing transportation infrastructure and services include:

- Pavement condition;
- Average bridge sufficiency;
- Percent of deficient bridges;
- The average age of DART's fleet;
- The number of DART vehicles beyond their useful life;
- Non-congested roads; and,
- The number of freight impediments.



"The most meaningful way we can maintain the quality we enjoy at reasonable costs is to do more with less. This is an effort in which all of us must be involved."

EJ Giovannetti
Former Polk County Supervisor

THE CONGESTION Question

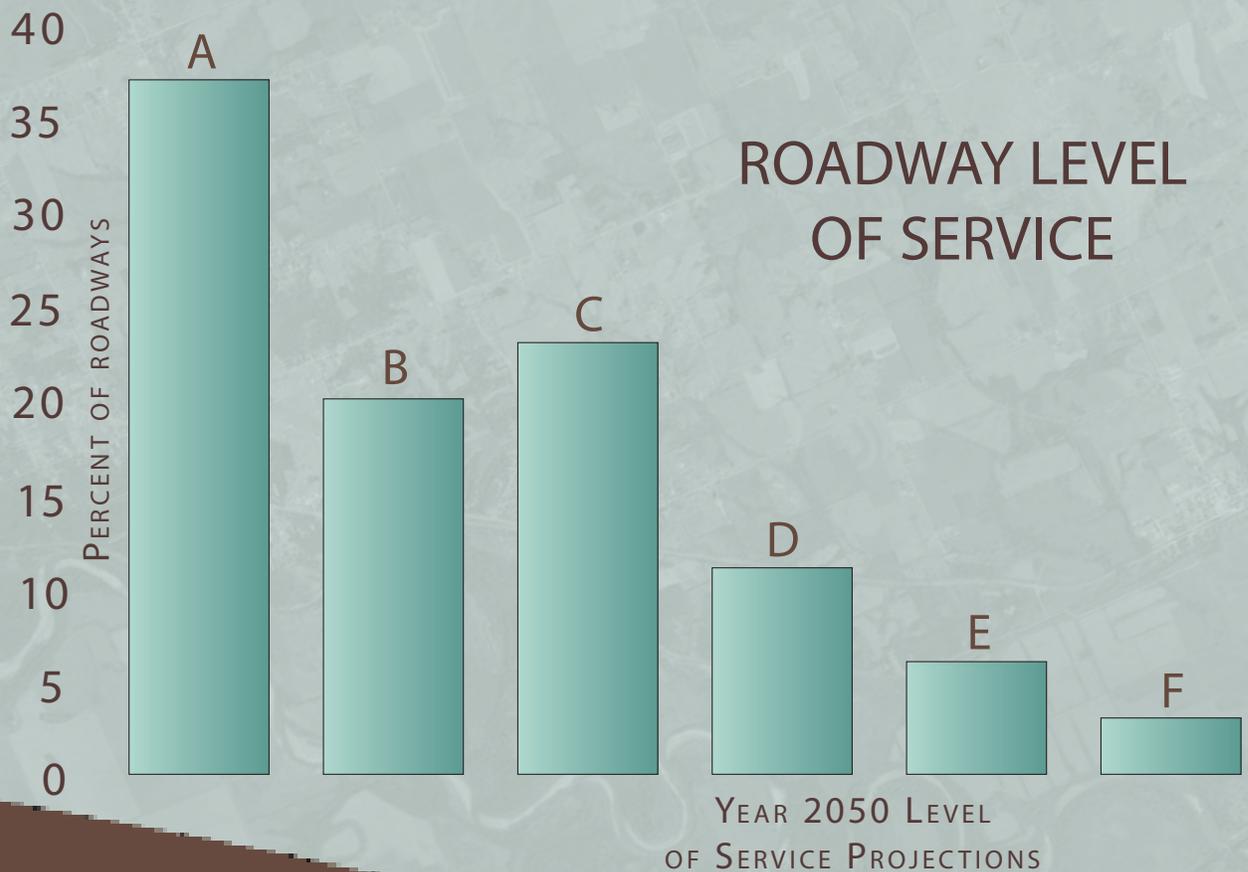
TRAFFIC CONGESTION n 1 a condition on road networks that occurs as use increases, and is characterized by slower speeds, longer trips, and increased vehicle queueing 2 a situation in which the interaction between vehicles slows the speed of the traffic stream

98.2

PERCENT OF ROADS IN THE REGION THAT ARE FREE OF CONGESTION

Even without roadway capacity additions, projections don't show significant congestion in Greater Des Moines.

Transportation planners and engineers frequently look at Level of Service (LOS) to evaluate how our roads are performing. Specifically, LOS indicates how well traffic is flowing. LOS is measured by calculating automobile volume to roadway capacity. LOS is represented using letters A through F, with A indicating free flowing traffic and F representing gridlock.



LEVEL OF SERVICE	WHAT'S IT MEAN?
A	Free flow. Motorists proceed at or above the posted speed limit and have total maneuverability between lanes at all times.
B	Reasonably free flow. Speed is maintained at A level of service, but maneuverability between lanes is somewhat restricted.
C	Stable flow. Traffic still flows at or near free flow conditions. Posted speed limit is maintained, but maneuverability between lanes requires noticeably more driver awareness.
D	Approaching unstable flow. Speeds begin to decrease and maneuverability is limited. Driver comfort diminishes.
E	Unstable flow. Traffic flow becomes inconsistent with rapid variations in speed. Almost no usable gaps remain in traffic. Any incident can cause significant delays.
F	Forced or breakdown flow. Traffic gridlock with frequent slowing and unpredictable travel time. Road is in a "traffic jam" condition.

FREIGHT Flaws

16 FREIGHT IMPEDIMENTS IN THE REGION

STRUCTURAL IMPEDIMENTS

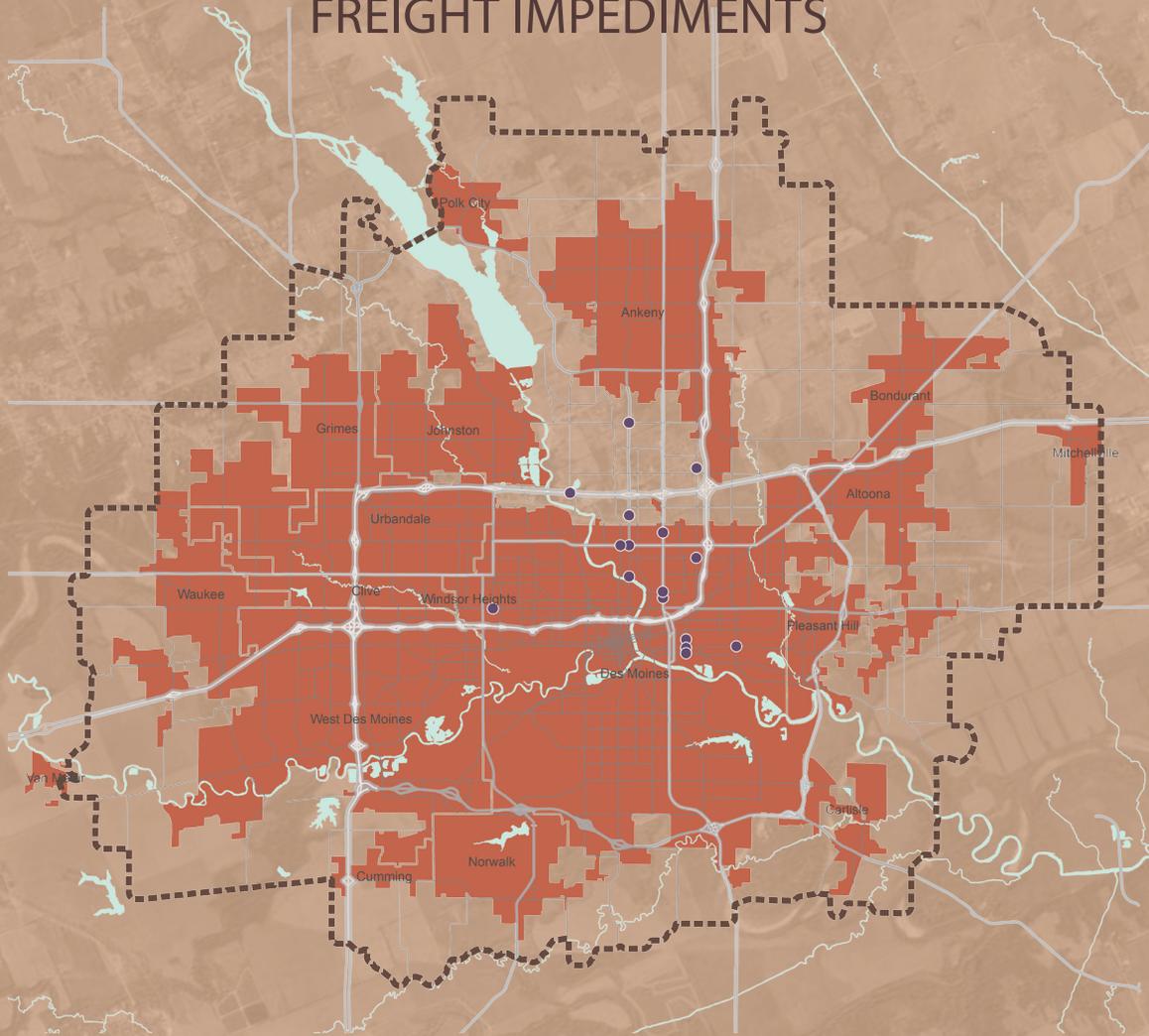
Structural impediments may include overpasses that are too low for trucks or trains to clear, intersections that trucks can't navigate, and bridges with weight restrictions that can't accommodate trucks and/or trains.

OPERATIONAL IMPEDIMENTS

Operational impediments may include corridors with traffic volumes that impede truck movement, one-way streets that restrict access, trips that result in empty trucks traveling long distances, or extended time at loading and unloading destinations.

Goods movement is the transportation of for-sale products from where they're manufactured and/or harvested to where they'll be sold. This can take place via ship, airplane, rail, truck, or some combination thereof. In Greater Des Moines, goods movement centers on rail and trucks. Though goods movement wouldn't be possible without it, our transportation system presents some challenges to this process.

FREIGHT IMPEDIMENTS



**ENHANCING THE REGION'S
FREIGHT NETWORK WOULD
SUPPORT GOODS MOVEMENT**

BRIDGING the Gap

Bridges are rated on a scale of 0 to 100, with 100 representing a bridge that meets all standards.

AVERAGE BRIDGE SUFFICIENCY RATINGS

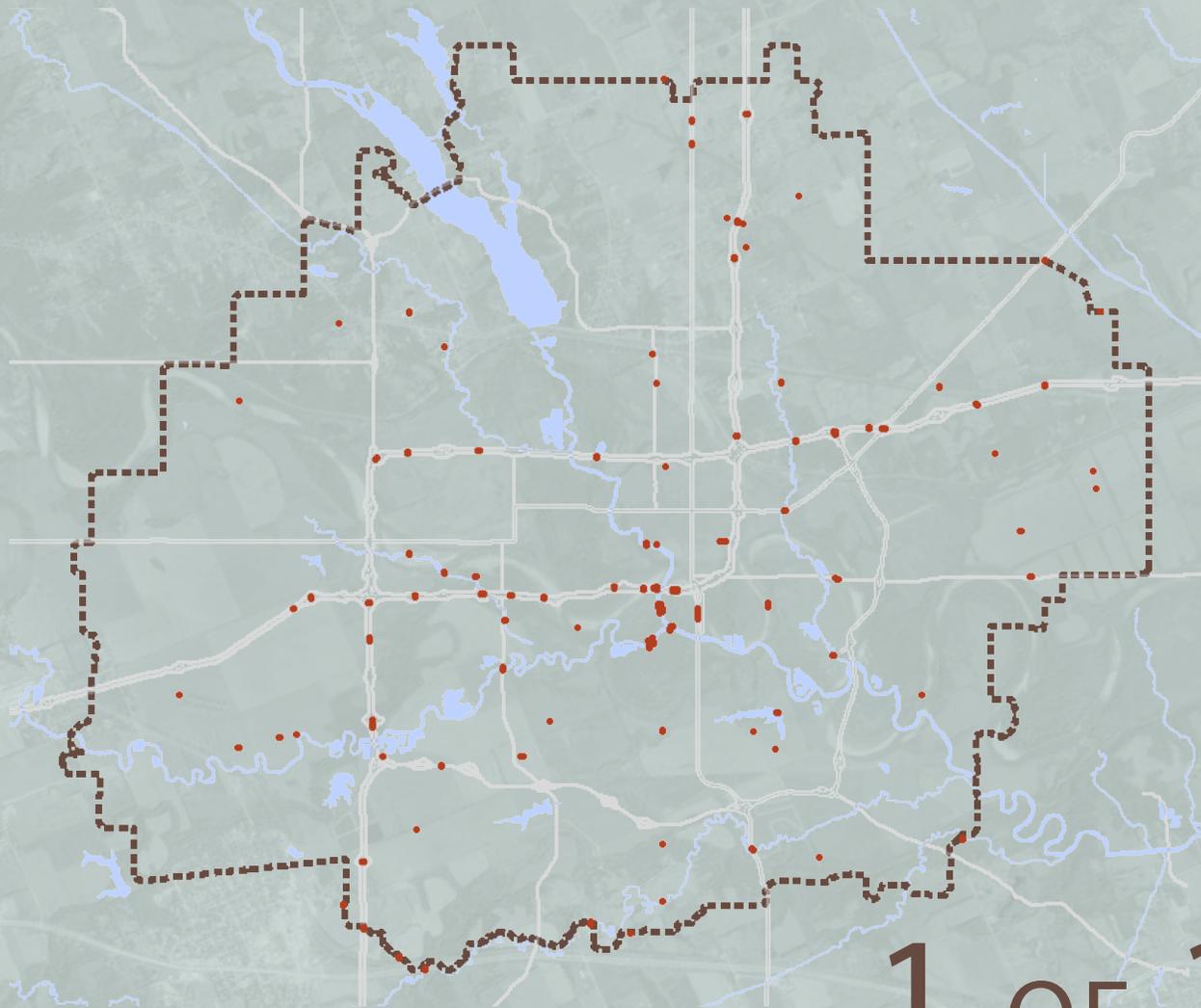


MPO AVERAGE: 82

Bridges are given a sufficiency rating as well as a structurally deficient or functionally obsolete classification. Sufficiency ratings indicate a bridge's sufficiency to stay in service and help determine which bridges may need repair or replacement. Structurally deficient refers to bridges needing significant maintenance, rehabilitation, or replacement, while functionally obsolete refers to bridges that no longer meet the criteria for the system of which the bridge is a part.

DID YOU KNOW?

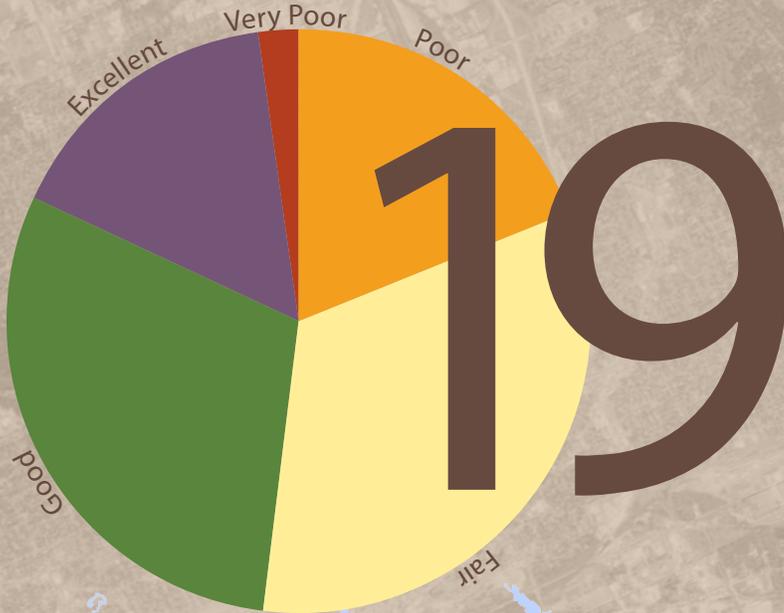
Only bridges categorized as structurally deficient or functionally obsolete with a sufficiency rating below 80 are eligible for certain federal funds. In 2012, 81 bridges in our region were eligible for this funding.



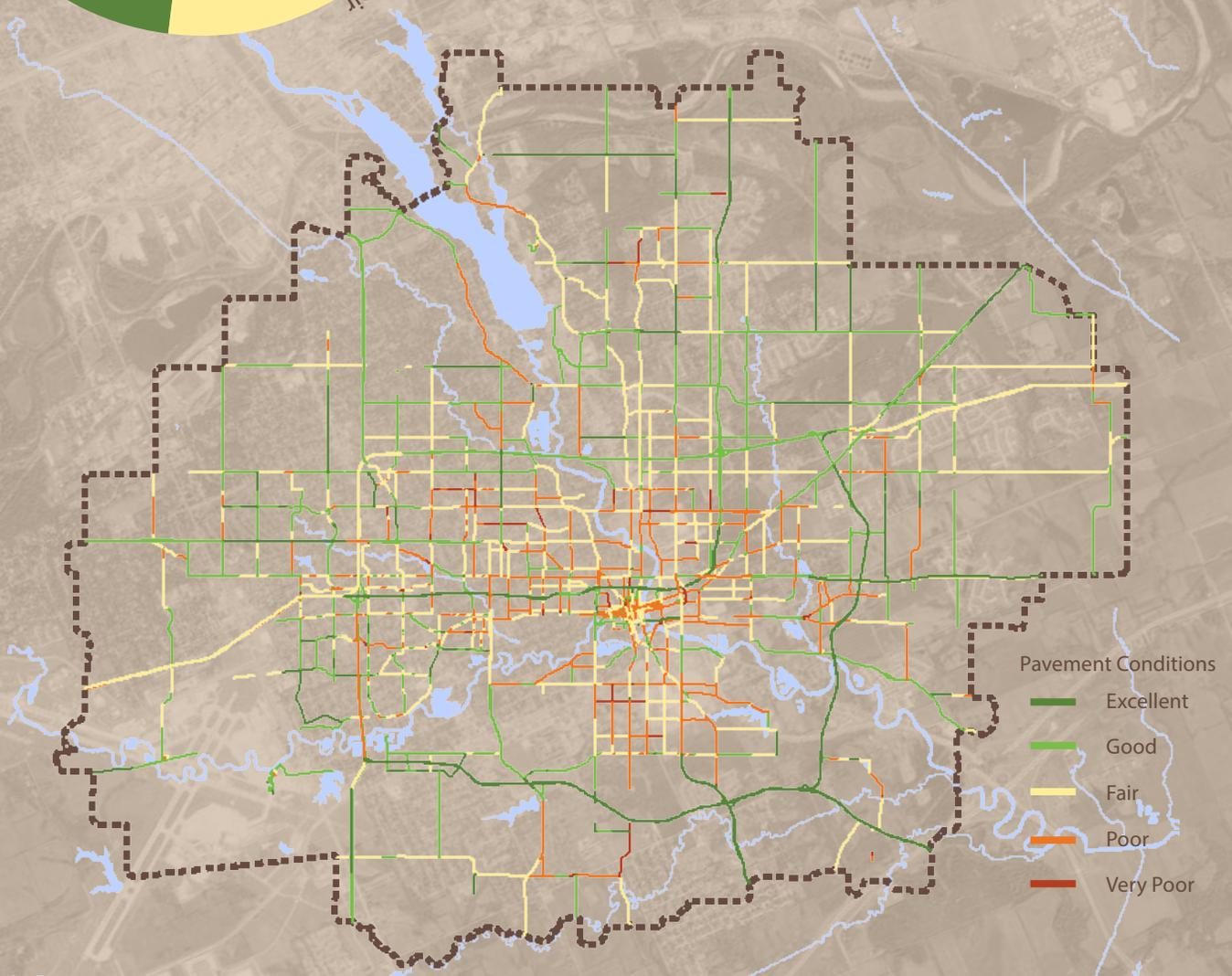
1 OF 3

AREA BRIDGES ARE ELIGIBLE
FOR FUNDING BASED UPON
THEIR CONDITION

STATE of the Roads



PERCENT OF OUR
ROADS ARE IN
EXCELLENT
CONDITION



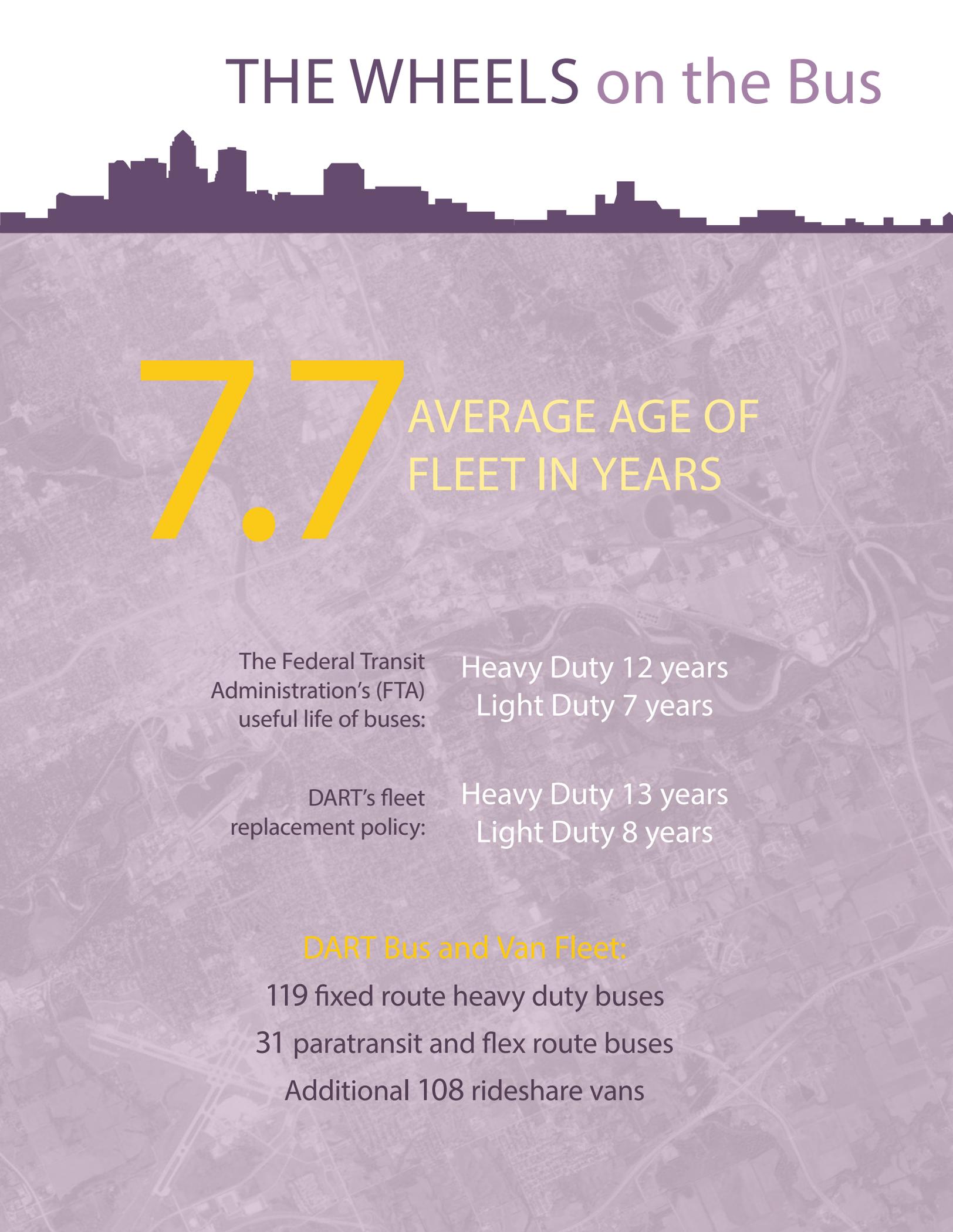
The Iowa Department of Transportation (DOT) and the Institute for Transportation at Iowa State University (InTrans) annually collect pavement condition data for roads across the state. This data includes the Pavement Condition Index (PCI), which tells us the level of quality we can expect when driving on the roadways. PCI scores range from 0 to 100, with 100 being the best possible score.

IT'S NOT JUST A QUESTION FOR WINTER: HOW ARE THE ROADS?



Using a scoring system of 0 to 100, the average road conditions for Greater Des Moines area communities range widely. The average for the entire region is 60; the state aims to maintain an average rating of 62.5 — good condition — for the entire state-owned network.

THE WHEELS on the Bus



7.7 AVERAGE AGE OF
FLEET IN YEARS

The Federal Transit
Administration's (FTA)
useful life of buses:

Heavy Duty 12 years
Light Duty 7 years

DART's fleet
replacement policy:

Heavy Duty 13 years
Light Duty 8 years

DART Bus and Van Fleet:

119 fixed route heavy duty buses

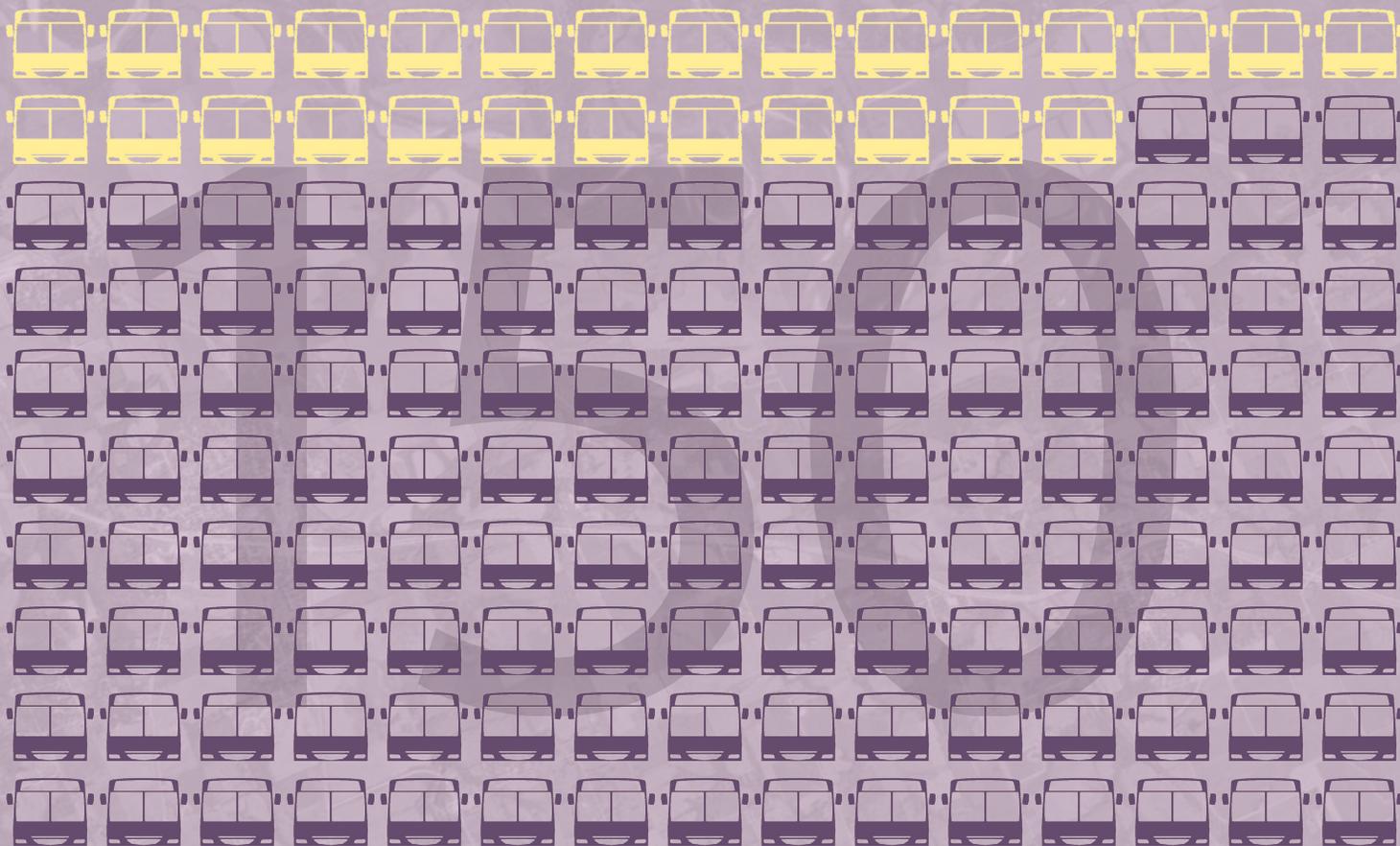
31 paratransit and flex route buses

Additional 108 rideshare vans

Maintenance is not limited to just roads and bridges. Considerable expense goes into maintaining and replacing transit infrastructure, particularly vehicles. The Federal Transit Administration and DART have policies that outlines the age at which transit vehicles should be replaced. A heavy-duty 40-foot bus costs \$450,000; hybrid fuel technology increases the cost by \$175,000. An articulated bus costs \$750,000, and a medium-duty bus costs \$156,000 (Source: DART).



18 PERCENT
OF DART BUSES
BEYOND THEIR
USEFUL LIFE



Targets

Greater Des Moines strives to maximize its previous investments to further the efficiency and effectiveness of the transportation system. To do so, the MPO has identified several targets for the region to work towards, as shown in the following table.

MEASURE	CURRENT	2050 TARGET
Bridge Sufficiency Rating		
Average Rating	82	-
Deficient Bridges [%]	25	Maintain
Transit		
Average Age of Fleet [Years]	7.7	6
Vehicles Beyond Useful Life [%]	18	0
Level of Service - Peak Hour		
Non-Congested Roads [% of Roadway Miles]	98.2	> 90
Freight Impediments		
Number of Impediments	16	0
Pavement Condition Index (PCI)		
Average PCI	60	-
Percent in Poor or Worse	18%	Maintain

Certain measures included in the chart do not have 2050 targets. These measures help give a clearer understanding of the current system without setting a goal for the future.

GOAL 3:

Improve the Region's Environmental Health

Creating and maintaining natural resource corridors, natural stormwater management systems, urban forest canopies, and parks embody the concept of natural stewardship. Good land stewardship ensures long-term environmental and economic health, and its effects improve the mental and physical well-being of people.

A green infrastructure network gives people access to nature, recreation, quiet, and views. Trees and other green infrastructure mitigate the negative environmental and economic impacts of natural disasters, climate change, and poorly designed developments. Ultimately, green systems make communities more resilient and help to attract people and employers. The transportation system can play a significant role in how Greater Des Moines residents experience the natural environment.

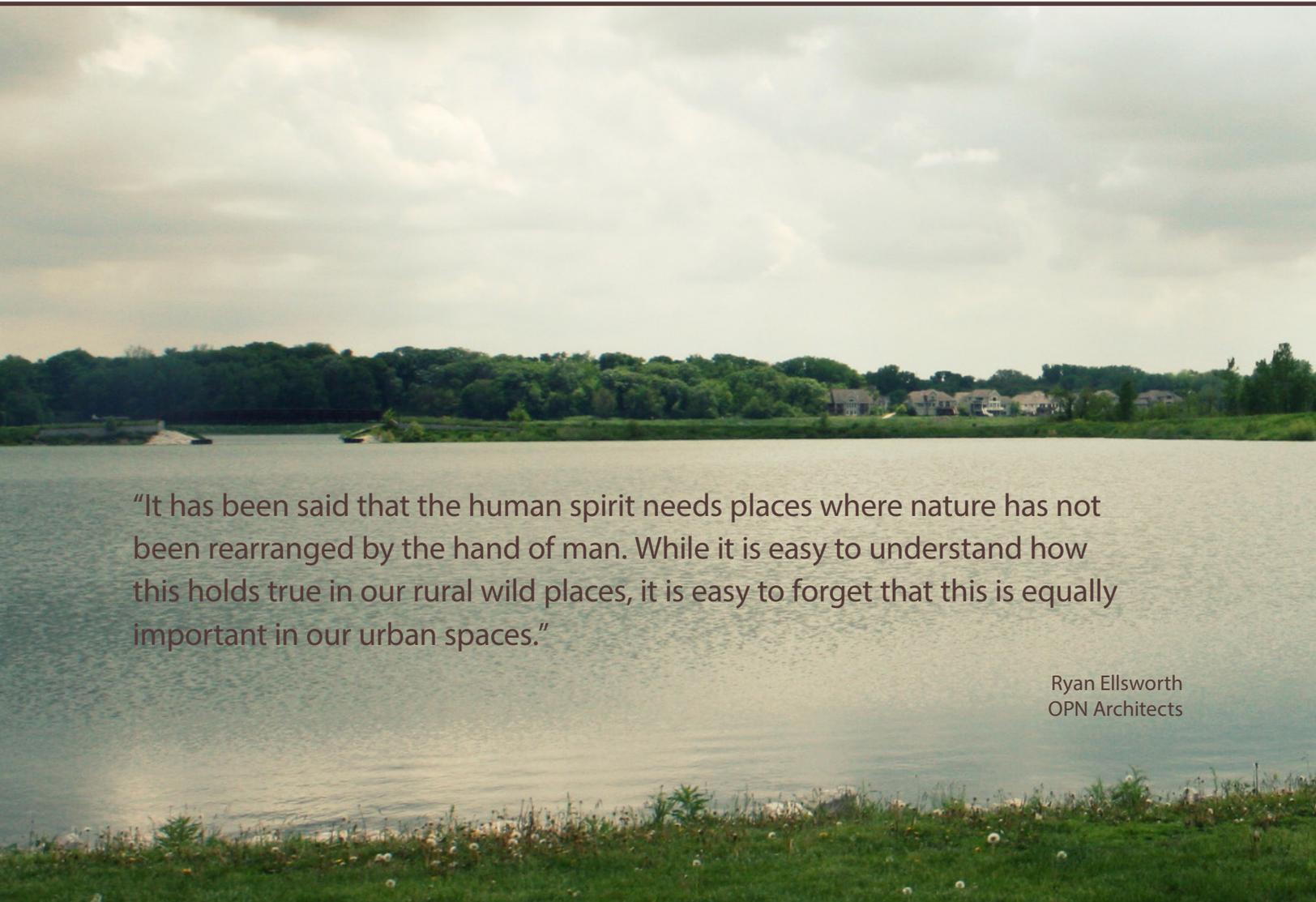
Current Conditions

One of the recurring themes during the MPO's various public outreach efforts was the desire of Greater Des Moines residents to get outside and enjoy the natural environment. People love riding on the trail system, hearing the birds, and disconnecting from the city. Despite this, the Greater Des Moines region has seen low levels of investment in open space over the last 40 years, with 88 percent of all current public interest land established before 1970, according to Polk County Conservation.

At the same time, Greater Des Moines is seeing a greater need to depend on the natural functions of watersheds to manage stormwater runoff and less on the gray infrastructure of storm sewers and detention ponds. Where conditions are created for infiltration strategies, using the natural functions of watersheds may save 10 to 50 percent on the cost of most stormwater infrastructure projects, according to the report *Banking on Green: A Look at How Green Infrastructure Can Save Municipalities and Provide Economic Benefits Community-Wide*.

With *Mobilizing Tomorrow*, the MPO is increasing its commitment to improving the region's environmental health as it invests in the transportation system. One of the first steps in this process is completing an inventory of environmentally sensitive areas — areas the MPO calls environmental conflict and environmental challenge areas. Many of these areas are coming under pressure as Greater Des Moines continues to grow outward. As a result, the region faces the possibility of losing key natural areas that not only provide habitat for plants and animals but also recreational opportunities for area residents. As this occurs and more roadways are proposed, the region must weigh the costs and benefits of development in regard to the natural environment.

Currently, Greater Des Moines has 77,106 acres of environmental challenge areas — those locations where proposed roadway improvements would potentially cost more to implement as a result of environmental features. Similarly, the region has 45,847 acres of environmental conflict areas — those locations where proposed improvements would pose a potential threat to the environment.



“It has been said that the human spirit needs places where nature has not been rearranged by the hand of man. While it is easy to understand how this holds true in our rural wild places, it is easy to forget that this is equally important in our urban spaces.”

Ryan Ellsworth
OPN Architects

Measures

The MPO has pinpointed four measures to assess how well Greater Des Moines, as a region, is protecting its environmental health. The first two relate to environmental impacts, while the remaining measures related to Vehicle Miles Traveled (VMTs).

When looking at environmental impacts, the MPO looks at two different areas. Environmental challenge areas are those locales where proposed improvements would potentially cost more to implement as a result of environmental features. Environmental conflict areas are those locales where proposed improvements would pose a potential threat to the environment.

VMTs measure the amount of total miles driven by all vehicles in a given area and are an indicator of how much people are driving. VMT-based metrics, such as per capita VMT and crashes per VMT, are common performance measures in transportation planning. Mobilizing Tomorrow supports a reduction in VMTs to reduce energy consumption, transportation-related emissions, congestion, and the occurrence of crashes.

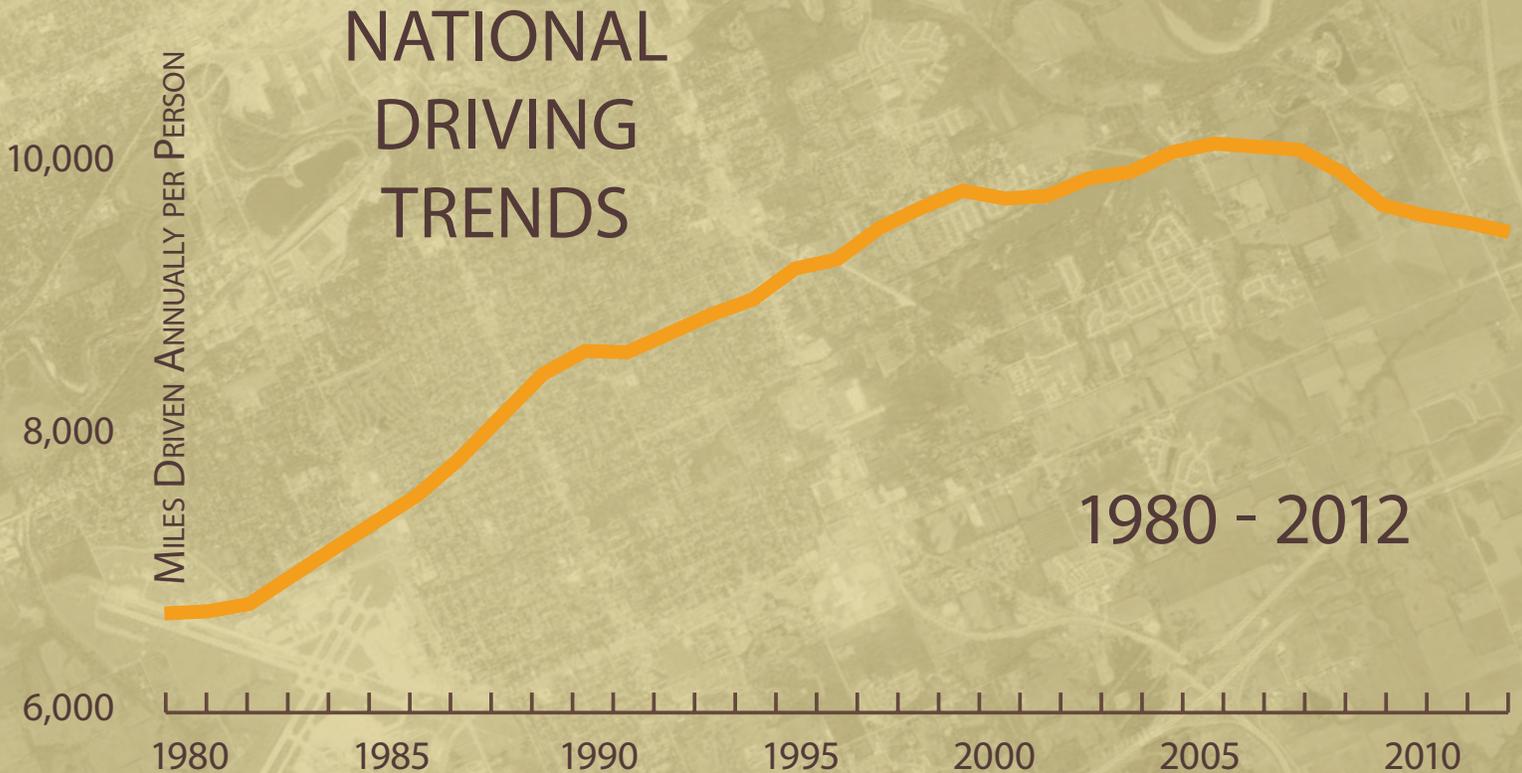


MANY the Miles

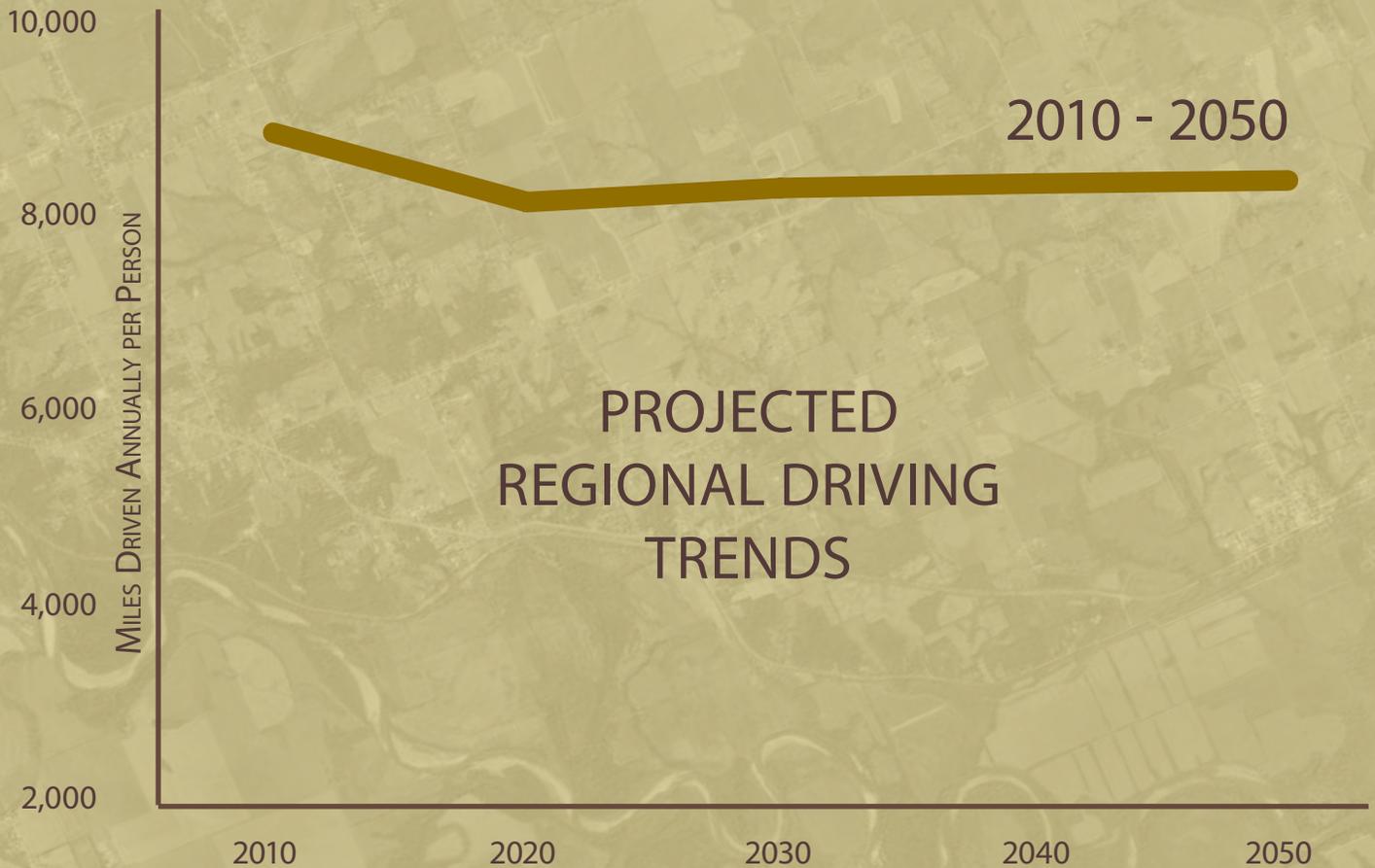
Nationally, the number of miles driven peaked in 2004. Since then, VMTs have been declining; the 2012 levels equaled those seen in 1997.

Demographic changes — namely aging Baby Boomers and fewer Millennials seeking drivers licenses — are contributing to less driving.

Local trends follow national trends when it comes to how much the region is driving. Collectively, MPO cities and counties have seen a decline in the number of miles driven per capita since 2000.



Vehicle miles traveled (VMTs) are the amount of total miles driven by all vehicles in a given area and are an indicator of how much people are driving. VMT-based metrics, such as per capita VMT and crashes per VMT, are common performance measures in transportation planning. Mobilizing Tomorrow and other efforts support a reduction in VMTs to reduce energy consumption, transportation-related emissions, congestion, and the occurrence of crashes.



CAN WE CONTINUE TO REDUCE
HOW MANY MILES WE'RE DRIVING?

Many strategies exist to reduce the number of miles people are driving:

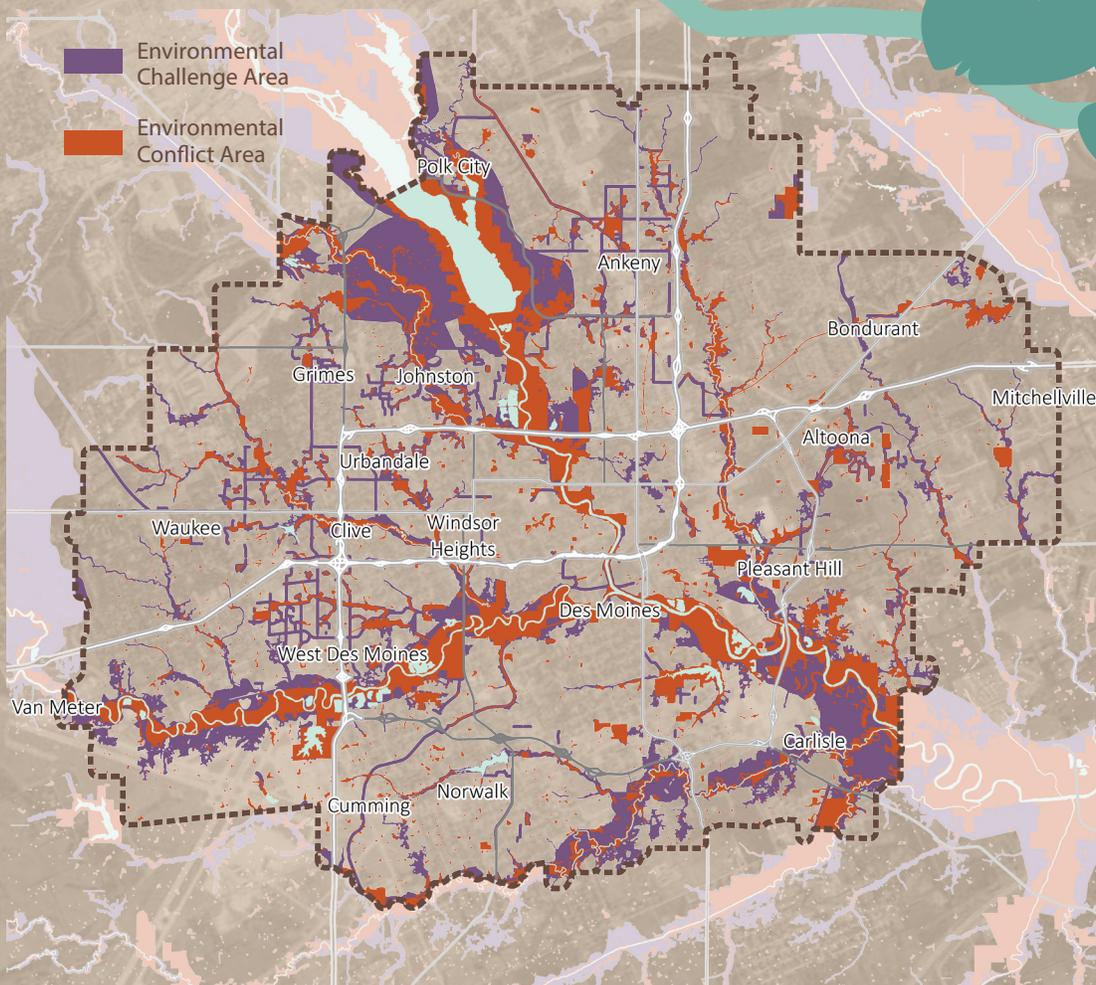
- Creating more mixed use, walkable developments
- Increasing the availability of alternative modes of transportation, such as public transit and bicycling
- Increasing the cost of driving

PRESERVING the Environment

As development continues to occur around the region's periphery, we must consider environmental conflict and environmental challenge areas.

ENVIRONMENTAL CHALLENGE AREA n 1 a location where proposed improvements would potentially cost more to implement as a result of environmental features

Wetlands, Floodways, Floodplains, and Hydric Soils



Existing natural resources, their conditions, and their protection status are foundational in shaping the region's quality of life. Time and again, Greater Des Moines residents have demonstrated their desire to recreate outdoors and to simply enjoy nature. However, many environmentally sensitive areas are coming under pressure as our region continues to grow outward. As this occurs, we must be cognizant of these areas and weigh the costs and benefits of all proposed projects in regard to the natural environment.

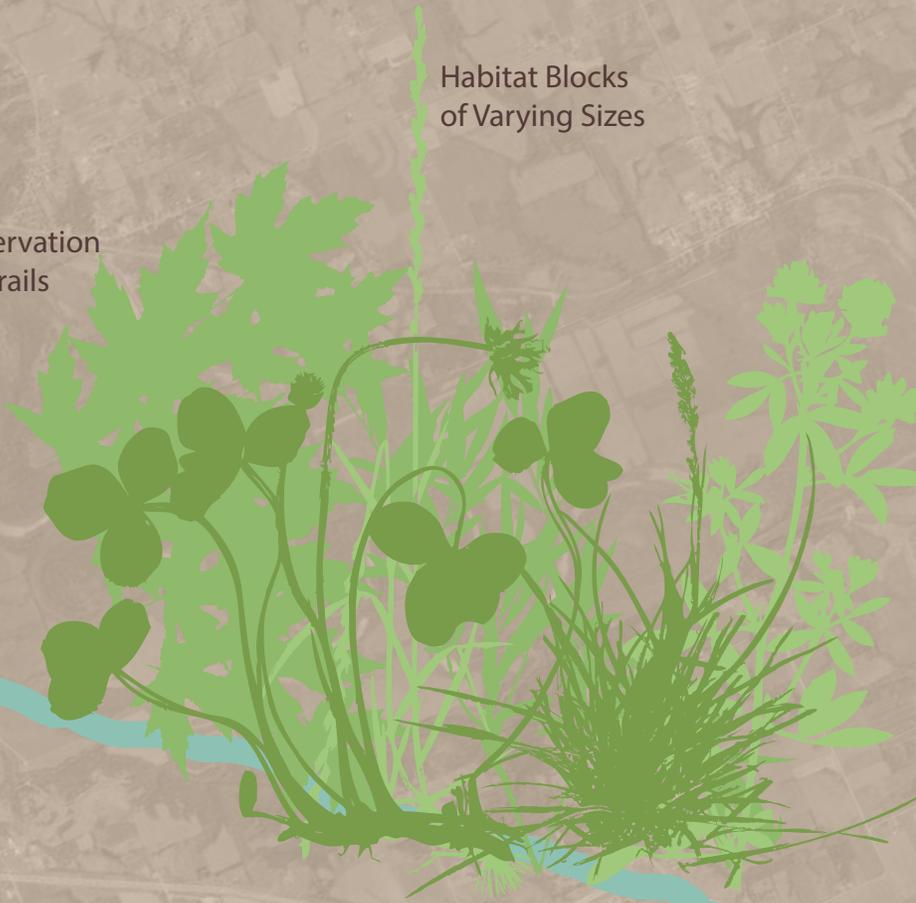
ENVIRONMENTAL CONFLICT AREA n 1 a location where proposed improvements would pose a potential threat to the environment



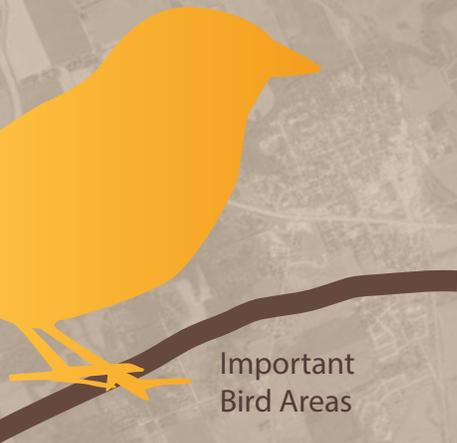
Prairie Potholes

Parks, conservation areas, and trails

Habitat Blocks of Varying Sizes



Water Trails + Streams



Important Bird Areas

86,000
ACRES OF ENVIRONMENTAL
CHALLENGE + CONFLICT AREAS

Targets

As a region, Greater Des Moines has demonstrated its commitment to preserving and protecting the natural environment. It is not enough to maintain the status quo; Greater Des Moines residents have expressed their desire for a more proactive approach.

MEASURE	CURRENT	2050 TARGET
Environmental Impacts		
Environmental Conflicts Areas [Acres]	45,847	Do Not Disturb
Environmental Challenge Areas [Acres]	77,106	Mitigate What Is Disturbed
Vehicles Miles Traveled		
Total [Average Weekday]	11,591,234	Decrease
Per Capita [Average Weekday]	24.14	Decrease

GOAL 4:

Further the Health, Safety, and Well-Being of All Residents in the Region

One of Greater Des Moines's key competitive advantages is its high quality of life. The region is consistently recognized for its affordability, access to the outdoors, and family-friendly atmosphere. However, this way of life is being challenged by impediments to multiple systems, including the area's car-centered transportation system and decreasing levels of physical activity. For residents to be able to truly enjoy the high quality of life for which Greater Des Moines is known, health and well-being, in all senses of those terms, need to be actively promoted throughout the region.

Current Conditions

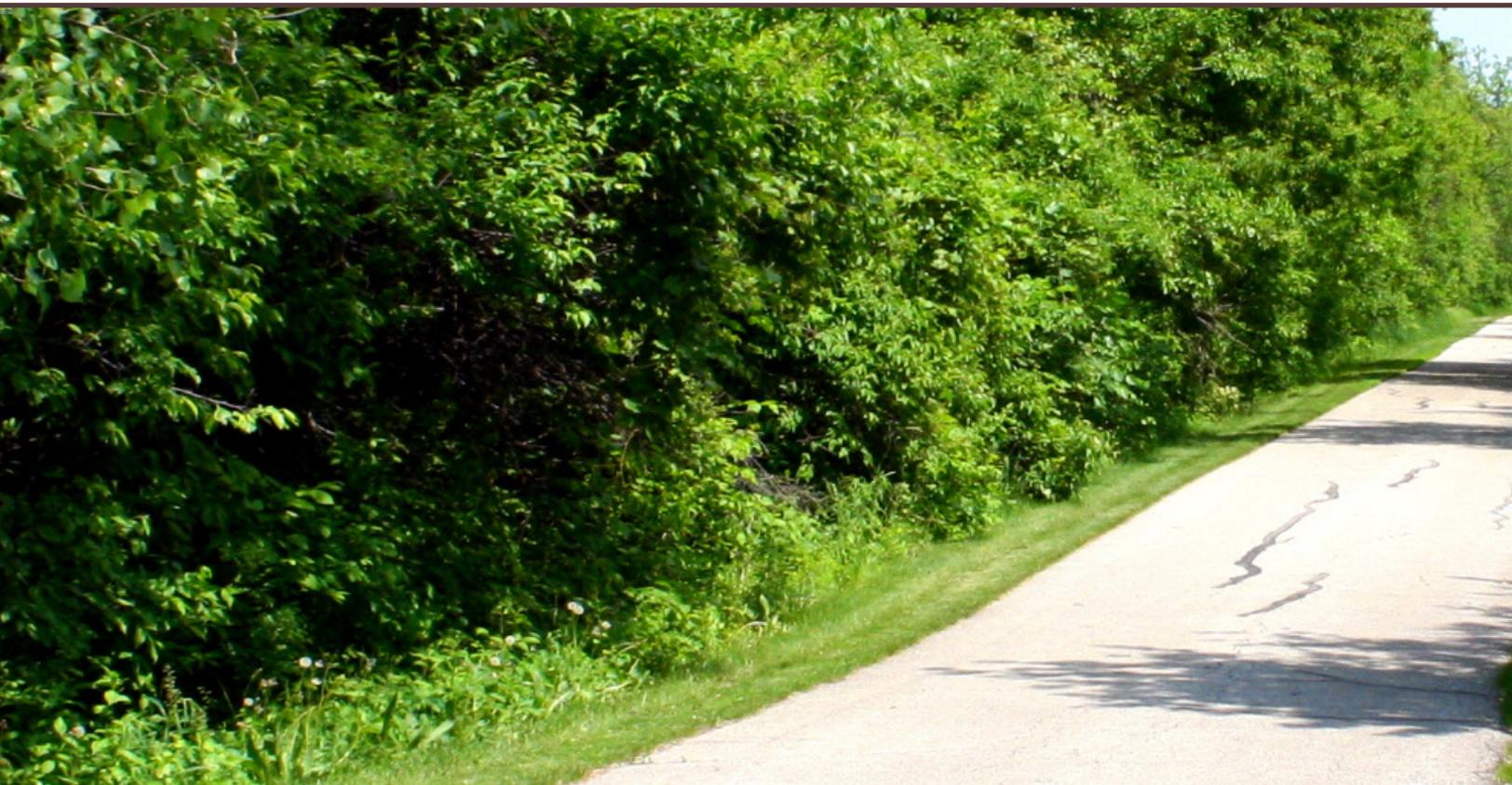
Improving the health, safety, and well-being of all residents in Greater Des Moines furthers the vision of the region as one of lasting value, equity, and diversity. The way in which Greater Des Moines residents live influences their health, from the safety in one's automobile to access to key services.

Mobilizing Tomorrow encourages the development of diverse transportation options, increased access, and equality for all in the region. Three key pieces the region needs to understand in order to reach this goal are roadway safety, gaps in the regional trail system, and environmental justice.

Evaluating the safety levels of Greater Des Moines roadways enables the region to identify crash trends and to implement safety countermeasures. While fatality and major injury rates generally have decreased over the last several years, Greater Des Moines still can improve. After all, even one fatality is too many.

Residents' health and well-being can be enhanced by spending time outdoors and exercising. While Greater Des Moines touts its regional trail system and calls itself the 'Trails Capital of the World,' the region still has several significant gaps in its trail system. Though the existing network enables cyclists to travel many places, completing trails in these gaps could further enhance the already strong cycling community in Greater Des Moines.

The third facet of improving the health, safety, and well-being in the region is environmental justice. An environmental justice area is an area with a large population of traditionally under served individuals. The MPO works to ensure the fair treatment and meaningful involvement of all resident in the region, including those living in these areas. This means that no group should bear a disproportionate share of negative health or environmental consequences from any project. The MPO studies seven Degrees of Disadvantage to identify these areas. They include linguistically isolated, non-white populations, persons in poverty, carless households, single heads of households with children, persons over 65, and persons with disabilities. The MPO identifies those areas with high concentrations in six of these groups as environmental justice areas. While these areas only occupy four percent of the land area in Greater Des Moines, fifteen percent of local residents live in these areas.



Measures

The MPO has identified several data points that can help the region understand its progress in furthering the health, safety, and well-being of all residents in the region. These fall into three primary categories: Crash data, regional trail gaps, and environmental justice areas.

Crash data analysis offers insights into current trends and lets the region understand the safety of its roadways. This often allows the region to glean new understandings of trouble areas as well. When considering crash data, specific measures include:

- Number of fatalities;
- Fatalities per 100 million vehicle miles traveled;
- Number of serious injuries; and,
- Serious injuries per 100 million vehicle miles traveled.

When considering regional trail gaps, Greater Des Moines looks at both the number of gaps in the trail system as well as the length, in miles, of the gaps. This information allows the MPO to make strategic investments in the trail system to further its connectivity.

Finally, the MPO considers a number of measures when analyzing environmental justice areas. Doing so enables the MPO to consider the impact — both positive and negative — of potential projects in these areas. These include:

- Percent of population;
- Percent of area;
- Pavement conditions;
- Bridge conditions;
- The crash data outlined above; and,
- Non-congested roads.

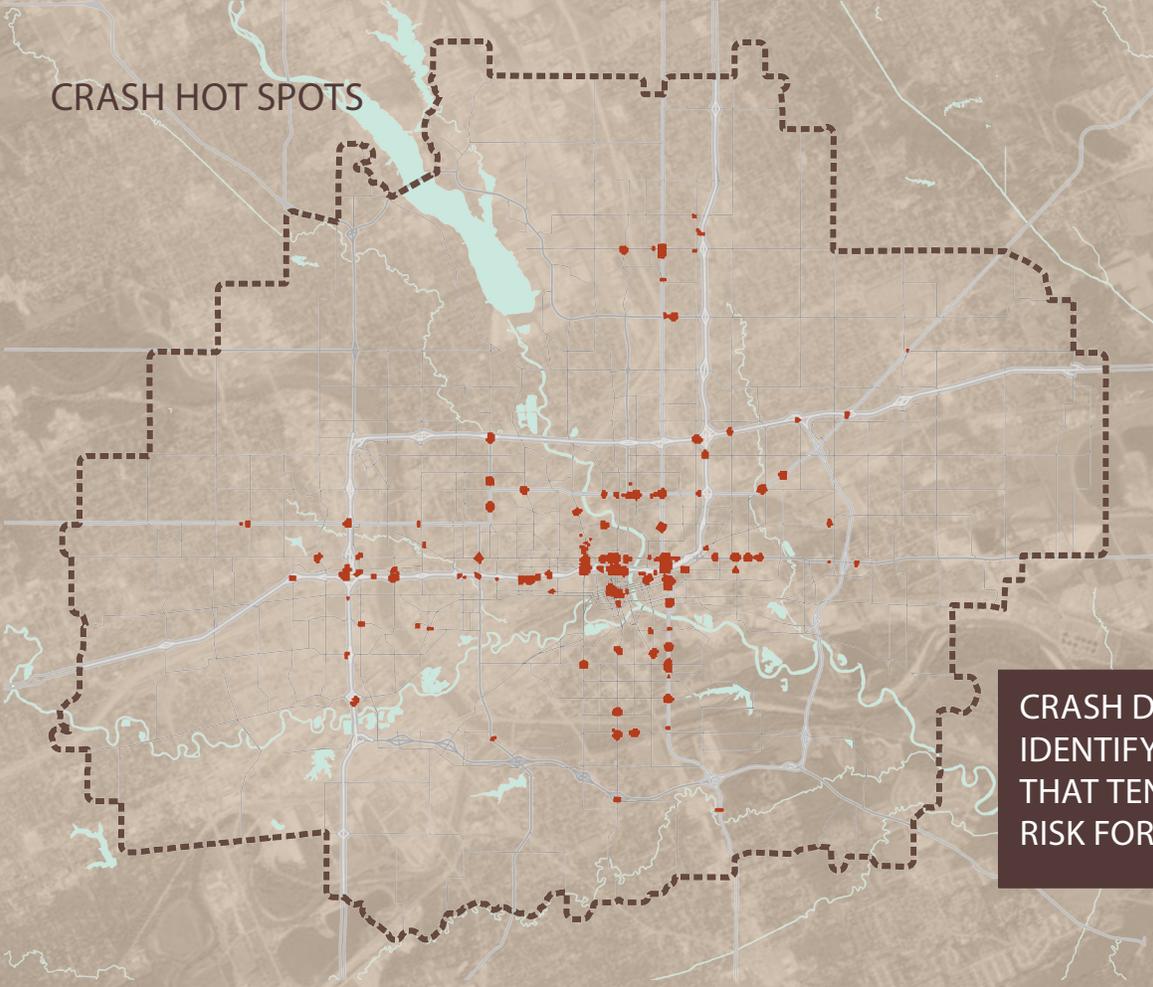


“We believe in capitalizing on sustainability practices so that Iowa can continue to boast a strong economy and a high quality of life, now and for future generations.”

Fred Hubbell and Bob Riley
Capital Crossroads Natural Capital Committee Co-Chairs

METRO Mishaps

CRASH HOT SPOTS

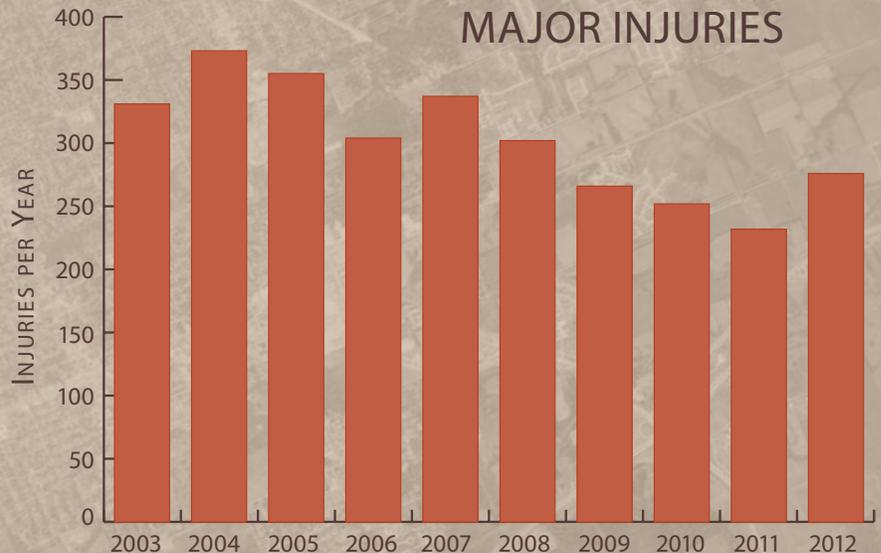


CRASH DATA CAN HELP IDENTIFY ROADWAY TYPES THAT TEND TO BE MOST AT RISK FOR CRASHES.

TRENDS

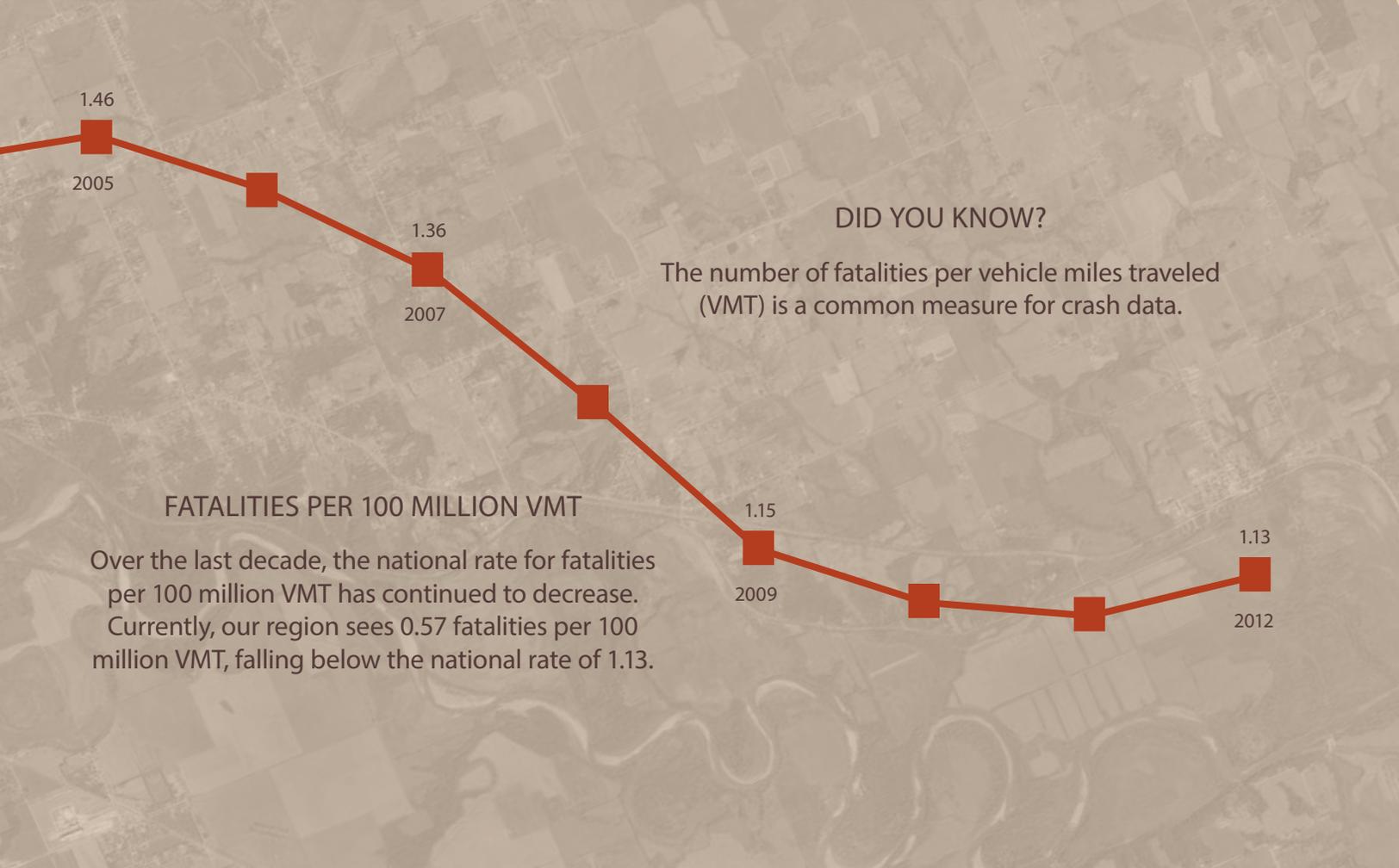
Over the last decade, the region has seen a decrease in both major injuries and fatalities as a result of automobile crashes in Dallas, Madison, Polk, and Warren counties. The total number of major injuries peaked in 2004 with 373; since then, the region has had an average of 291 major injuries annually as a result of automobile accidents.

MAJOR INJURIES



Data Source:
2012 Iowa DOT Crash Data

By analyzing crash data, the MPO is able to help identify the roadway types that tend to be most at risk for crashes. Using the Iowa Department of Transportation's Crash Mapping Analysis Tool (CMAT), the MPO pinpoints problem streets with higher crash densities and with more severe crashes.



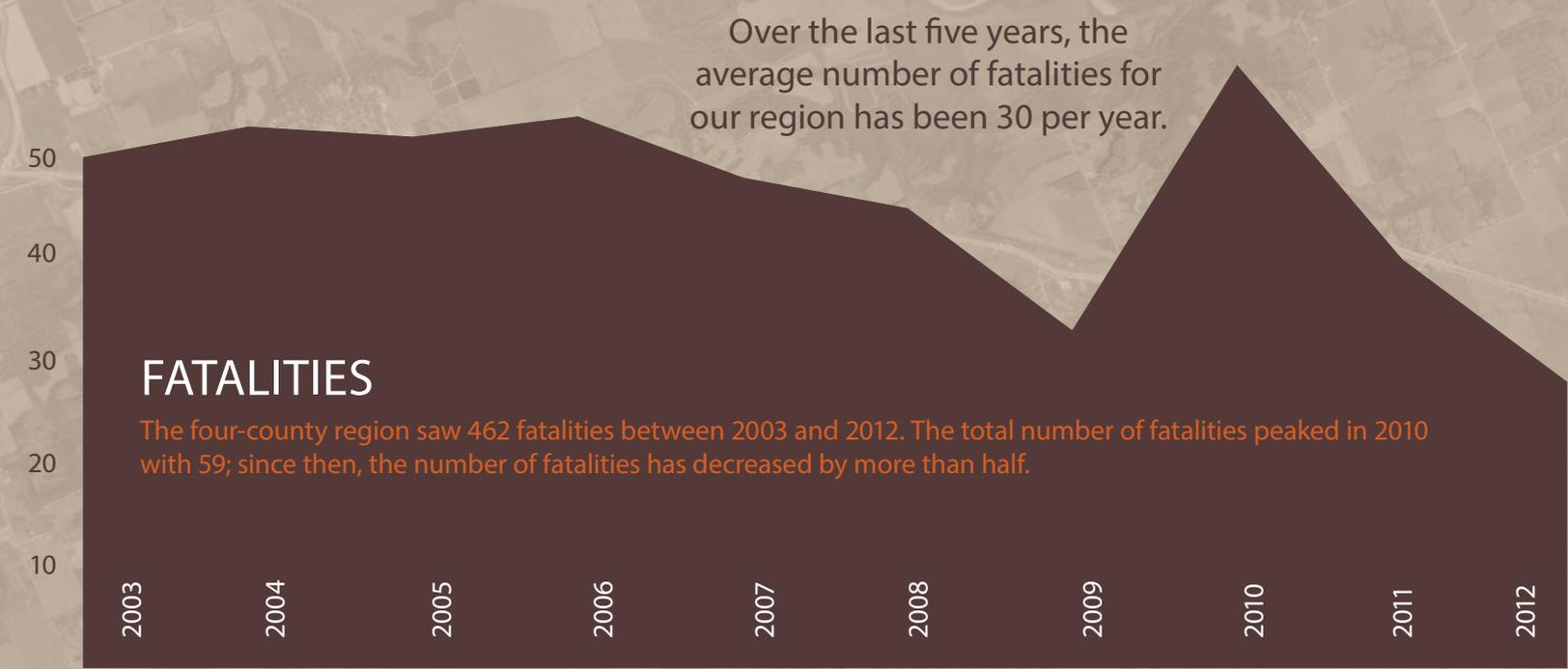
DID YOU KNOW?

The number of fatalities per vehicle miles traveled (VMT) is a common measure for crash data.

FATALITIES PER 100 MILLION VMT

Over the last decade, the national rate for fatalities per 100 million VMT has continued to decrease. Currently, our region sees 0.57 fatalities per 100 million VMT, falling below the national rate of 1.13.

Over the last five years, the average number of fatalities for our region has been 30 per year.



FATALITIES

The four-county region saw 462 fatalities between 2003 and 2012. The total number of fatalities peaked in 2010 with 59; since then, the number of fatalities has decreased by more than half.

FOLLOW the Trail

TRAIL COUNTERS CAN HELP US ANSWER THE QUESTION
WHERE ARE FUTURE TRAIL INVESTMENTS NEEDED?

40

PERCENT
OF RIDES
OCCUR ON
WEEKENDS

Central Iowans ride the most between 10:00 am and 4:00



Data Source:
Central Iowa Trail Count Program

In October 2011, the MPO began the Central Iowa Trail Counter Program with 40 infrared trail counters to provide a consistent method for collecting trail user data across the region. As of August 2014, 49 different locations had been counted. The data is used to analyze changes in trail usage as well as to help the MPO understand where future trail investments may be needed.

OUR TRAILS + TRAIL COUNTERS COVER THE REGION



THE TOP TRAILS OF 2012

These trails averaged the most riders on a daily basis in 2012.

- 01 High Trestle Bridge (East Side)
- 02 North Walnut Creek (Urbandale)
- 03 High Trestle Trail (Slater)
- 04 Walnut Creek Trail (Interstate 235)
- 05 Lakeview Park Trail (Urbandale)

JUNE 2012: 48,147 RIDERS

TRAIL
USAGE IS
ON THE RISE

JUNE 2013: 71,888 RIDERS

EQUAL Opportunity

7 FOCUS AREAS

Linguistically isolated • Non-white population • Persons in poverty • Carless households • Single heads of households with children • Persons over 65 • Persons with a disability

40 | 16

PERCENT OF ROADS IN DISADVANTAGED AREAS ARE IN POOR OR WORSE CONDITION

PERCENT OF ROADS IN NON-DISADVANTAGED AREAS ARE IN SUCH CONDITION

Environmental Justice Area

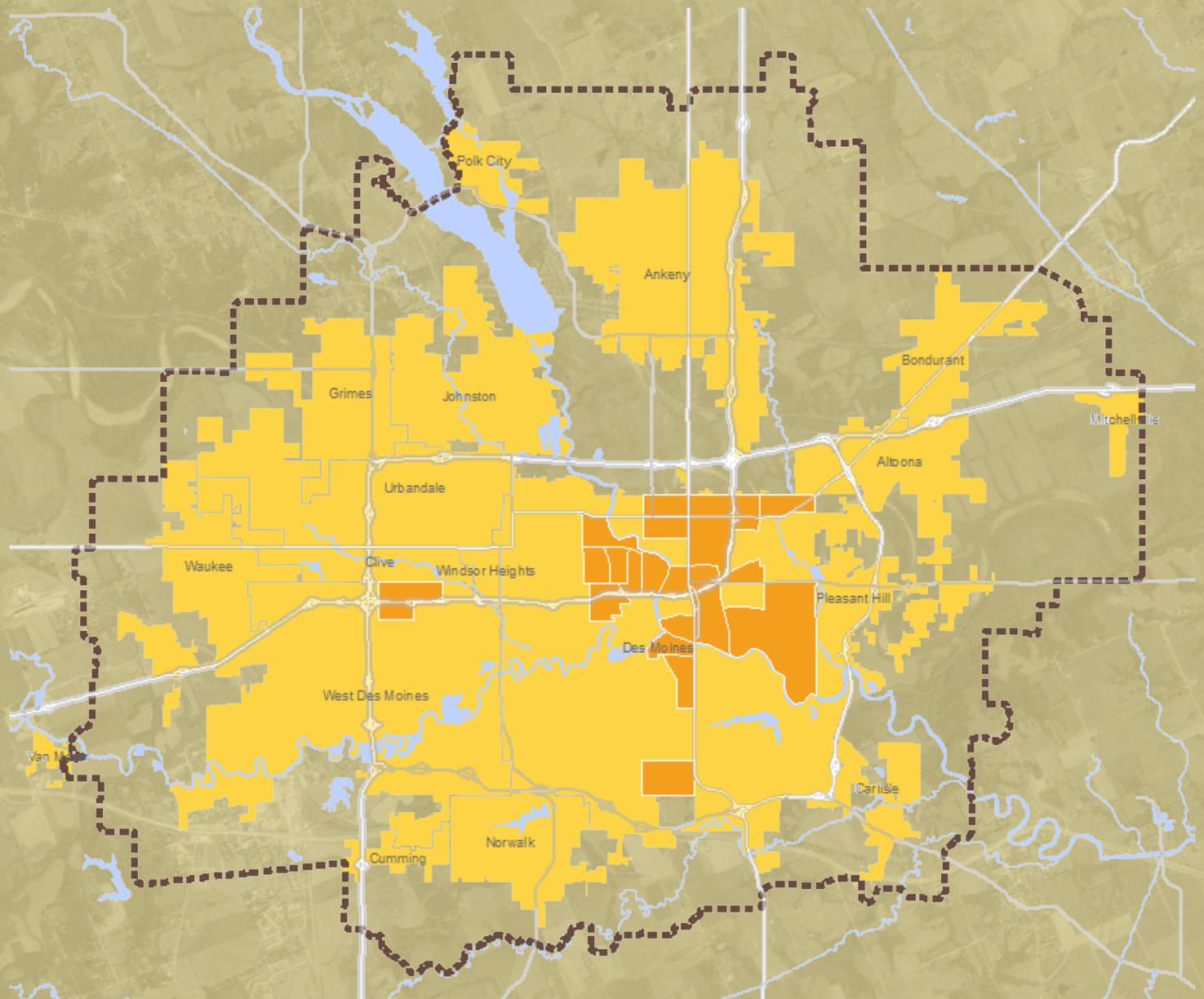
Non-Environmental Justice Area

ENVIRONMENTAL JUSTICE AREA n 1 a locale in Greater Des Moines that has high concentrations of at least 6 of the focus areas listed above

SERIOUS INJURIES FROM AUTO CRASHES

The MPO works to ensure the fair treatment and meaningful involvement of all residents in the region. This means that no group, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of negative health or environmental consequences of any project. To ensure fair treatment, the MPO studies seven Degrees of Disadvantage to identify environmental justice areas, or those areas with large populations of traditionally under served individuals.

15% of area residents live in environmental justice areas



YET THESE AREAS COVER ONLY **4%** of the land area

Targets

Regional leaders continually seek to make the region an even better place to live, work, learn, and play. Furthering the health, safety, and well-being of all residents in the region only will serve to make the region more appealing for current and potential residents as well as businesses. The MPO has identified several targets for the region to work towards.

MEASURE	CURRENT	2050 TARGET	
Crash Data			
Number of Fatalities [5-Year Average]	30	Decrease	
Fatalities per 100 Million VMT	0.71	Decrease	
Number of Serious Injuries [5-Year Average]	215	Decrease	
Serious Injuries per 100 Millions VMT	5.08	Decrease	
Regional Trail Gaps			
Number of Gaps	13	0	
Miles of Gaps	54	0	
Environmental Justice Areas			
	EJ Areas	Non-EJ Areas	
Percent of Population	15	85	-
Percent of Area	4	96	-
Pavement Condition			
Average Pavement Condition Index	50	61	EJ = Non-EJ
Pavement Condition Index [% Poor or Worse]	40	16	EJ = Non-EJ
Bridge Condition			
Average Rating	87	81	-
Deficient Bridges [%]	1	23	-
Crash			
Number of Fatalities [5-Year Average]	5	25	-
Fatalities per 100 Million VMT	0.99	0.67	EJ = Non-EJ
Number of Serious Injuries [5-Year Average]	54	156	-
Serious Injuries per 100 Millions VMT	10.74	4.18	EJ = Non-EJ
Non-Congested Roads [% of Roadway Miles]	95	98	> 90

Certain measures included in the chart do not have 2050 targets. These measures help give a clearer understanding of the current system without setting a goal for the future.

PERFORMANCE MEASURES

Performance measures are quantitative descriptions that help us understand how the transportation system is performing. The MPO has developed a number of performance measures to track how well the region is meeting the goals laid out in Mobilizing Tomorrow, as shown in the preceding sections. This section offers an overview of these performance measures as well as a look at how certain performance measures compare in environmental justice and non-environmental justice areas across Greater Des Moines.

The MPO will track performance measures annually to gauge progress towards the target. As new information becomes available, the MPO may adjust targets and/or add new performance measures for the region to track.

Performance measures also were considered in the development of criteria for evaluating projects considered for inclusion in Mobilizing Tomorrow.

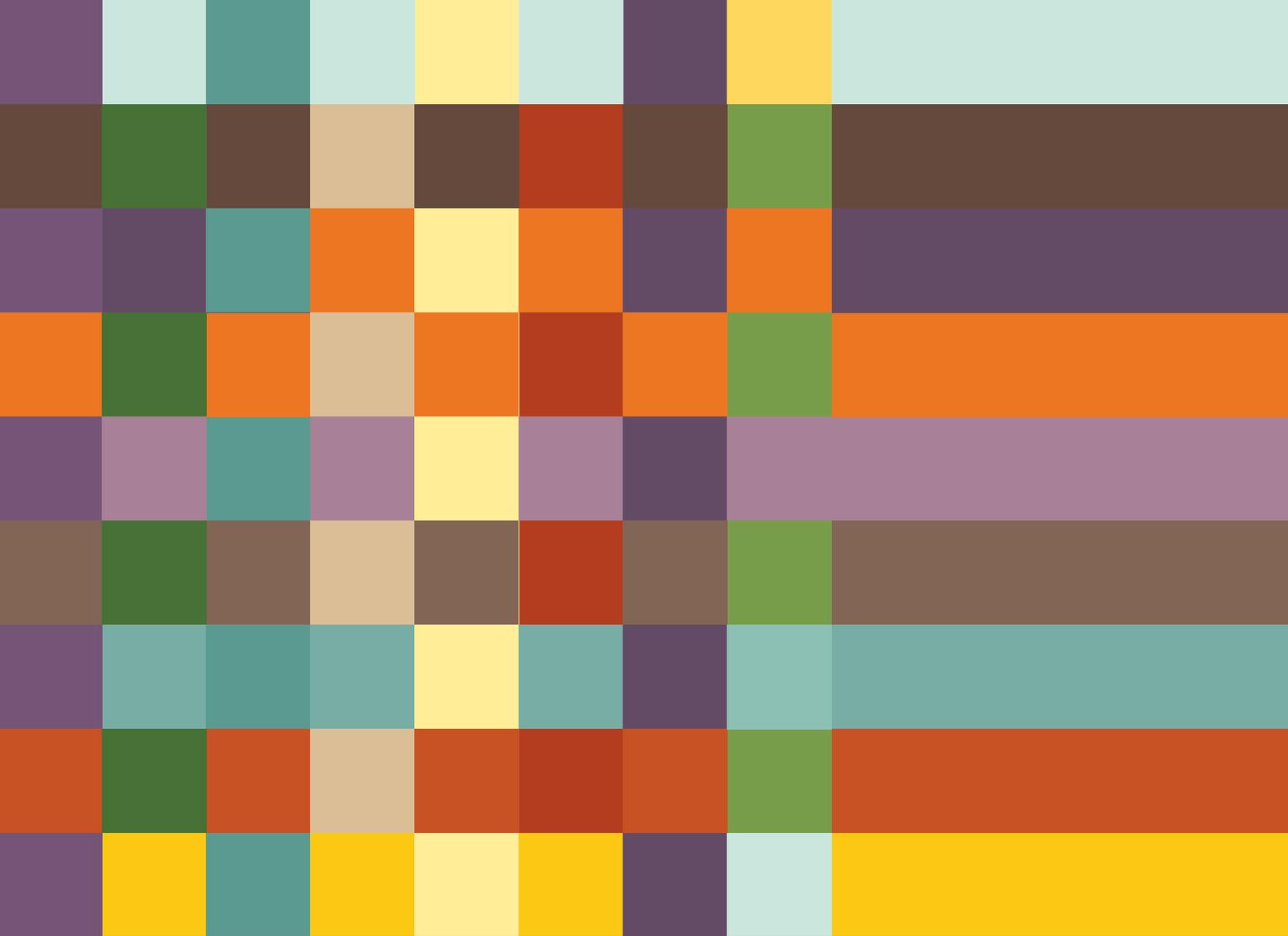
PERFORMANCE MEASURES

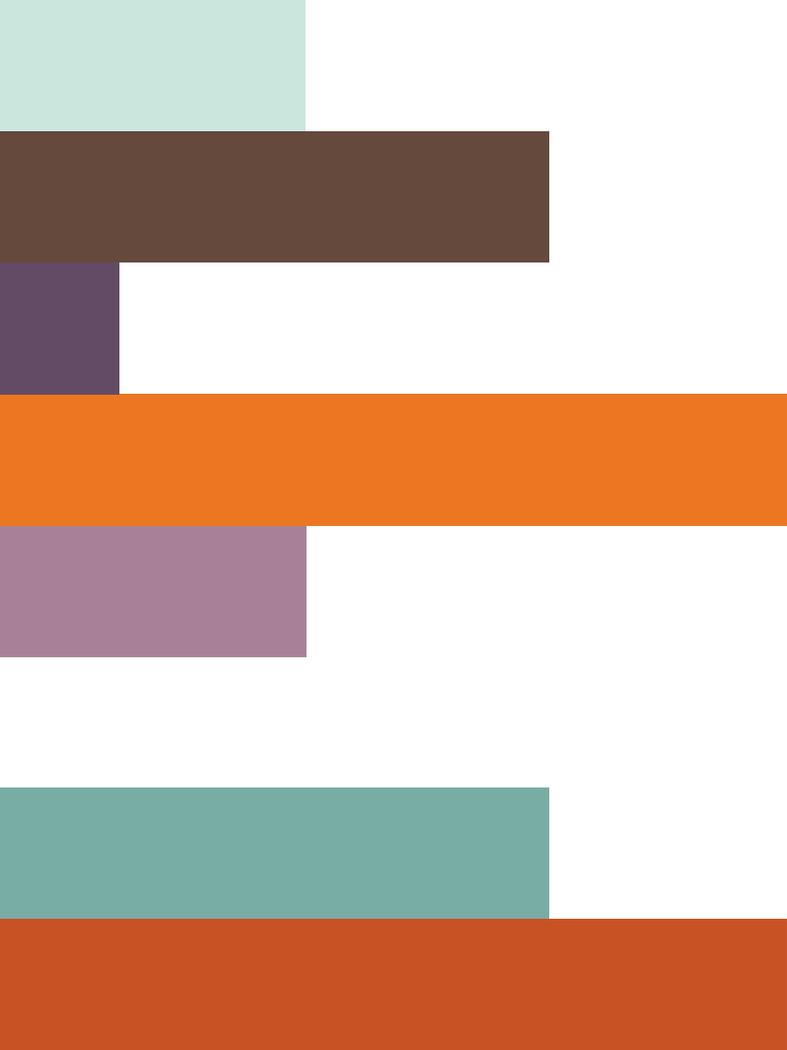
MEASURE	CURRENT	2050 TARGET
Goal 1: Enhance Multimodal Transportation Options		
Bicycle System On-Street		
Miles of On-Street Facilities	23	400
Mode Choice/Split (Peak Hour Trips to Downtown) [%]		
Single Occupancy Vehicles	77	55
Transit	7	20
Carpool	12	15
Walk/Bike/Work from Home/Other	4	10
Transit		
Total Ridership (Fiscal Year 2014)	4,400,000	8,800,000
Goal 2: Manage and Optimize Transportation Infrastructure and Services		
Bridge Sufficiency Rating		
Average Rating	82	-
Deficient Bridges [%]	25	Maintain
Transit		
Average Age of Fleet [Years]	7.7	6
Vehicles Beyond Useful Life [%]	18	0
Level of Service - Peak Hour		
Non-Congested Roads [% of Roadway Miles]	98.2	> 90
Pavement Condition Index		
Average Pavement Condition Index	60	-
Percent in Poor or Worse Condition	18	Maintain
Freight Impediments		
Number of Impediments	10	0
Goal 3: Improve the Region's Environmental Health		
Environmental Impacts		
Environmental Conflicts Areas [Acres]	45,847	Do Not Disturb
Environmental Challenge Areas [Acres]	77,106	Mitigate What Is Disturbed
Vehicles Miles Traveled		
Total [Average Weekday]	11,591,234	-
Per Capita [Average Weekday]	24.14	Decrease
Goal 4: Further the Health, Safety, and Well-Being of All Residents in the Region		
Crash Data		
Number of Fatalities [5-Year Average]	30	Decrease
Fatalities per 100 Million VMT	0.71	Decrease
Number of Serious Injuries [5-Year Average]	215	Decrease
Serious Injuries per 100 Millions VMT	5.08	Decrease
Regional Trail Gaps		
Number of Gaps	13	0
Miles of Gaps	54	0

PERFORMANCE MEASURES: ENVIRONMENTAL JUSTICE AREAS

MEASURE	CURRENT		2050 TARGET
	Environmental Justice Areas	Non-Environmental Justice Areas	
Percent of Population	15	85	-
Percent of Area	4	96	-
Pavement Condition			
Average Pavement Condition Index	50	61	EJ = Non-EJ
Pavement Condition Index [% Poor or Worse]	40	16	EJ = Non-EJ
Bridge Condition			
Average Rating	87	81	-
Deficient Bridges [%]	1	23	-
Crash			
Number of Fatalities [5-Year Average]	5	25	-
Fatalities per 100 Million VMT	0.99	0.67	EJ = Non-EJ
Number of Serious Injuries [5-Year Average]	54	156	-
Serious Injuries per 100 Millions VMT	10.74	4.18	EJ = Non-EJ
Non-Congested Roads [% of Roadway Miles]	95	98	> 90

Certain measures included in the chart do not have 2050 targets. These measures help give a clearer understanding of the current system without setting a goal for the future.





3



INVESTMENT STRATEGIES

INVESTMENT STRATEGIES

A key role of Mobilizing Tomorrow is to outline a strategy for how the region will invest in transportation infrastructure over the next 35 years. This chapter sets a vision for maintaining and improving the transportation system for the Greater Des Moines region through 2050. The following sections identify revenue reasonably anticipated through 2050, reviews potential risks to this funding, and summarizes potential investment strategies proposed for the region.

Funding Our Future

Federal regulations require long-range transportation plans to be fiscally constrained. This means that the total transportation expenditures identified in the plan must not exceed the total revenues that are expected to be available over the life of the plan. Federal regulations also require fiscal restraint be determined using Year-of-Expenditure (Y-O-E) dollars to account for inflation on project costs.

The funded plan, outlined in Chapter 4, represents the projects from throughout the region that can be completed with the revenue that is expected to be available over the life of Mobilizing Tomorrow. The key decision in developing the financial methodology were considered and approved by the Mobilizing Tomorrow Steering Committee. The assumptions set forth regarding funding availability were developed with review by federal, state, and transit partners.

Funding Sources

The MPO identified federal, state, and local revenue sources that the region anticipates receiving through the year 2050. The revenue estimates were prepared using historical data and trends.¹ The Financial Plan anticipates \$2.8 billion (Y-O-E) in federal, state, and local revenue through the year 2050.

Roadway Funding

Federal Funding

Federal funds allocated to states and local governments are derived from modal trust funds funded through user fees. The Highway Revenue Act of 1956 created the Highway Trust Fund (HTF) to provide a dependable source of funding for the Interstate System. The HTF is funded through user fees applied to fuel taxes, heavy vehicle use taxes, and taxes on purchases of trucks and truck tires. The HTF has two divisions; the highway account and the mass transit account. According to the Iowa DOT, Iowa contributed \$499.2 million to the highway account and \$65.8 million to the mass transit account in 2012. The HTF's highway account provides funds for a number of programs, ranging from construction and maintenance to safety. The HTF's mass transit account provides funds for the construction and operation of transit systems.

¹ Additional information on historic trends is located in Appendix D.

The MPO annually receives Surface Transportation Program (STP) and Transportation Alternative Program (TAP) funds from the US DOT, which are allocated to member governments to implement transportation projects, Figure 3.1 provides a summary for projected STP and TAP funding through 2050.

FIGURE 3.1: FEDERAL FUNDING PROJECTIONS

FUNDING TYPE	2015-2024	2025-2034	2035-2050	TOTAL
STP	\$121,731,000	\$139,685,000	\$263,224,000	\$524,640,000
TAP	\$12,110,000	\$14,180,000	\$27,264,000	\$53,554,000
Total	\$133,841,000	\$153,865,000	\$290,488,000	\$578,194,000

State Funding

Funds derived from State-assessed fees on fuel, motor vehicle sales, vehicle registrations, and other transportation-related transactions support numerous funding programs. The following sections describe State of Iowa funding programs available for streets and highways, bicycle and pedestrian facilities, and public transportation systems.

The State of Iowa's primary revenue source is the Road Use Tax Fund (RUTF). The 53rd Iowa General Assembly created the RUTF in 1949 to provide a dependable source of funding for the State of Iowa's primary, secondary, and municipal street and highway system. Similar to the HTF, the RUTF is funded through user fees. These user fees include fuel taxes, motor vehicle registration fees, motor vehicle use tax, driver's license fees, and other miscellaneous sources.

Local Funding

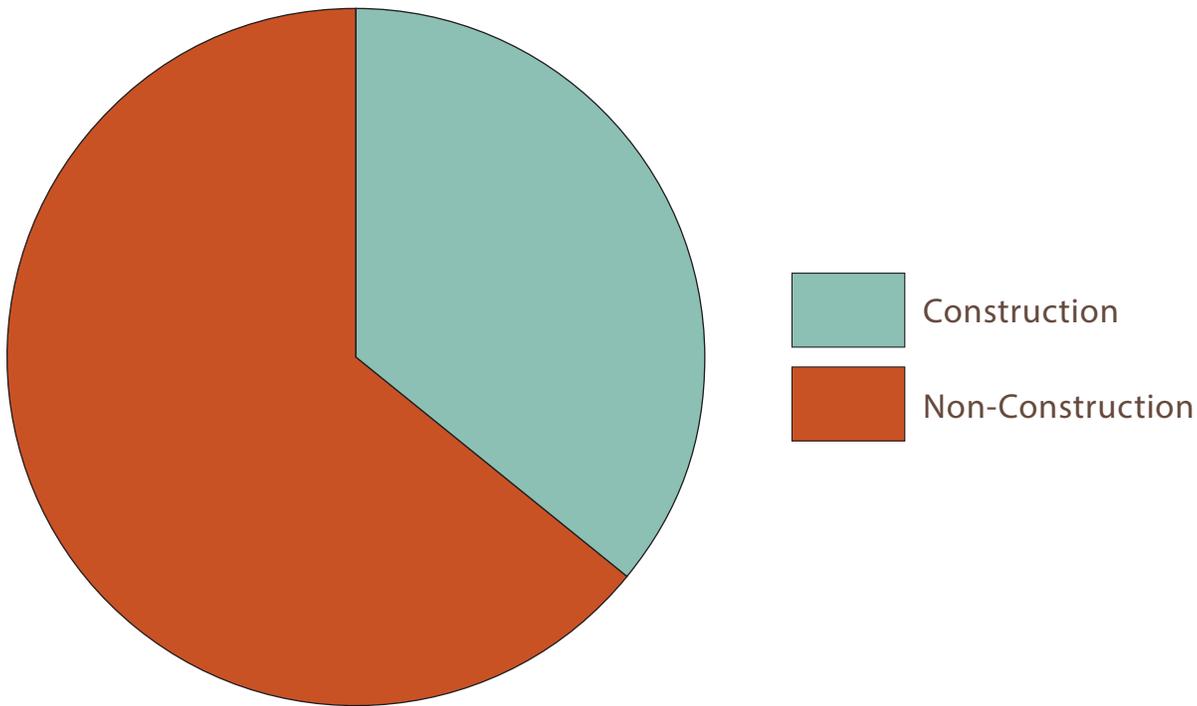
The MPO member governments and participating agencies generate local revenues for transportation improvements. Sources include debt service (proceeds from bonds sold, notes, and loans) property taxes, tax increment financing districts (TIF), special assessments, and developer contributions. One should note that local revenue sources, as well as the amount of revenues generated, are the decisions of the local jurisdiction.

Figure 3.2 shows the projected funding that is reasonably expected to be available over the life of the plan. A review of the Street Finance Reports over the last six years indicated that 64 percent of the available non-federal revenue for transportation is spent on non-construction expenditures, as indicated in Figure 3.3. The projections assume that this trend will continue into the future. Therefore 64 percent of projected state and local revenues were subtracted from the total to accurately reflect the available revenue for capital projects.

FIGURE 3.2: FISCAL CAPACITY

FUNDING TYPE	2015-2024	2025-2034	2035-2050	TOTAL
Federal	\$133,841,000	\$153,865,000	\$290,488,000	\$578,194,000
State	\$607,164,000	\$716,159,000	\$1,372,565,000	\$2,695,889,000
Local	\$1,337,575,000	\$1,337,575,000	\$2,140,120,000	\$4,815,270,000
Non-Construction Expenditures	(\$1,244,633,000)	(\$1,314,390,000)	(\$2,248,118,000)	(\$4,807,142,000)
Total Revenue	\$833,947,000	\$893,209,000	\$1,555,055,000	\$3,282,211,000

FIGURE 3.3: CONSTRUCTION VS. NON-CONSTRUCTION EXPENDITURES, 2008 TO 2013



Other Federal Funding

The following is a list of other federal funding sources. Some of these include programs that member governments are eligible to apply for to fund projects. These include the CMAQ and STP-HBP funds and were not included in the funding projects as the annual awards to member governments are unpredictable. The other funds listed are used to fund Iowa DOT projects.

Congestion Mitigation and Air Quality Improvement Program (CMAQ): CMAQ provides flexible funding for transportation projects and programs tasked with helping to meet the requirements of the Clean Air Act. These projects can include those that reduce congestion and improve air quality.

National Highway Performance Program (NHPP): This program consolidates the National Highway System and the Interstate Maintenance Program into one program. NHPP expands the number of eligible roadway miles and funds may be used to construct or improve NHS roadways, including state highways, U.S. highways, and Interstates.

STP Highway Bridge Program (STP-HBP): While the Highway Bridge Program was eliminated in MAP-21, a portion of Iowa's STP will continue to be targeted directly to counties and dedicated specifically to county bridge projects. A portion of these funds are required to be obligated for off-system bridges. The remaining funds can be used on either on-system or off-system bridges.

Highway Safety Improvement Program (HSIP): This is a core Federal-aid program that funds projects with the goal of achieving a significant reduction in traffic fatalities and serious injuries on public roads. Portions of these funds are set aside for use on high-risk rural roads.

Federal Lands Access Program (FLAP) and Tribal Transportation Program (TTP): The FLAP Program provides funding for projects that improve access within, and to, federal lands. The FLAP funding will be distributed through a grant process where a group of FHWA, Iowa DOT, and local government representatives will solicit, rank, and select projects to receive funding. The TTP provides safe and adequate transportation and public road access to and within Indian reservations and Indian lands. Funds

are distributed based on a statutory formula based on tribal population, road mileage, and average tribal shares of the former Tribal Transportation Allocation Methodology.

Demonstration Funding (DEMO): Demonstration funding is a combination of different programs and sources. The FHWA administers discretionary programs through various offices representing special funding categories, and an appropriation bill is used to provide money to a discretionary program. Other examples can include special congressionally directed appropriations during the reauthorization of the transportation bill or through legislative acts, such as the American Recovery and Reinvestment Act of 2009 (ARRA).

Transit Funding

The following figure summarizes funding projections for the public transportation system. Funding is segmented into capital and operational funding to more accurately reflect how DART would likely use each funding source. The projected funding is only for DART's services; funding projections for other services, such as passenger rail, are unknown at this time.

FIGURE 3.4: DART'S PROJECTED REVENUE 2015-2050

FUNDING SOURCE	2015-2024	2025-2034	2035-2050	TOTAL
Transit Capital				
Federal	\$108,820,000	\$140,645,000	\$212,837,000	\$462,302,000
State	\$2,095,000	\$-	\$-	\$2,095,000
Local	\$24,569,000	\$36,488,000	\$62,254,000	\$123,311,000
Total Capital	\$135,484,000	\$177,133,000	\$275,091,000	\$587,708,000
Transit Operating				
Federal	\$43,582,000	\$44,796,000	\$75,270,000	\$163,648,000
State	\$13,183,000	\$17,717,000	\$41,819,000	\$72,719,000
Local	\$310,901,000	\$476,331,000	\$1,180,219,000	\$1,967,451,000
Total Operating	\$367,666,000	\$538,844,000	\$1,297,308,000	\$2,203,818,000
Total	\$503,150,000	\$715,977,000	\$1,572,399,000	\$2,791,526,000

The following is a list of federal and state funding programs for transit investments.

Metropolitan Planning Program (Section 5303): FTA provides funding for this program to the State based on its urbanized area populations. The funds are dedicated to support transportation planning projects in urbanized areas with more than 50,000 population.

Urbanized Area Formula Program (Section 5307): FTA provides transit operating, planning, and capital assistance funds directly to local recipients in urbanized areas with populations between 50,000 and 200,000, based on population and density figures, plus transit performance factors for larger areas. Local recipients, for whom projects are programmed by the Des Moines Area MPO, must apply directly to the FTA.

Capital Investment Program (Section 5309): The transit discretionary program provides Federal assistance for major capital needs, such as fleet replacement and construction of transit facilities. All transit systems in the state are eligible for this program. In recent years, Congress has earmarked all of these funds for specific projects or geographic regions.

Special Needs Program (Section 5310): Funding is provided through this program to increase the mobility for the elderly and persons with disabilities. Part of the funding is administered along with the Non-Urbanized funding; another part is allocated among urbanized transit systems.

Non-Urbanized Area Formula Program (Section 5311): This program provides capital and operating assistance for rural and small urban transit systems. Fifteen percent of these funds are allocated to Intercity Bus projects. A portion of the funding is also allocated to support rural transit planning.

Rural Transit Assistance Program (RTAP - Section 5311(h)): This funding is also used for statewide training events and to support transit funding fellowships for regional and small urban transit staff or planners.

Statewide Transportation Planning Program (Section 5304): These funds come to the state based on population and are used to support transportation planning projects in non-urbanized areas.

Flexible Funds: Certain Title 23 funds may be used for transit purposes. Transit capital assistance is an eligible use of STP funds. Transit capital and start-up operating assistance is an eligible use of ICAAP funds. When ICAAP and STP funds are programmed for transit projects, they are transferred to the FTA. The ICAAP funds are applied for and administered by the Office of Public Transit.

Discretionary Funds: Competitive, discretionary funding programs, such as the federal TIGER and New Starts programs, are available to help fund large projects like BRT.

State Transit Assistance (STA): All public transit systems are eligible for funding. These funds can be used by the public transit system for operating, capital, or planning expenses related to the provision of open-to-the-public passenger transportation.

Property Tax Levy: The Code of Iowa authorizes municipalities to establish a transit levy dedicated to support public transit up to the maximum amount of \$0.95 per \$1,000 dollars of valuation. DART employs a local property tax levy, which varies by DART member community depending on the amount of service provided to that community. DART also receives local funds, including, but not limited to, fare box revenue, revenue from contracts with business and other transportation providers (such as taxicabs or human service providers), and advertising revenue.

Iowa Department of Transportation Funding

Over the last 10 years, the Iowa DOT has invested an average of approximately \$68.5 million per year in the MPO planning area. Iowa DOT funding was projected by applying a 3 percent annual growth rate to the 10 year average. Figure 3.5 summarizes the funding available for projects on the DOT system.

FIGURE 3.5: IOWA DOT FUNDING PROJECTIONS

FUNDING SOURCE	2015-2024	2025-2034	2035-2050	TOTAL
DOT Funding	\$803,025,000	\$1,003,525,000	\$2,033,080,000	\$3,839,630,000

Funding Risks and Opportunities

Projecting available revenue requires making certain assumptions concerning how probable future scenarios might affect the fiscal capacity for the region.

Funding Risks

Trust Fund Insolvency

The Highway Trust Fund is nearing insolvency and will not be able to meet its 2015 obligation unless measure are taken to address the issue. To bring the HTF into balance, a spending cut of 92 percent or a gas tax increase of 50 percent will be necessary. Currently, the HTF is being kept afloat by transfers from the general fund. Since 2008, a total of \$54 billion has been transferred and an additional \$14 billion is necessary to prevent a shortfall in 2015.

Iowa's Road Use Tax Fund faces similar challenges. The Iowa Department of Transportation is projecting a \$32.5 billion shortfall over the next 20 years and a critical need shortfall of \$4.3 billion over the same timeframe.

The MPO's revenue projections accounted for the uncertainty concerning the Highway Trust Fund by assuming a conservative 5 percent annual increase in STP and TAP funds compared to the 10 percent annual increase observed since 1999. Similarly, the annual growth rate for the RUTF was assumed to be 3 percent compared to 4 percent historic average.

Petroleum Costs

In 1994, crude oil cost was approximately \$30² per barrel. Today, the cost has increased to just over \$100³ per barrel, an increase of 233 percent or 12 percent annually. The US Energy Information Administration forecasts this cost to increase as high as \$200 per barrel by 2040.⁴ Gas prices have followed a similar trend. In 2004, a gallon of gasoline in Des Moines cost \$1.72.⁵ Today, the cost has increased to just over \$3.50,⁶ an increase of 103 percent or 10 percent annually. Continually increasing fuel costs could have a profound effect on travel demand and, therefore, transportation funding over the coming decades.

Property Tax Rollback

In 2013, the Iowa Legislature passed a property tax reform bill that reduced the tax rate on commercial property to 90 percent of the assessed value. The Iowa League of Cities estimates that by 2024 this reform will have cost MPO member governments approximately \$130 million. This has a significant impact on local governments since a majority of local funding is derived through the property tax.

The MPO revenue projections account for the property tax reform and a six year relatively flat growth rate in local funding available for transportation by assuming a zero growth rate for local funding. Instead the six year average for street and highway expenditures was assumed to continue into the future.

Funding Opportunities

2 <http://www.macrotrends.net/1369/crude-oil-price-history-chart>

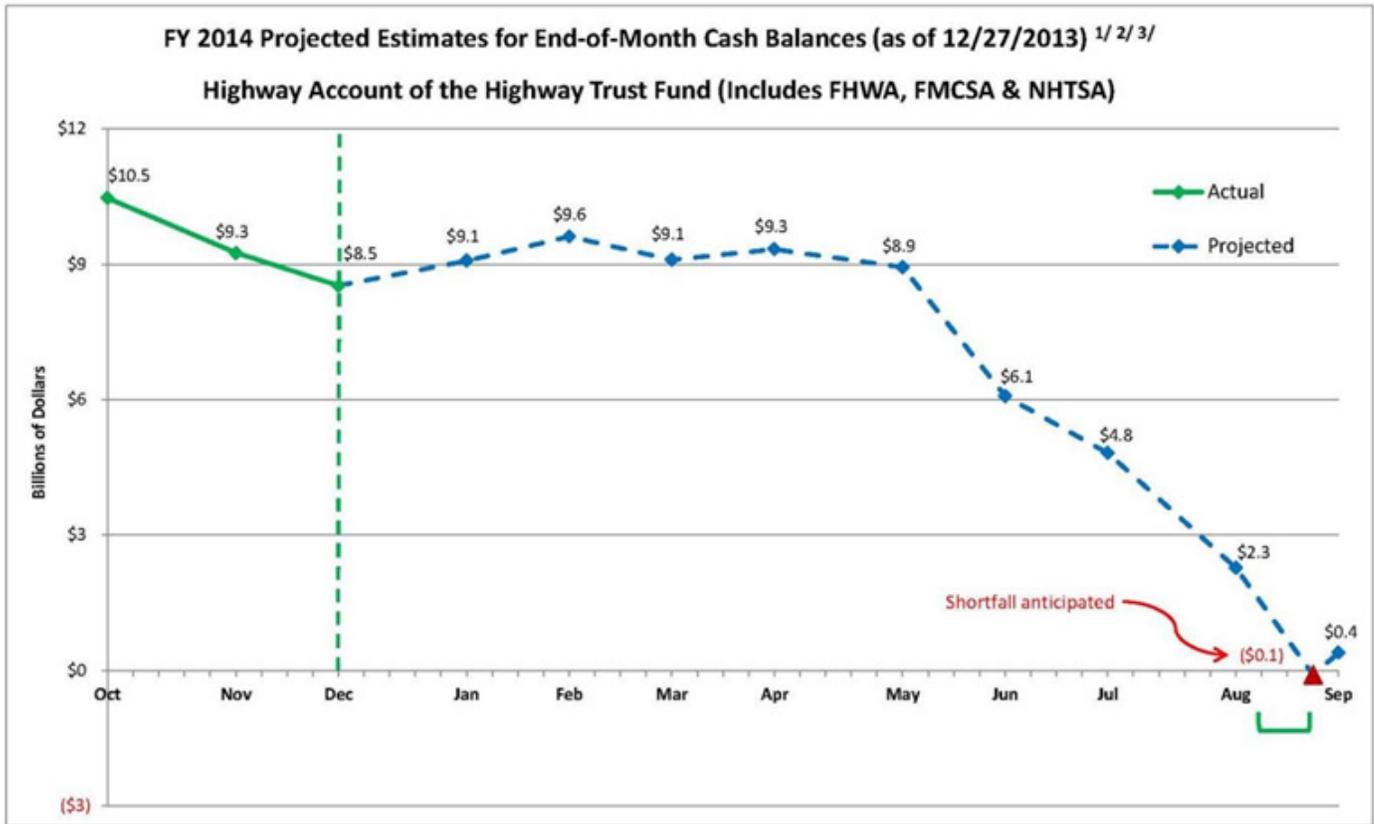
3 <http://www.macrotrends.net/1369/crude-oil-price-history-chart>

4 http://www.eia.gov/forecasts/aeo/er/early_prices.cfm

5 http://www.desmoinesgasprices.com/retail_price_chart.aspx

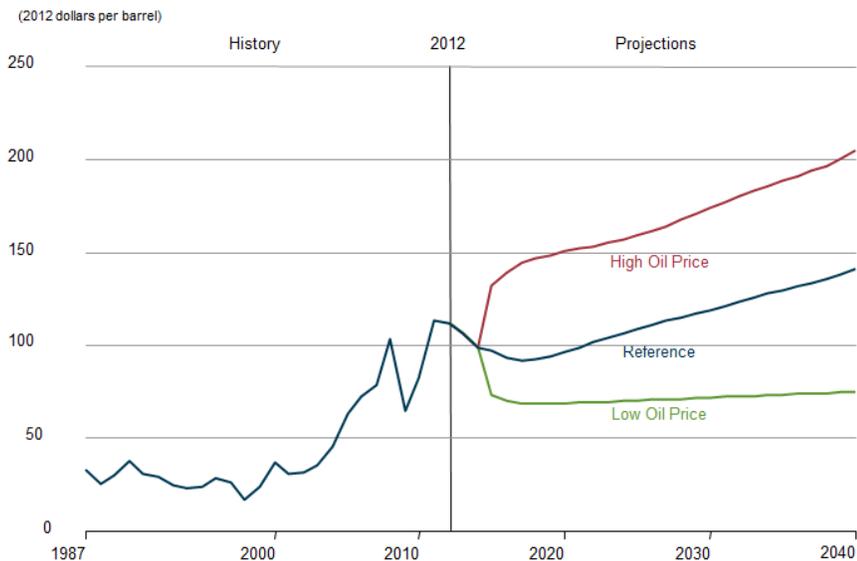
6 http://www.desmoinesgasprices.com/retail_price_chart.aspx

FIGURE 3.6: HIGHWAY TRUST FUND CASH BALANCE



1/ Graph reflects actual data through 12/27/13 and end-of-month projections for the remainder of the fiscal year.
 2/ Total receipt and outlay projections are based on FY 2014 Mid-Session Review assumptions. Projected monthly receipt and outlay rates are based on historic averages.
 3/ Range of anticipated shortfall: Green brackets denote the estimated window of when the anticipated shortfall will occur.
 Source: FHWA

FIGURE 3.7: AVERAGE ANNUAL CRUDE OIL PRICES IN THREE CASTS, 1987-2040 (2012 DOLLARS PER BARREL)



Source: US Energy Information Administration



Local Option Sales Tax

The Code of Iowa allows for cities and counties to adopt up to an additional one percent sales tax, which may be used for any lawful purpose aside from the benefit of a school district. Currently Polk City is the only community in the MPO area to have adopted a local option sales tax. The adoption of a local option sales tax by all MPO communities would generate approximately \$74 million annually based on average taxable sales figures from the past five years.

User Fee Increases

The primary source of federal and state user fees is a per gallon tax of fuel purchases. The federal gas tax was last increased in 1993, and the Iowa gas tax was last raised in 1989. In recent years, some industry groups, governmental entities, and members of the public have made increased calls to an increase in both the federal and state gas taxes to alleviate anticipated shortfalls in both the HTF and the RUTF. As a result, efforts have been made by both federal and state legislators to increase the gas tax as well as to develop new systems for generating user fees.

Potential Investment Strategies

Mobilizing Tomorrow represents a paradigm shift for the MPO. It is the first time the MPO is looking at project merits and comparing different packages of projects to determine which are eligible for future MPO funding.

During the development process, the Mobilizing Tomorrow Steering Committee and the MPO Planning and Engineering Subcommittees provided input and guidance to the MPO staff, which then refined several investment strategies for the region. These investment strategies — packages of projects — represent alternate futures for the region and enable policy makers to determine what is most important to them.

The key is to strike the appropriate balance of making significant progress in achieving all four goals of Mobilizing Tomorrow. The goals may never be fully realized, but, working together, the region's transportation system and, thus, quality of life, can be dramatically improved.

Cost to Meet Performance Targets

Chapter 2 identified several performance targets for the region. The MPO was able to associate the costs necessary to achieve the performance target for certain measures, as shown in Figure 3.8. This information, paired with the projects submitted by local governments, helps the MPO to develop a funding strategy to implement the plan.

FIGURE 3.8: COSTS TO ACHIEVE PERFORMANCE TARGETS

TARGET	COST (2014 \$)
Complete 54 miles of trail gaps	\$27 million
Maintain current pavement condition	\$40 million annually (\$10 million increase from current levels)
Build 400 miles of on-street bike facilities	\$20 million
Maintain recommended transit fleet age	\$61 million

Costs vs. Revenues

The MPO solicited projects from its member governments. Figure 3.9 provides a summary of the types of projects that were submitted and their associated costs. MPO member governments submitted a total of 539 projects totaling \$11.6 billion. As noted in Figure 3.9, costs necessary to implement projects proposed by MPO member governments outweigh available revenue. To comply with fiscal constraint requirements, the projects outlined in this plan fall into two categories:

- **Funded projects:** include projects that are part of the region's fiscally constrained list. Funding sources have been identified for these projects to become a reality.
- **Illustrative projects:** includes projects that have been identified but lack adequate funding.

FIGURE 3.9: SUBMITTED PROJECT SUMMARY

PROJECT TYPE	NUMBER OF PROJECTS	TOTAL COST (THROUGH 2050)	TOTAL REVENUE AVAILABLE (THROUGH 2050)	FUNDING SHORTFALL
Roadway	353	\$4,358,490,301		
Bridge	46	\$313,066,474		
Bicycle/ Pedestrian	71	\$252,660,005		
MPO Projects Subtotal	470	\$4,924,216,780	\$3,282,211,000	\$1,642,005,780
Transit (capital costs only)	13	\$860,631,277	\$587,708,000	\$272,923,277
DOT	57	\$5,878,805,536	\$3,839,630,000	\$2,039,175,536
Total	539	\$11,649,053,593	\$7,704,549,000	\$3,944,504,593

Project Evaluation

To determine which projects are included in the funded list and which are deemed illustrative, the MPO developed evaluation criteria to rank projects by how well they address identified performance targets. Projects were selected from higher to lower ranking until no revenue remained. All other projects were classified as illustrative. Multiple packages of projects were considered to help determine the final mix of projects to include in the fiscally-constrained list. These options considered different funding amounts, different percentages allocated to specific uses, and the degree to which each package might be accepted politically. Ultimately the MPO determined a preferred investment strategy that balances progress towards achieving performance targets and ensuring access to funds for all member communities.

Recommended Investment Strategy

The MPO developed an investment strategy for the Mobilizing Tomorrow that targets funding into six categories – roadway, system preservation and optimization, bridge, transit, transportation alternatives, and flex. The investment strategy recommended by the MPO considers only federal funds the MPO controls (STP & TAP funds) and non-federal match at a 40 percent federal – 60 percent non-federal ratio. For purposes of forecasting revenue for fiscal constraint, the transit, system preservation and optimization, and bridge categories are dedicated set-asides with minimum funding targets (10 percent of STP funds each for transit and system preservation and optimization, and 15 percent of STP funds for bridges). A maximum of 60 percent of STP funds are targeted to fund the regionally significant roadway projects listed in this plan. An additional five percent of STP funds would be left unallocated in a flex category, which would be available to any eligible STP use in a given year. TAP funds would be dedicated exclusively to transportation alternatives. Figure 3.10 summarizes the breakdown of available STP and TAP funds considered in each time period of Mobilizing Tomorrow.

Roadway Category

The roadway category will be used to fund street and highway projects proposed by MPO member governments. As discussed further in Chapter 4 and Appendix E, projects were reviewed based on performance against the plan's performance targets and placed into either a fiscally-constrained list or an illustrative list. Projects included in the fiscally-constrained list are eligible for funds within the roadway category. The MPO will determine which projects from the eligible list will receive funds on an annual basis.

Bridge Category

The purpose of the bridge category is to dedicate funds for bridges deemed structurally-deficient or functional-obsolete. This program will be modeled off the Iowa DOT's city bridge program where funding is awarded to eligible bridges based on the rank of the bridge and the willingness of the community to move forward with the project. The MPO will review the latest bridge condition information annually to determine which bridges will receive funds.

System Preservation + Optimization Category

The purpose of the system preservation and optimization category is to dedicate a pot of funding to address the critical maintenance needs facing the region. This set-aside alone does not fully address the overall maintenance need identified in Mobilizing Tomorrow, but is intended to be used in conjunction with local funds to assist communities with maintenance projects. Because maintenance needs can change annually, the MPO will review maintenance conditions and candidate projects submitted by member governments annually to determine funding awards. In addition to maintenance projects, non-capacity projects that optimize the system, such as traffic signal coordination and other Intelligent Transportation Systems solutions, are eligible.

Transit Category

The transit category will provide a funding set-aside to assist DART with capital projects such as the purchase of buses and other infrastructure.

Transportation Alternatives Category

The transportation alternatives category uses TAP funds allocated to the MPO. TAP provides funding for alternative transportation projects such as bicycle and pedestrian facilities. The purpose of the MPO's transportation alternatives category is to fund regionally significant gaps in the trail system and expand the on-street bicycle network. These funds should also be used to enhance the pedestrian realm through streetscape improvement, bus shelter installation, and improving pedestrian facilities near schools.

Flex Category

The flex category reserves five percent of available STP funds to be used on any eligible STP use depending on the need in a given year.

The strategy outlined must be fiscally-constrained. Figure 3.11 outlines the projected non-federal funds expected to be available through HY 2050. The total local match required is subtracted from the total matching funds available. Figure 3.11 shows a positive balance which indicates that the MPO can implement the investment strategy outlined in this chapter within the projected fiscal capacity.¹ The remaining funds shown are available to communities to implement local projects and maintenance activities.

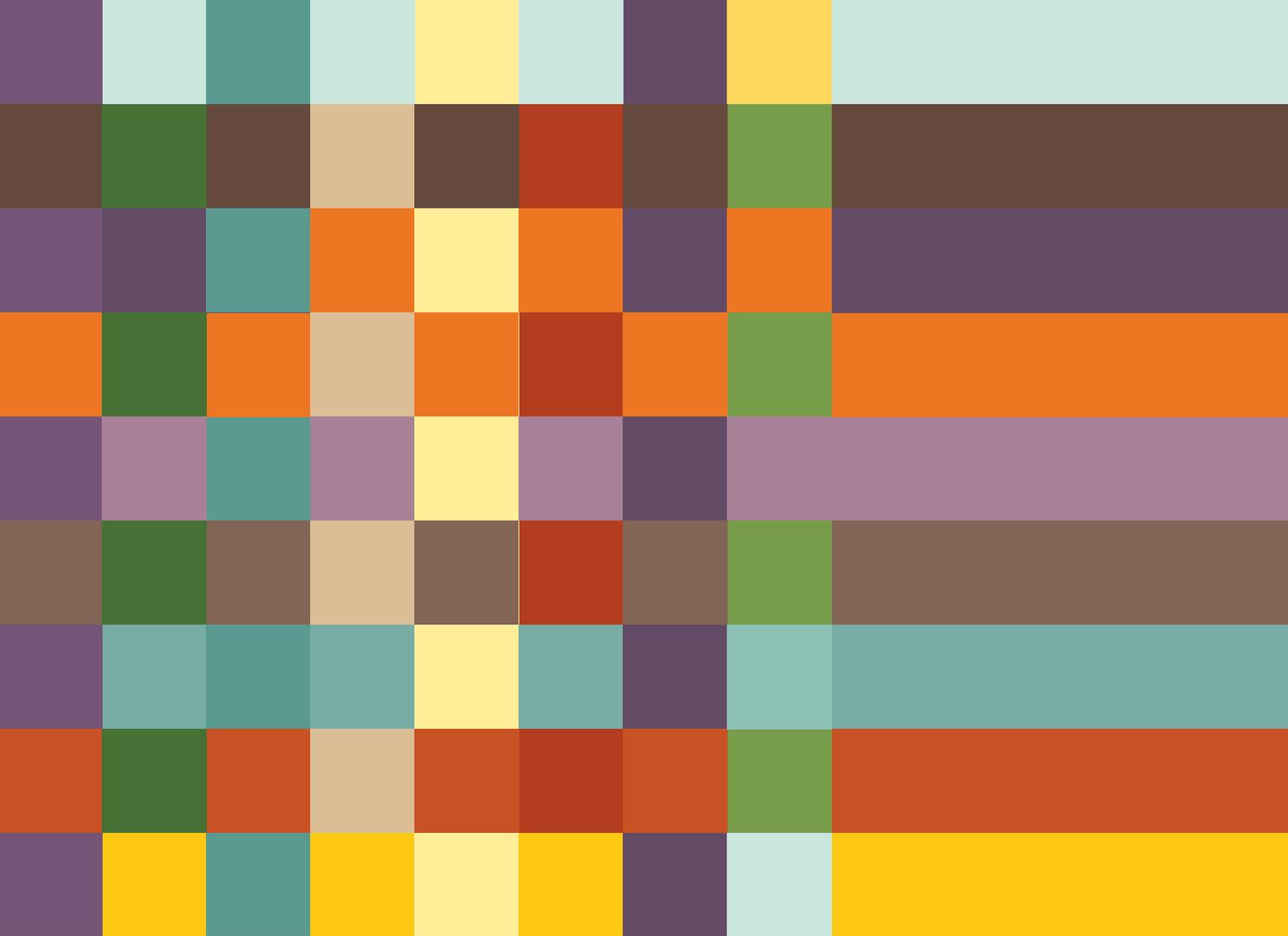
¹ Only match from local communities shown. Match for the transit category comes from DART and is not included in Figure 3.12.

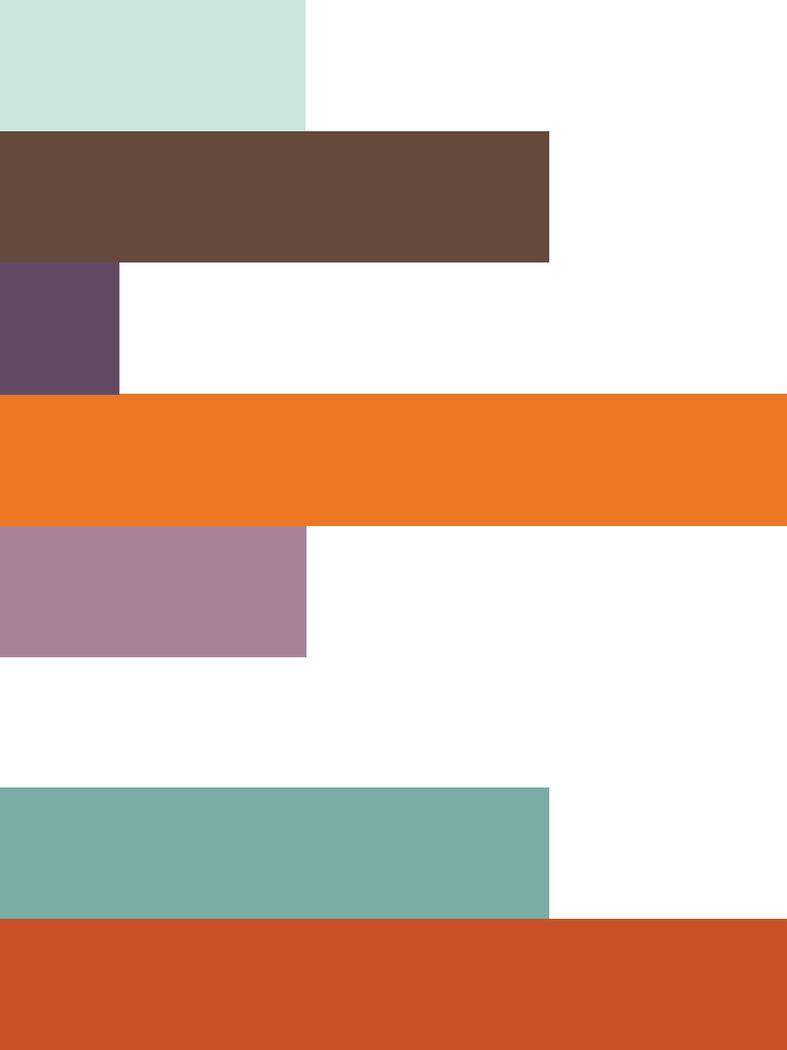
FIGURE 3.10: REVENUE AVAILABLE

FUNDING CATEGORY	2015-2024	2025-2034	2035-2050	TOTAL
Federal Funds by Category (40% of Funding)				
STP Funds	\$121,731,000	\$139,685,000	\$263,244,000	\$524,640,000
System Preservation & Optimization (10% of STP)	\$12,173,000	\$13,968,500	\$26,324,400	\$52,464,000
Bridge (15% of STP)	\$18,259,650	\$20,952,750	\$39,486,600	\$78,696,000
Roadway (60% of STP)	\$73,038,600	\$83,811,000	\$157,946,400	\$314,784,000
Transit (10% of STP)	\$12,173,100	\$13,968,500	\$26,324,400	\$52,464,000
Flex (5% of STP)	\$6,086,550	\$6,984,250	\$13,162,200	\$26,232,000
TAP Funds	\$12,109,760	\$14,180,000	\$27,264,000	\$53,553,760
Total Federal Funds	\$133,841,000	\$153,865,000	\$290,488,000	\$578,194,000
Local Match Funds by Category (60% of Funding)				
STP Match	\$182,596,500	\$209,527,500	\$394,866,000	\$786,960,000
System Preservation & Optimization	\$18,259,650	\$20,952,750	\$39,486,600	\$78,696,000
Bridge	\$27,389,475	\$31,429,125	\$59,229,900	\$118,044,000
Roadway	\$109,557,900	\$125,716,500	\$236,919,600	\$472,176,000
Transit	\$18,259,650	\$20,952,750	\$39,486,600	\$78,696,000
Flex	\$9,129,825	\$10,476,375	\$19,743,300	\$39,348,000
TAP Match	\$18,165,000	\$21,270,000	\$40,896,000	\$80,331,000
Total Matching Funds	\$200,761,500	\$230,797,500	\$435,762,000	\$867,291,000
Total Funding Available by Category (100% of Funding)				
STP-Eligible Total Revenue	\$304,327,500	\$349,212,500	\$658,110,000	\$1,311,600,000
System Preservation & Optimization	\$30,432,750	\$34,921,250	\$65,811,000	\$131,160,000
Bridge	\$45,649,125	\$52,381,875	\$98,716,500	\$196,740,000
Roadway	\$182,596,500	\$209,527,500	\$394,866,000	\$786,960,000
Transit	\$30,432,750	\$34,921,250	\$65,811,000	\$131,160,000
Flex	\$15,216,375	\$17,460,625	\$32,905,500	\$65,580,000
TAP-Eligible Total Revenue	\$30,275,000	\$35,450,000	\$68,160,000	\$133,885,000
Total Revenue Available	\$334,602,500	\$384,662,500	\$726,270,000	\$1,445,485,000

FIGURE 3.11: FISCAL CAPACITY OF INVESTMENT STRATEGY

FUNDING TYPE	2015-2024	2025-2034	2035-2050	TOTAL
Available Matching Funds	\$700,106,000	\$739,344,000	\$1,264,567,000	\$2,704,017,000
Local Match Required	(\$182,501,850)	(\$209,844,750)	(\$396,275,400)	(\$788,595,000)
Balance	\$517,604,150	\$529,499,250	\$868,291,600	\$1,915,422,000





4



TAKING
ACTION

TAKING ACTION

Mobilizing Tomorrow is a plan to guide the future development of the transportation system. This chapter outlines policy recommendations and capital projects to move the region towards achieving the goals and performance targets outlined in this plan.

Policy Toolkit

MPO member governments have a prime opportunity to mold the transportation network into a more robust system that offers more choices. The following section identifies a number of policies that the region and communities can adopt to improve the transportation system. While the MPO recognizes these policies may work differently in different communities, MPO members are encouraged to consider them and adopt them in full or part, which may streamline and thus decrease the cost of development, expand transportation choices, and mitigate environmental issues.

Chapter 5 includes more technical specifications for many of the policies included in this section.

Multimodal Access

Looking to the year 2050, Greater Des Moines will experience significant demographic changes. Nearly 140,000 Baby Boomers call the region home. The “graying” of the region will have implications for the transportation system, land use, and the placement of homes, businesses, and stores. Perhaps an even larger impact, though, could come from Generations X, Y, and Z — generally those under the age of 45 and who comprise nearly two-thirds of the region’s population. These generations have demonstrated different lifestyle choices and preferences than older generations. For instance, the share of new vehicles purchased by those aged 18 to 34 dropped 30 percent in the last five years. With these anticipated demographic shifts, creating a region where walking, biking, and using public transportation are as viable as driving will be imperative.

As noted in Chapter 2, the region’s roadway network observes very low levels of congestion today, and forecasts indicate it will maintain a low level of congestion into the future. Even without roadway capacity additions, projections for the year 2050 do not show any significant deterioration in commute times or increased congestion around Greater Des Moines. Given this abundance of roadway capacity, Greater Des Moines can still grow while shifting funding priorities to those modes that increase transportation choice.

The region can place new emphasis on walking, biking, and public transportation such that they become options as viable as driving. Pedestrians who can walk to different land uses, such as retail establishments, parks, and community facilities, in under 10 minutes are more likely to visit those places. Placing daily goods and services, as well as recreational destinations, within walking distance of residences increases the incentives for residents to avoid using their cars, thereby reducing traffic and wear-and-tear on the roads.

Another strategy would be to further the use of bicycle infrastructure for commuting. Complete streets have been implemented around the globe and result in multimodal access to the places we live, work, learn, and play. They typically include shared lanes, bike lanes, or cycle tracks. Complete streets should be implemented throughout Greater Des Moines, as they are accessible and friendly to users of all modes, including drivers, bicyclists, and public transportation riders.

Furthering the use of public transportation has and will continue to be a challenge for Greater Des Moines, due in large part to the lack of congestion and the short commute times, which provide little incentive to switch from private vehicles. Though bus service frequency has improved, it is often still quicker to travel by personal vehicle. Considering that future congestion is projected to be minimal, our region can at least redirect resources from private vehicle infrastructure to public transportation infrastructure in order to provide a positive incentive to switch modes.

Not only are walking, biking, and using public transportation key to increasing the mobility of Greater Des Moines residents, they are central to furthering residents' health and well-being. Every walk or bike ride is a chance for exercise and social interaction, which create a healthy and welcoming community. Additionally, walking and biking require little space for each person engaged in those activities; the more people who walk and bike, the more space can be dedicated to other uses chosen by each community. People who use wheelchairs also benefit from increased pedestrian facilities when designed to Americans with Disabilities Act (ADA) standards.

Every trip starts and ends as a pedestrian trip. As a result, improvements to the pedestrian experience benefit everyone. Additionally, no forms of travel are healthier than walking and bicycling. Providing all residents with the option of walking and biking is at the heart of supporting the region's health and wellbeing. To do so requires safe, comfortable environments with all users in mind. The following six fundamental pedestrian conditions should be provided, especially in mixed-use districts, around schools, and at connections to transit. It should be noted that these conditions benefit cyclists and users of other transportation modes as well.

- **Safety:** Pedestrians are well protected from road hazards such as vehicles.
- **Security:** Pedestrians are not susceptible to real or perceived robberies or other crimes.
- **Directness:** Pedestrian paths minimize distances traveled. People will always find the most direct route anyway, regardless of where a path leads.
- **Ease of Entry:** Walking is not onerous, so steep inclines and staircases are avoided.
- **Comfort:** Paths provide high quality space appropriate to the location and destinations.
- **Aesthetics:** Environments are pleasing to the eye and inspire a person to walk to the next corner.

Creating a region where walking, biking, and taking public transportation are as viable as driving will be an incremental process to create a greater mix of transportation choices, including a robust transit network, an active carpool culture, multiple Transportation Demand Management programs, and land use and design that support walkability. Multiple steps are necessary to achieve this shift, as summarized in the following steps.

Invest in a complete transportation system

While the road network provides efficient commutes and creates conveniences for motorists, this oversupply of capacity hinders the further development of other transportation modes. Greater Des Moines must invest in a complete transportation system — beyond one geared towards automobiles only — if it is to become a more sustainable region. The region should:

- Invest in the rehabilitation of existing infrastructure in order to maintain regional traffic operations and to make the most of significant investments made over the past decades.
- Reprioritize transportation funding to maintain the current transportation infrastructure but also increase the availability of funding that can be used to improve the transit, pedestrian, and bicycle networks. Applying transportation funds across the whole system will allow travelers the option of using multiple modes. This gives drivers

additional options for getting around and gives non-drivers a feasible way to move through the region. The goal of reprioritizing transportation funding is to ensure that travel times in the region remain at or near current levels and population growth doesn't lead to increased traffic.

Leverage the investment in public transportation and in the bicycle and pedestrian networks by co-locating land uses and making these modes user friendly

Transportation and land use directly affect one another; the placement of a roadway has implications for the adjacent land uses and vice versa. The same is true for other modes, including public transportation, biking, and walking. As we move toward 2050, we have the opportunity to take advantage of this relationship.

The DART Forward 2035 Plan recommends route alignments based on existing and planned densities of residents and employees. Matching transit service with where people live and work is the best way to maximize access and to operate a system most efficiently. It is also important that the transit stops are accessible by bicycle and by foot. In both the short- and long-term, the geography of future development across the region should align with the region's transit routes, and it should be linked to the bicycle and pedestrian networks. To accomplish these aims, Greater Des Moines should:

- Promote employment and residential infrastructure along transit corridors to ensure a critical mass of riders.
- Increase transit service as density increases.
- Reduce municipal parking requirements as transit service schedules increase.
- Promote regional equity through increased access to public transportation and multimodal options in neighborhoods where automobile ownership is at reduced levels.
- Acquire the old Rock Island Railroad Depot for use as a passenger rail station.

Riding transit should be easy for everyone to figure out. In the short-term, schedules and maps should be available at all stops, online, via phone, and in hard copy at prominent locations like libraries. In the longer-term, employers, residential brokers, and building managers/superintendents should provide schedules and maps to new employees and new residents. Material should be available in all of the major languages spoken in the region. Anyone who moves to Greater Des Moines should be able to understand the system on his or her first day.

Greater Des Moines has already made significant investments in its bicycle and pedestrian networks. The region should build upon this base in order to enhance its multimodal transportation options. Linking these networks with public transit will also ensure that these facilities serve as viable commuting options in addition to being recreation outlets. Greater Des Moines should:

- Ensure the presence of sidewalks on both sides of existing and future roadways.
- Identify, complete gaps, and make connections within the regional bicycle and pedestrian networks.
- Explore bicycle and pedestrian network management options and promotion that support year-round use.
- Offer a share-the-road educational series as part of a larger marketing campaign.

Enhance the region's freight network to support goods movement and economic development

The freight and goods movement network within Greater Des Moines should be safe, reliable, and efficient. Freight is critical to the success of the economy of Greater Des Moines and of the State of Iowa. Greater Des Moines sits at a crossroads of North American freight traffic through the intersection of Interstates 80 and 35. The area's freight network includes an inland port, four Class 1 railroads, and cargo operations at the Des Moines International Airport, and four Class 1 railroads, which are large freight railroad companies, as classified based on operating revenue. Currently, those revenues must be \$250 million or more after adjusting for inflation using a Railroad Freight Price Index developed by the Bureau of Labor Statistics.

Freight systems need to efficiently move both import and export goods. Greater Des Moines exported approximately \$2.5 billion in goods and services in 2012, making it the 82nd largest exporter region in the United States. Greater Des Moines's export growth rate is a high 10.7 percent, giving it the 51st highest growth rate in the nation and indicating a need for continued support of goods movement.⁹ Providing the freight industry with a safe, reliable, and efficient freight network can keep Greater Des Moines on a path of economic viability. To achieve these aims, Greater Des Moines should:

- Promote air, rail, and truck freight options, and explore the development of an inland port where goods can transfer among modes.
- Work with the freight industry to reduce regional impediments to freight and goods movement.
- Maximize the efficiency of goods movement in Greater Des Moines.
- Identify opportunities to expand the goods movement system.

Prepare for changes in the transportation system

The Tomorrow Plan looks nearly forty years into the future. Much can change in that time. We are potentially at the cusp of major transportation shifts — in terms of what the system looks like and how it is powered. The Greater Des Moines region must be able to adapt to these changes by tracking shifts in technology and related trends and by forming teams to address future infrastructure needs.

Educate residents and workers on the importance of a multimodal system

- Provide training for engineers and planners.
- Adopt nationally-accepted standards on bicycle and pedestrian facilities.
- Encourage the development of municipal-level bicycle and pedestrian plans.
- Work with DART to ensure that transit stops are more accessible to pedestrians.
- Implement a public education and marketing campaign to increase understanding and awareness related to a multimodal transportation system and to increase the knowledge of the relationship between the built environment and health and well-being.

Create a more walkable region

- Connect, install, and repair sidewalks.
- Plant and maintain trees and landscaping.
- Build wide sidewalks in areas of high pedestrian activity.
- Improve street crossings near schools and commercial areas.
- Enforce right-of-way priority and motorist travel speeds in high pedestrian volume areas.
- Review pedestrian planning procedures, particularly concerning construction of sidewalks in new residential and commercial developments.
- Provide land use opportunities that allow people to be within walking distance of commercial and retail activity destinations.
- Improve pedestrian accessibility at and to transit facilities.
- Improve intersection traffic signalization and crossing times for all users, including persons with disabilities, children, and the elderly.

Expand the network of on-road bicycle friendly facilities in Greater Des Moines

- Locate directional and informational signage along trails, as lane markings, and adjacent to roads.
- Reconfigure roads to allow all bicyclists to ride comfortably and safely, including the addition of shared lanes, bike lanes, or cycle tracks.
- Install more short- and long-term bicycle parking facilities.
- Provide clearly defined, safe, comfortable, and accessible bicycle commuter routes.
- Provide bicycle commuter amenities such as parking, showers, dressing rooms, and other end-of-trip facilities.
- Establish short- and long-term bicycle parking facilities near bus stops.
- Encourage the presence of paved shoulders on rural roadways.

Encourage compact, mixed-use development policies that create a more human-scale environment

- Promote the use of shorter block lengths in new developments, resulting in a fine-grained street network that features more intersections.
- Minimize the use of cul-de-sacs in order to maximize connectivity.
- Foster higher density development.
- Implement traffic calming methods to create bicycle and pedestrian friendly corridors.
- Install street furniture to create a more inviting pedestrian environment.

Enhance human service/public transportation coordination

The MPO annually works to promote joint, coordinated transportation planning programs that further the development of the local and regional public transportation systems by developing a Passenger Transportation Plan. The goal of the coordination effort is to limit service duplication, identify gaps in service, and identify opportunities for organizations to partner for services geared towards persons with disabilities, elderly individuals, low-income persons, and other transportation disadvantaged populations. The Passenger Transportation Plan should be consulted to better understand specific coordination efforts underway.

Nodes + Corridors Initiative

As proposed in The Tomorrow Plan, the region should develop a system of vibrant, walkable employment and residential nodes dispersed throughout Greater Des Moines and connected to one another by multimodal corridors. Developing nodes can increase employment opportunities, housing options, and overall community health and services near key neighborhoods while leaving neighborhood character intact. Over the last few decades, development in the region has been predominantly auto-oriented. This has resulted in a transportation system that has benefited the region through reduced congestion and travel times. However, this development leads to limited housing and transportation options. Projections show a population of approximately 750,000 people in Greater Des Moines by the year 2050. This means that around 250,000 additional people will call the region home over the next forty years and that Greater Des Moines will need nearly 150,000 new housing units by 2050.

Anticipated changes in the demographics of the region also show that future residents will demand a greater range of living options resulting from both different lifestyle preferences and the escalating costs of private automobile travel. How the region grows to accommodate these additional people will be a major factor in the future success of the region's economic, environmental, and social characteristics.

Focusing redevelopment in certain areas and connecting those areas furthers all aspects of sustainability:

- Targeting specific nodes throughout the region allows developers and local governments to use existing infrastructure, thereby reducing the need for costly infrastructure expansion and minimizing the costs to taxpayers that growth often creates;
- Developing mixed-use, mid-rise (two to five story) buildings at targeted nodes and corridors substantially increases the tax base of local communities;
- Building mixed-use, mid-rise developments helps support the maintenance of aging infrastructure through increased revenue;
- Creating a mixed-use, walkable environment at nodes and along corridors helps reduce vehicle miles traveled (VMT), improves air quality, and supports lifestyles that are more active.
- Use of these nodes and corridors allows existing residential neighborhoods to remain relatively unchanged while increasing the diversity of housing options across the region;
- Focusing these nodes and corridors on employment, commercial uses, and residential activity makes it easier for DART and others to provide multimodal transportation options.; and,
- Increasing fuel/transportation costs will make these nodes and corridors increasingly attractive over the coming decades and will help promote the region's competitive edge.

Implementing the following actions can help achieve this strategy:

- Work with communities to identify areas that are potential candidates for development/redevelopment as walkable nodes and corridors.
- Target street improvements at identified nodes/corridors to create a more pedestrian-oriented environment. These improvements can include narrowing travel lanes, reducing speed limits, installing planted medians, adding on-street parking, widening sidewalks, and planting street trees along medians and sidewalk.
- Develop model form-based code and transit-oriented development overlays for the proposed nodes and corridors to make sure communities achieve vibrant, mixed-use, walkable environments.

Additional design recommendations for implementing the nodes + corridors initiative can be found in Chapter 5.

Complete Streets Policy

The MPO and its member communities should develop and adopt Complete Streets policies, complemented by roadway design standards. Complete Streets are roadways designed to safely and comfortably accommodate all users, of all ages and abilities, including but not limited to motorists, cyclists, pedestrians, transit users, school bus riders, delivery and service personnel, freight haulers, and emergency responders.

Building complete streets provides many benefits to residents, business owners, developers, and the community as a whole. First and foremost, embracing the complete streets concept will help create balanced transportation systems by providing accessible, safe, and efficient connections between destinations. It will bolster economic growth and stability while increasing property values. It will enhance job growth, improve safety, improve public health and fitness, reduce harmful emissions, and reduce the overall demand on our roadways by allowing people to replace motor vehicle trips with active transportation options. Secondly, integrating sidewalks, bike facilities, transit amenities, and safe crossings into the initial design of a project spares the expense and complications of retrofits implemented at a later date. Thirdly, proactively planning for a multimodal transportation system can promote its integration with land use policies to encourage sustainable development.

MPO Complete Streets Policy

A MPO Complete Streets Policy should be adopted to create a safe, balanced, and effective transportation system where every roadway user can travel safely and comfortably and where multi-modal transportation options are available to everyone. The policy would encourage projects funded with STP and TAP funds within the MPO Planning Area Boundary, including all roadway and/or intersection reconstruction projects, added travel lane(s) projects, new roadways, and new or rehabilitated bridges (including bridge decks reconstructed over the Interstate and underpasses under reconstructed/new interchanges), to consider complete streets principles.

Applicable projects under this policy would be required to include at least:

- A continuous ADA-compliant sidewalk on one side of the roadway/bridge, or
- Designated on-street bicycle facility within the roadway project, if the inclusion of a sidewalk is anticipated to be overly burdensome to the project and therefore infeasible, or
- A multi-use trail of a sufficient width to accommodate both pedestrian and bicycle travel simultaneously.

Projects located along corridors already served by a continuous sidewalk or multi-use trail on at least one side of the roadway would be considered to be compliant. Improvements to ensure good condition and ADA compliance are encouraged. If designated on-street bicycle facilities are included, the design for their width, markings, and treatment at intersections and crossings should follow the design guidance of the National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide, found online at <http://nacto.org/cities-for-cycling/design-guide/>.

If the planned facility currently has fixed route transit, or is proposed to have fixed route transit in the Long Range Transportation Plan, then the project sponsor would be required request comments from the local transit agency (DART) during the project development process to ensure that collaboration occurs with these agencies and that accommodation of transit vehicles and opportunities to access transit facilities are provided.

While the MPO policy should strive for maximum integration of complete street principles, it should also allow for flexibility in certain cases. An exemption process should be included to navigate these situations.

A proposed MPO Complete Street Policy, as well as recommended street design criteria, can be found in Chapter 5.

Community Complete Streets Policy

All communities in the metropolitan area are encouraged to adopt complete streets policies at the city or county level to help ensure complete street principles are considered by all transportation projects – not just those built with federal funds. To date, the City of Des Moines and the City of Carlisle have adopted Complete Streets policies. Chapter 5 includes a sample policy for communities to consider.

Environmental Resiliency

As the Greater Des Moines area grows it will be faced with the challenge of how to do so in a way that limits the impact to sensitive environmental areas. The information below outlines best practices the region can embrace to ensure the transportation system can help avoid, minimize, or mitigate negative impacts to the environment.

Floodplain Management

Greater Des Moines has seen significant damage from floods. The adoption of a floodplain management policy can help the region prepare for more extreme weather events that cause flooding and increase water flow along creeks and rivers. Floodplains provide beneficial natural functions essential for water resources, wildlife habitat, and human interaction. Some of these functions include temporarily storing flood waters; filtering sediments and nutrients to improve water quality; recharging the groundwater supply; supporting natural vegetation that reduces soil erosion; and, providing fish and wildlife habitat. A floodplain management policy should consider and protect these functions.

No Adverse Impact (NAI) Floodplain Management is an approach that ensures the actions of any community or property owner, public or private, do not adversely impact the property and rights of others while protecting natural and beneficial functions of floodplains. An adverse impact can be measured by an increase in flood stages, flood velocity, flows, the potential for erosion and sedimentation, degradation of water quality, or increased cost of public services. NAI promotes responsible floodplain development through community-based decision making. Principles of NAI include:

- Prevent the worsening of flooding and increase flood peaks / stages
- Avoid diverting flood waters onto other properties
- Prevent reducing the size of natural channel and overbank conveyance areas
- Prevent altered water velocities
- Prevent increased erosion and sedimentation
- Prevent filling in floodplain storage areas
- Reduce the community's liability

Implementing NAI principles when planning roads can result in cost savings over time due to reduced infrastructure damage. The MPO encourages local community to integrate NAI principles in the development of the community's transportation system and comprehensive plan in order to manage development that identifies acceptable levels of impact, specifies appropriate measures to mitigate adverse impacts, and establishes a plan for implementation.

Green Streets

Streets are the largest single category of public impervious cover, accounting for roughly 32% of the impervious cover within the MPO area. To mitigate the impact of this impervious area, the MPO recommends adoption of green streets to provide stormwater management, while maintaining the primary function of the street for vehicles and pedestrians. The MPO encourages the implementation of green streets where appropriate throughout the metro's right-of-ways, public streets and sidewalks to maximize water quality improvement opportunities.

Urbanization has altered the natural landscape and affected the hydrologic cycle. Where the natural hydrologic cycle maintains a balance of water circulation through evaporation, precipitation, infiltration/groundwater recharge, and absorption and transpiration by plants, urbanization has resulted in an altered hydrologic cycle through construction of impervious surfaces such as buildings, roads and parking lots. The amount of groundwater recharge has been reduced while the volume and rate of runoff has been increased.

A green street uses a combination of vegetated and engineered strategies to manage rain or melting snow, (stormwater runoff), at its source. Green street designs incorporate various green stormwater infrastructure tools, including stormwater tree trenches, stormwater planters, stormwater bumpouts, and pervious pavement. Using these tools, a green street captures stormwater runoff from streets and sidewalks, infiltrates it into the soil to recharge groundwater and surface water, reduces the amount of polluted stormwater runoff going into the sewer system, carbon sequestration and serves as an urban greenway segment that connects neighborhoods, parks, recreation facilities, schools, mainstreets, and wildlife habitats. In addition, green streets can be combined with complete street designs to improve pedestrian and bicycle safety, improve air quality and enhance the aesthetics of the right-of-way. Green Streets can foster unique and attractive streetscapes that protect and enhance neighborhood livability and integrate, rather than separate, the built and natural environments.

Electric Vehicle Readiness

The future of transportation is in a fundamental shift to cleaner, more efficient fuels. Energy consumption affects air quality and impacts global climate as a result of emissions. The Tomorrow Plan recommended a strategy of promoting the use of renewable energy and

reduced energy consumption. One of the more efficient and sustainable fuels is that of electric drive systems. Des Moines area cities and counties can play a critical role in promoting strategies to decrease transportation related greenhouse gas emissions through the deployment of both public and private charging infrastructure. Given this, the MPO has identified three main recommendations for municipal governments to support the next steps in early adoption of electric vehicles for private use in the metro area:

- Take the lead in the installation of publicly sited electric vehicle supply equipment
- Incentivize local installation of electric vehicle supply equipment at the workplace and multi-unit residential facilities
- Integrate electric vehicle infrastructure into comprehensive plans

Natural Areas Map

The Natural Areas Map is a tool to provide local communities, developers and regional infrastructure providers the data to make informed quality growth and conservation decisions. The Natural Areas Map provides planners with a wide variety of data in order to develop the best possible scenario for development by understanding resources and challenges for a given location. The MPO invites communities to use the Natural Areas Map to help make informed decisions regarding actions that affect our region's resources.

Parking Management

The provision and management of parking play an enormous role in the look and feel of streets, traveler mode choice, and congestion levels. Parking spaces are a valuable commodity; like any commodity, they are subject to the laws of supply and demand. Typically, however, parking has been supplied without much thought to actual demand — or demand for any form of parking other than free parking — resulting in swathes of real estate being reduced to asphalt that sits largely empty for much of the day.

The concept of parking management starts from the understanding that the conventional approach has resulted in too much asphalt and distorted transportation markets, which make it almost impossible to run efficient transit systems or to simply walk or ride a bike safely across much of the country. This approach must be shifted to strategies that acknowledge the true costs of accommodating driving at the expense of alternate modes.

On-street parking and municipal parking lots and garages typically represent just a small portion of the overall supply of parking in any community. These spaces, however, tend to have an outsized impact on travel behavior and traffic impacts. These spaces are usually found downtown, or in other significant commercial centers, and tend to include the most popular parking options in these areas. This is particularly true of on-street spaces, which, more often than not, include the space that is closest to the front door of any given driver's destination. The following overarching principles should guide parking policy and implementation.

- Manage supply as a comprehensive system. On-street, off-street, public, and private resources should be managed collectively. Standardizing pricing and payment mechanisms makes the system easier to understand for the user.
- Share parking. Most parking is sized to cater to a single use or business, resulting in oversized lots. The customer wants to be assured of a parking space; whether that space is in front of the destination or 50 feet to one side in front of a different retailer makes no difference. In mixed-use areas, different land uses have different peak periods; thus, shared parking accommodates peaks for both uses.
- Use parking as a tool to manage congestion. Each parking space encourages at least one trip on the region's roads; thus, managing parking is a powerful way of controlling congestion.
- Incorporate good design. Zoning codes can include design standards for parking facilities to reduce parking garage blank walls and large parking lots in front of buildings, and to increase pedestrian access. Environmental innovations such as porous pavements can also be incorporated.

Parking management is not a one-size-fits-all technique. Strategies for suburban areas do not work in downtowns and vice versa. Rather than applying suburban parking requirements on mixed-use places, let the strengths and weaknesses of a location determine its parking supply. For instance, people are attracted to downtown mixed-use areas precisely because the streets are walkable and blocks compact; building parking lots in these places ruin their character.

Congestion Management

The MPO is required to have a Congestion Management Process that works in conjunction with the long-range transportation plan. A Congestion Management Process (CMP) is a systematic approach, collaboratively developed and implemented throughout a metropolitan region that provides for the safe and effective management and operation of new and existing transportation facilities through the use of demand reduction and operational management strategies. The MPO's current Congestion Management Process was adopted in 2013, but will need to be updated following adoption of Mobilizing Tomorrow.

A Congestion Management Process defines desired congestion-related performance targets for the region, methods for how to monitor the transportation system for changes in congestion, and strategies to address any areas of concern. Congestion management strategies can include operational improvements, growth management, and capital intensive strategies, which are described below. As noted in Chapter 2, the Greater Des Moines area does not currently observe high levels of congestion, nor is it forecast to see significant increases by 2050. However, when congested areas are present, it is recommended that the MPO's Congestion Management Process require the evaluation of all potential strategies, favoring lower cost operational solutions prior to pursuing higher-cost lane additions.

Operational Strategies

Operational management strategies are those that involve collaboration and coordination between transportation and public safety agencies. These strategies aim at improving service efficiency, enhancing public safety and security, reducing traveler delays, and improving access to information for travelers. Examples of operational improvements include the following:

- **Traffic Operational Improvements:** relatively small investments in time, money, and labor made at key locations, such as intersections. Examples include improves to traffic signalization, channelization, and highway geometrics;
- **Access Management:** established standards to driveway spacing and median openings;
- **Incident Management:** activities to help mitigate non-recurring congestion, such as rapid detection and response to accidents and stalled vehicles, provision of congestion-related information to drivers, management of construction and maintenance activities, and management of traffic for special events.
- **Intelligent Transportation Systems:** technology applications that provide user services such as travel planning, traveler information, emergency management, and advanced vehicle control.
- **Ramp Metering:** signals placed at freeway on-ramps to control the amount of traffic able to enter the flow of traffic.

Growth Management

As noted previously, the type and location development can impact transportation. Growth management refers to specific regulatory policies aimed at influencing how growth occurs. These policies affect density, availability of land, mixtures of uses, and timing of development, which can ultimately influence the type of transportation services needed. Local jurisdictions have control over growth in the MPO area and play a critical role in generation and management of congestion.

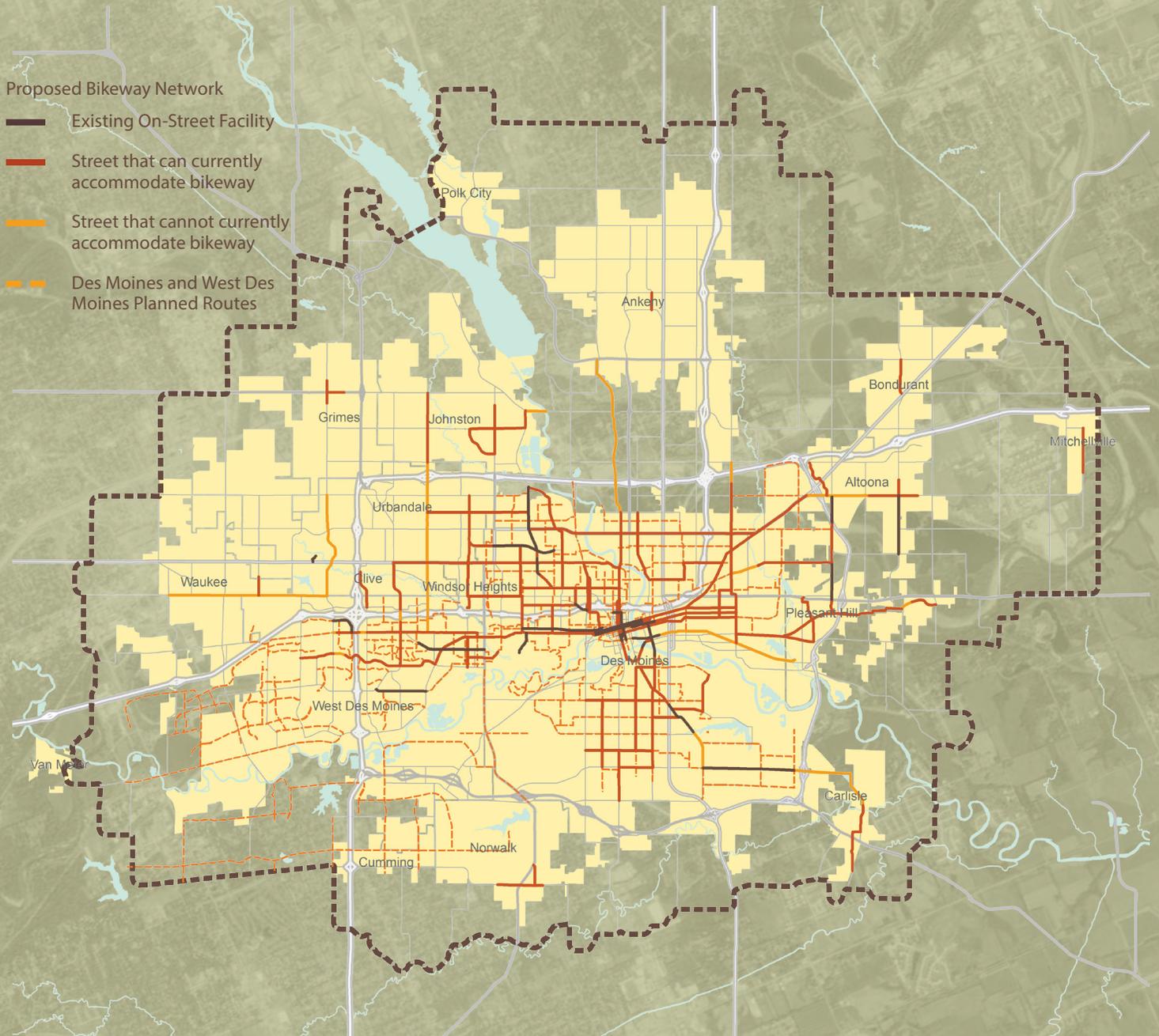
Capital Intensive Strategies

Capital intensive strategies include higher-cost additions to the roadway and transit systems. Lane additions are among the more common methods employed to address congestion. However, research indicates that these improvements typically produce only short-term benefits and may ultimately induce more traffic and, therefore, more congestion. Transit capital improvements is another strategy that may be employed, which includes procurement of additional transit vehicles and/or the implementation of new services.

Capital Projects

Beyond the policies that communities can adopt, the MPO annually funds capital projects that will enhance the regional transportation system. For a project to be eligible for this funding, it must be included in or be consistent with Mobilizing Tomorrow. As mentioned in Chapter 3, Investment Strategies, the MPO used an in-depth scoring process to determine which projects would most positively impact the region between now and 2050. The following section describes capital projects that would support this plan's goals and performance targets, as well as projects identified by partner agencies such as the Iowa DOT, DART, and the Des Moines International Airport.

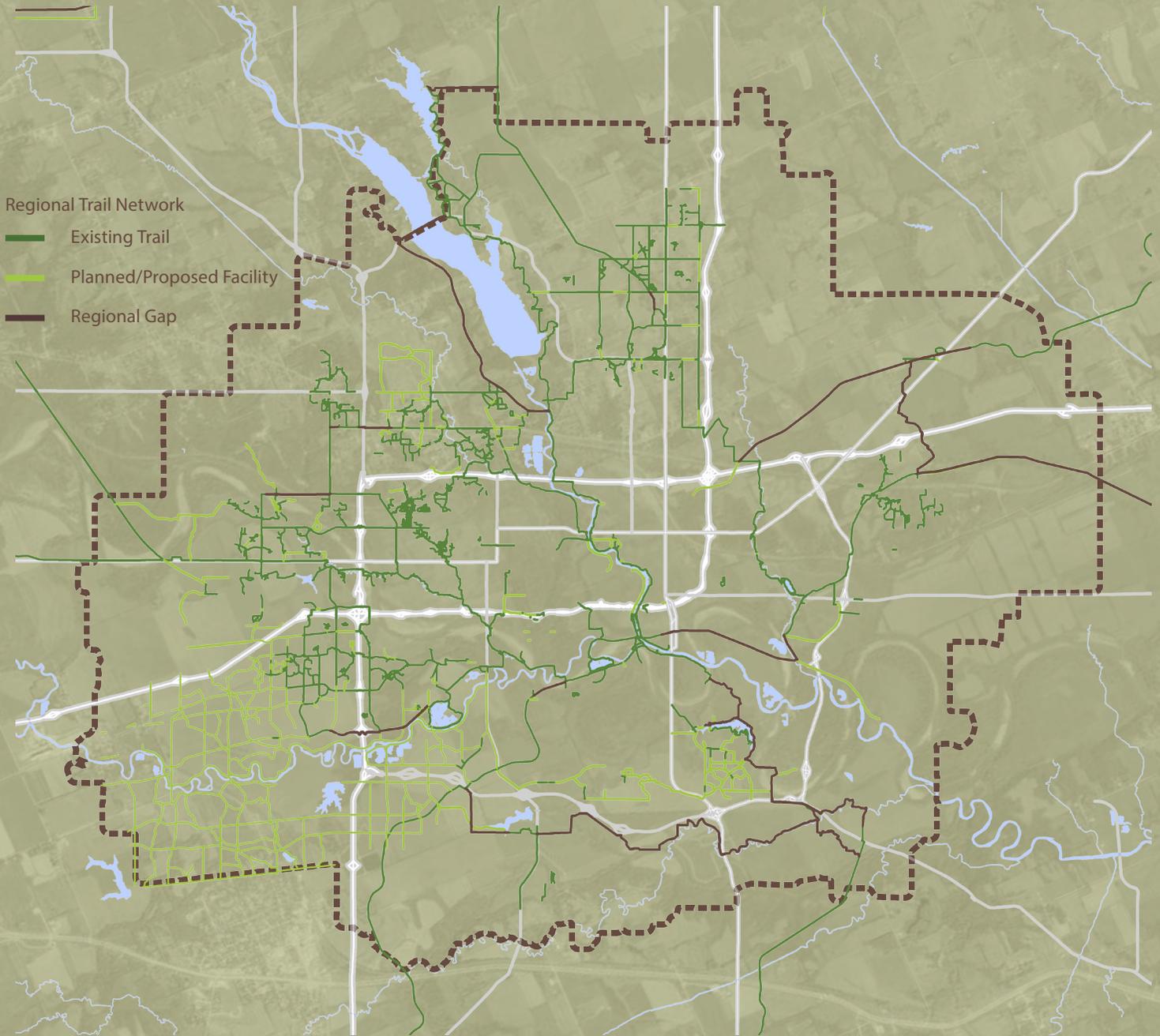
BIKE + PEDESTRIAN System



TO BUILD OUT THE PROPOSED BIKEWAY NETWORK, IT WOULD COST AN ESTIMATED

\$12-20 MILLION

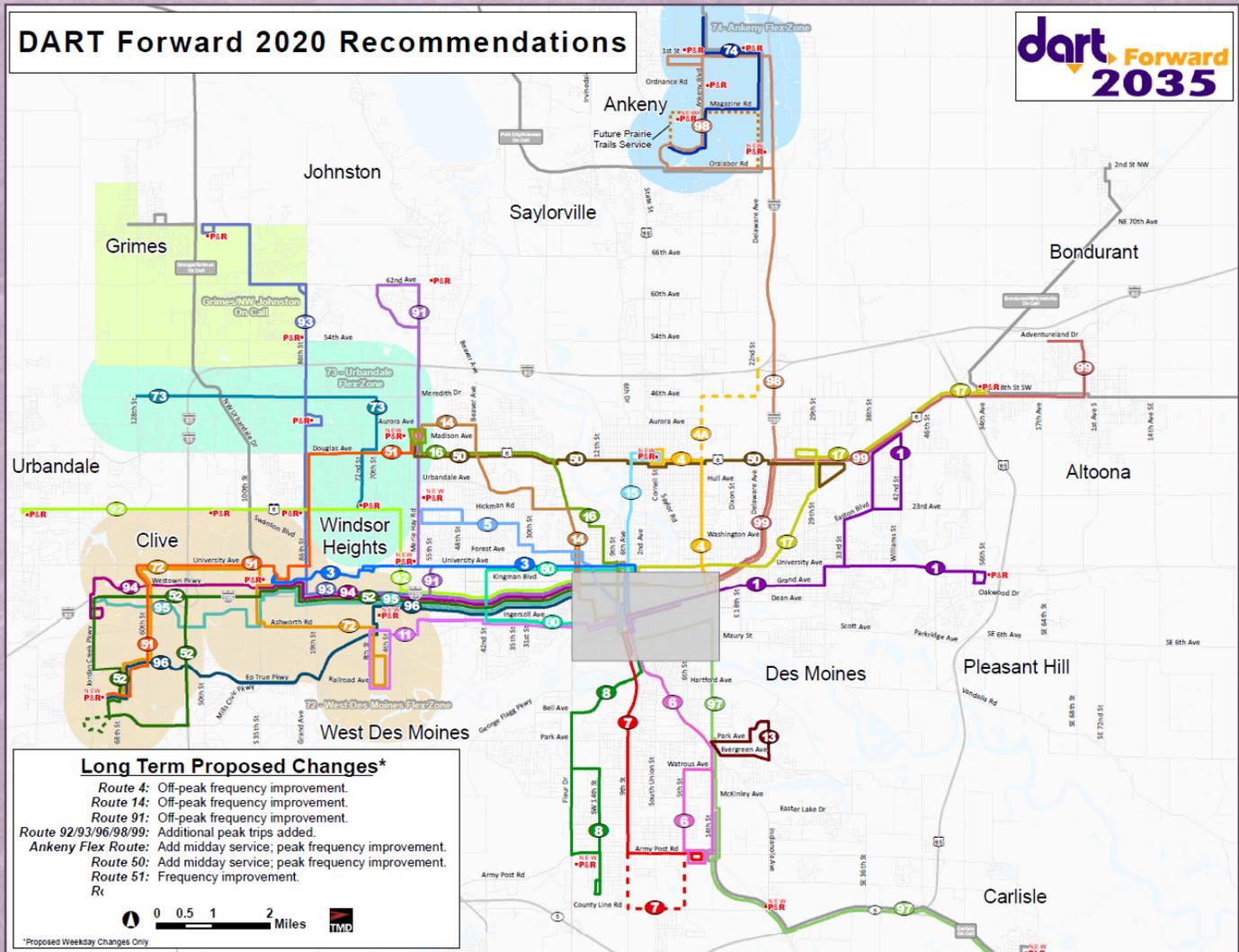
As discussed in Chapter 3, the MPO receives TAP funds annually. With these TAP funds, the MPO will target bicycle and pedestrian projects. To help achieve performance targets, the MPO should prioritize the completion of identified trail gaps and the implementation of on-street bicycle facilities. Other eligible uses of TAP funds are streetscape projects, safe route to schools projects, and other projects eligible for TAP funds per US Code.



\$27 MILLION

IS THE AMOUNT IT WOULD TAKE TO FILL IN ALL
REGIONAL GAPS

PUBLIC Transportation

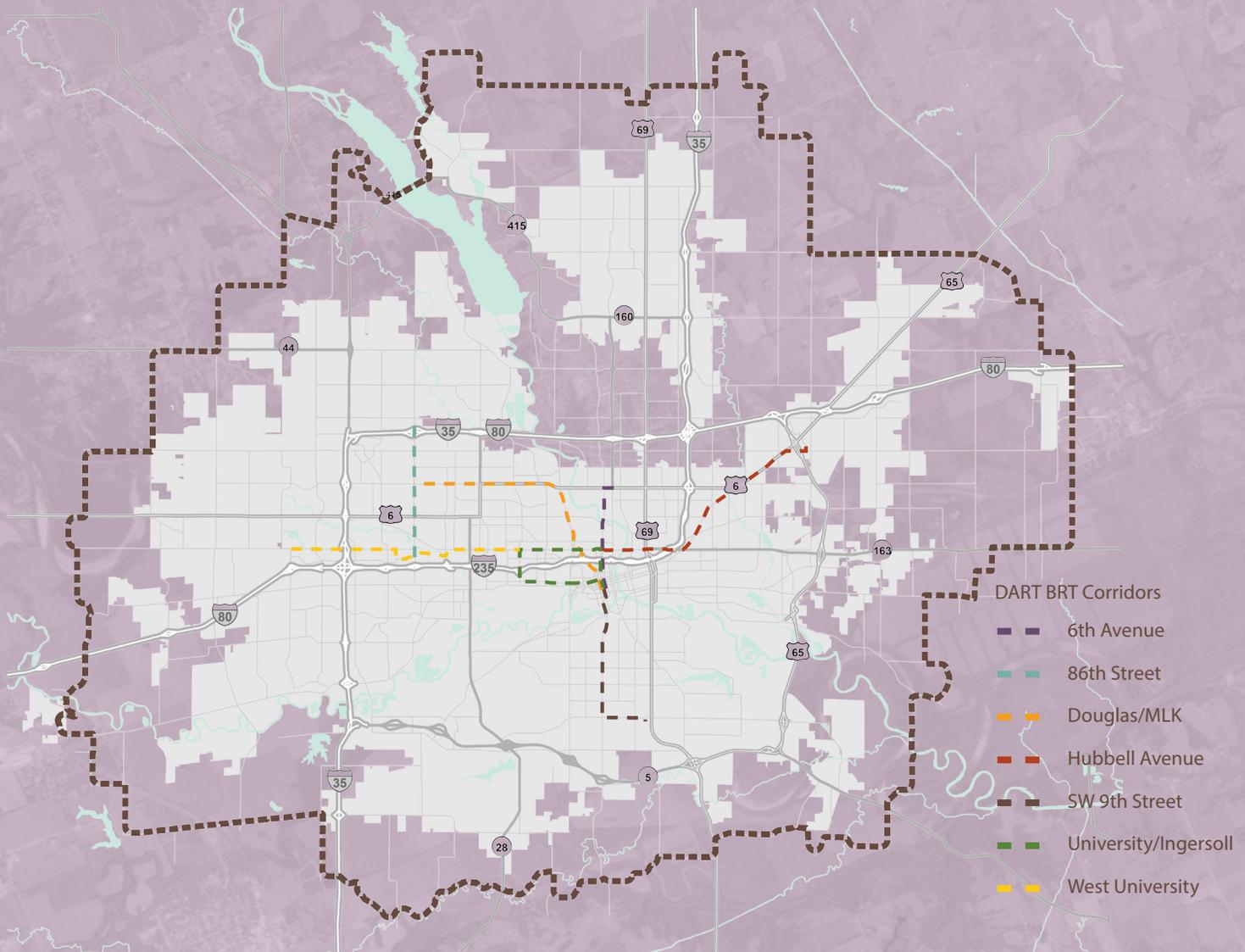


EXPANDED SERVICES

DART Forward 2035 identifies numerous services improvements to be implemented in the coming years. Implementation of the plan began in 2012 and include improvements to service frequency as well as the introduction of new routes.

Appendix E includes a detailed list of projects DART plans to carry out to expand services, as well as to maintain its existing fleet and operations.

DART Forward 2035 identifies numerous services improvements and capital needs necessary to improve the public transportation system. The MPO will aide in this effort by providing at least 15 percent of its STP funding to transit activities, such as vehicle purchases and other capital projects. Additional information about DART Forward 2035 is available at <http://ridedart.com/media/dart-forward-2035-plan>.

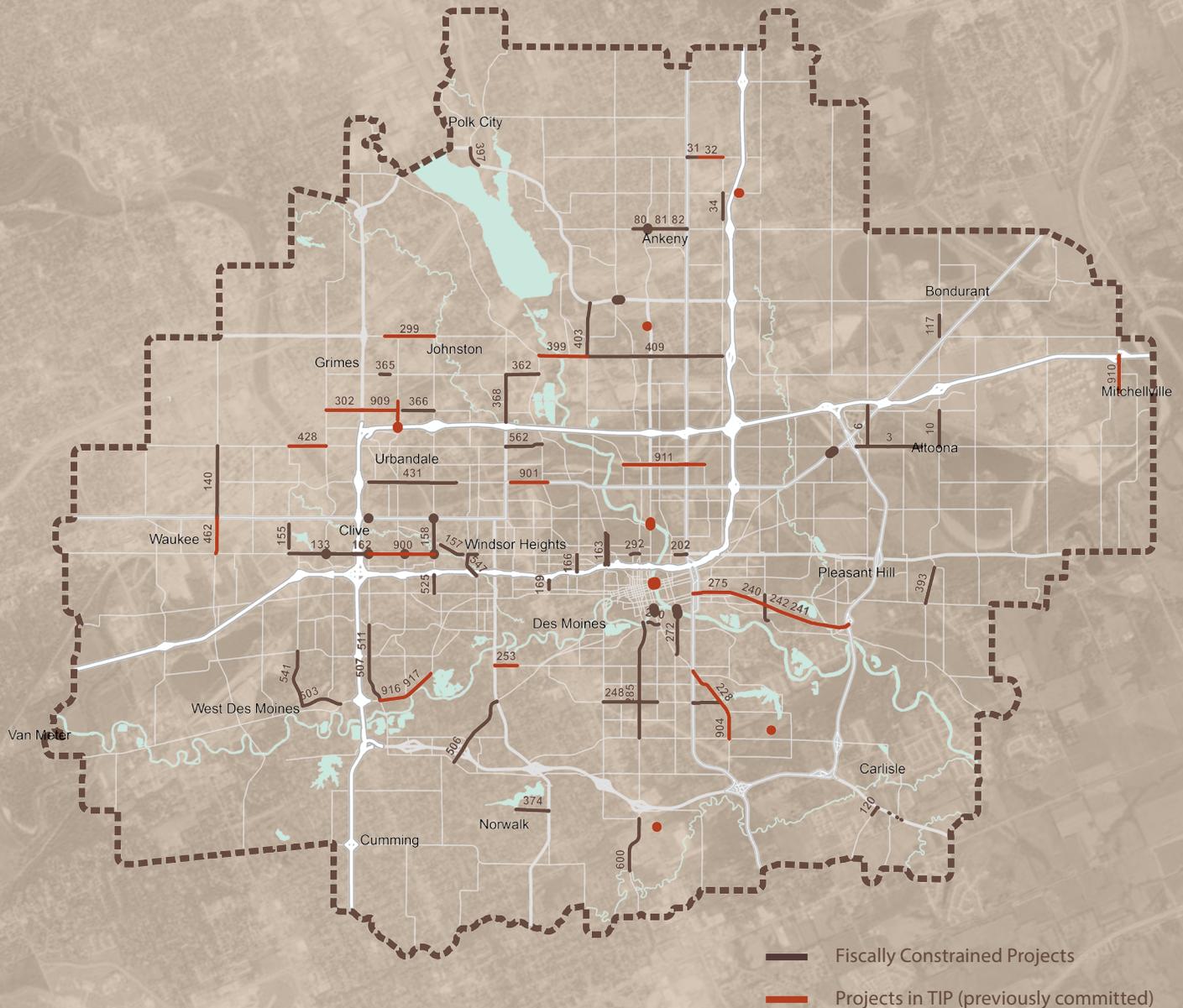


LOCALLY PREFERRED ALTERNATIVE

DART has administered an Alternatives Analysis that complies with the FTA's requirement for New Starts funding. An Alternatives Analysis is the first step in the planning process needed to be able to use Federal funds for a transit project's construction. The Alternatives Analysis examined a number of modal alternatives, including a no-build alternative, enhanced express bus service, and Bus Rapid Transit (BRT) in the University/Ingersoll Corridor, as illustrated in the above map. Based on the results of the study, BRT is the locally preferred alternative. DART plans to begin BRT service on the University/Ingersoll Corridor (Route 60) by 2020, pending FTA New Starts funding, followed by BRT service on Southwest 9th, 6th Avenue, and Douglas/MLK by 2035. See Appendix E for a full list of BRT projects and anticipated years.

STREETS + Highways

MPO'S FISCALLY CONSTRAINED PROJECTS

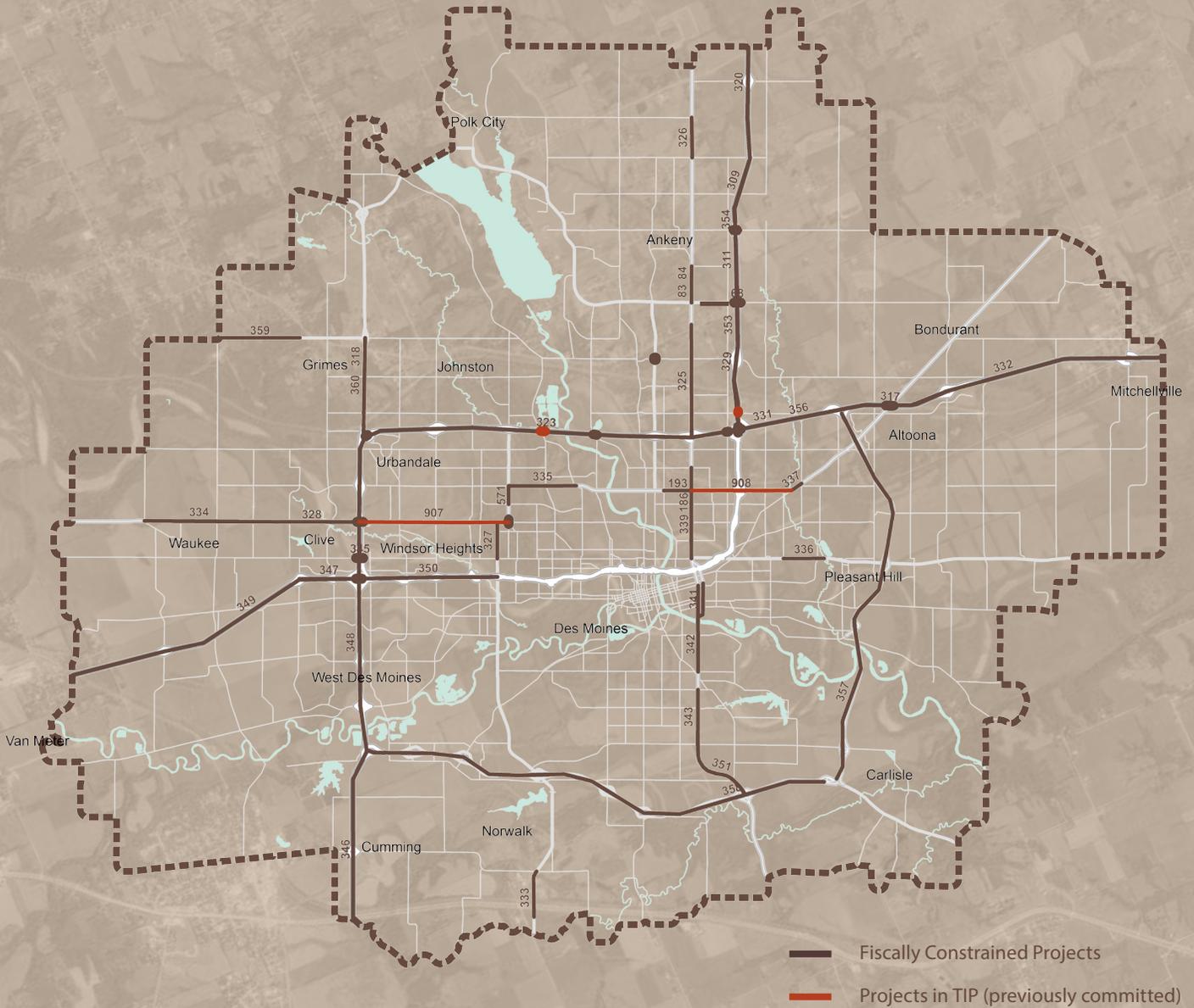


Fiscally constrained projects include each MPO member community's top priority, as well as regionally-significant projects that performed the best using project evaluation criteria.

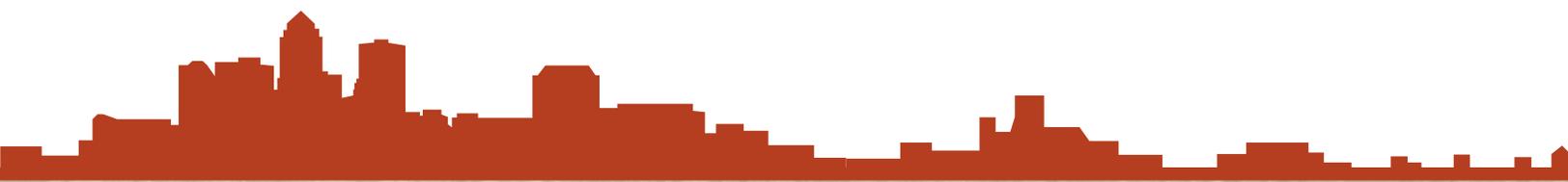
A full list of constrained and illustrative projects are included in Appendix E.

The MPO's member governments, as well as the Iowa DOT, identified hundreds of roadway projects to help improve the region's transportation system. The MPO's fiscally-constrained list identifies projects that could be implemented with anticipated STP funds, as discussed in Chapter 3. The Iowa DOT's fiscally-constrained list identifies projects within the MPO planning area that the Iowa DOT could include implement using its anticipated state and federal funds.

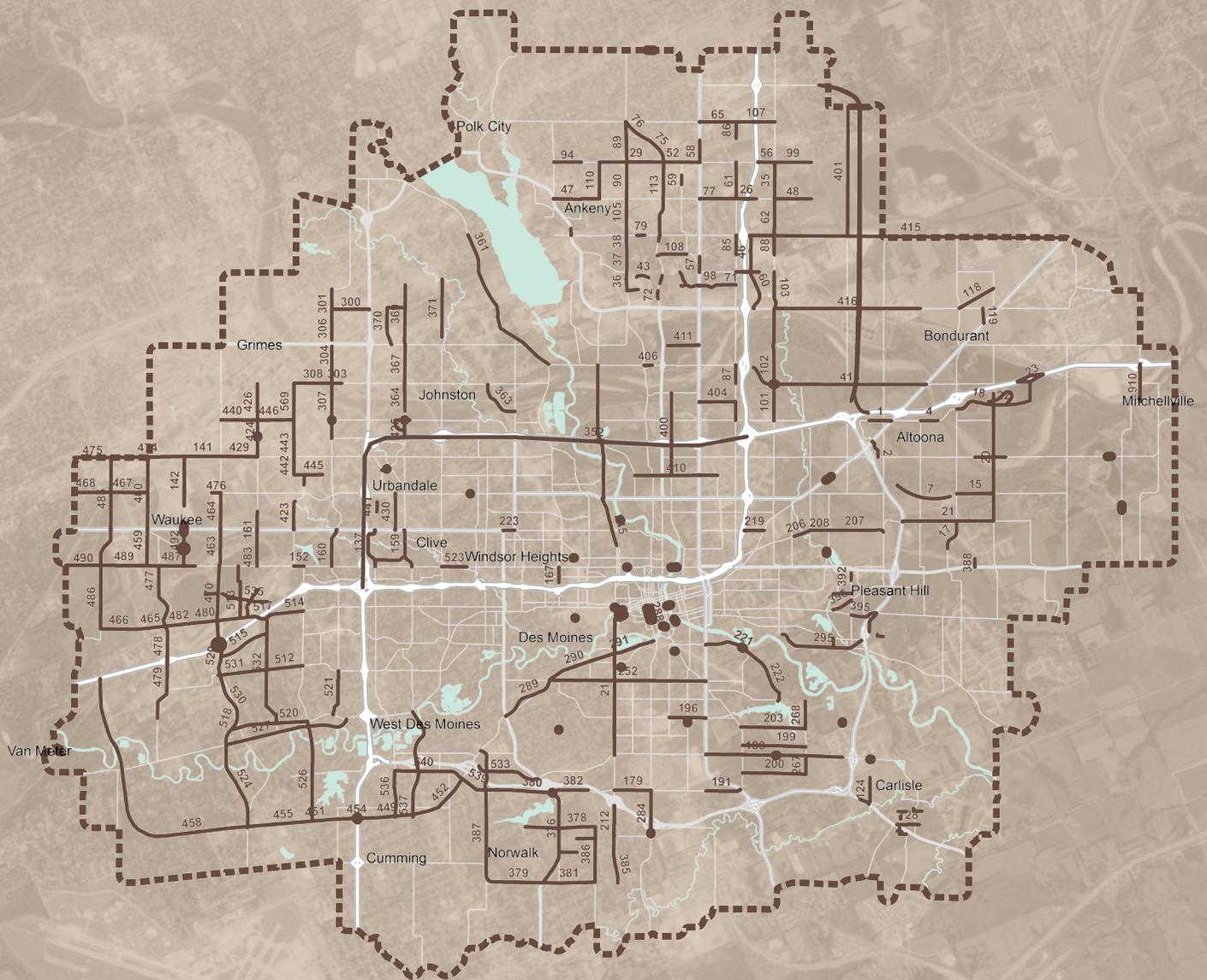
IOWA DOT'S FISCALLY CONSTRAINED PROJECTS



STREETS + Highways



ILLUSTRATIVE PROJECTS





TOTAL COSTS OF SUBMITTED
PROJECTS OUTWEIGHED
ANTICIPATED REVENUES BY NEARLY

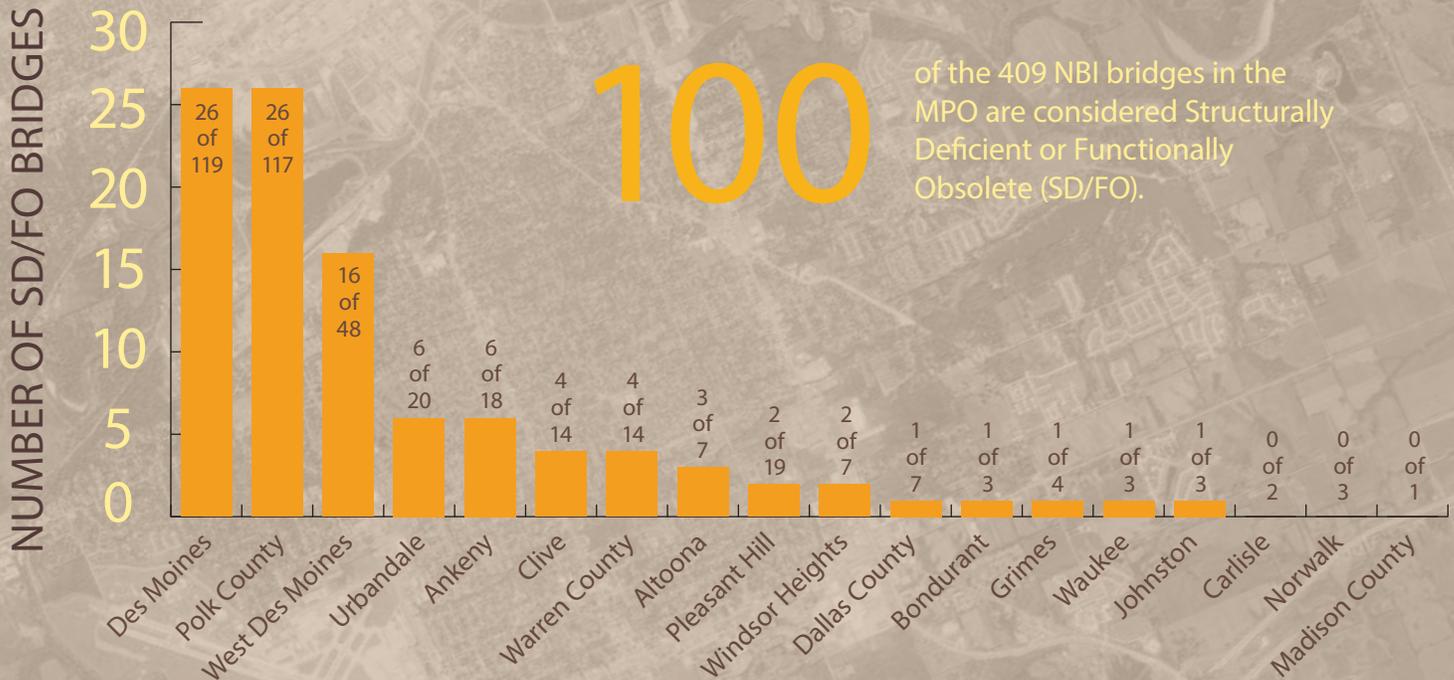
\$1.6 BILLION

SYSTEM Maintenance

BRIDGE FUNDS

The MPO will set aside at least 15% of its STP funds to create a new Bridge Program. This program will be modeled after the Iowa DOT's City Bridge Program. Bridges must be classified as structurally deficient or functionally obsolete to be eligible for funds. Bridges with the lowest sufficiency rating will be prioritized.

15 PERCENT OR MORE OF STP FUNDS TO BRIDGES



Nearly all MPO member communities have bridge projects that would qualify for STP Bridge funds. Bridge condition information is updated regularly, and the MPO will use the latest information when making a decision on which bridges to fund.

Maintenance of the current transportation system is of critical importance to the MPO. While some maintenance projects are included in the roadway projects submitted by MPO member governments and the Iowa DOT, the MPO will set aside at least 25 percent of its funds for maintenance-related activities.



10

PERCENT OR MORE
OF STP FUNDS TO
PRESERVATION

PRESERVATION FUNDS

The MPO will set aside at least 10% of its STP funds for projects that maintain and preserve the transportation system. These projects typically will include non-capacity projects such as overlays and full-depth reconstruction. These projects will be identified on an annual basis using the latest condition information available. However, communities must be able to demonstrate that they are not solely relying on MPO STP funds for their maintenance needs.

\$40

MILLION FOR
MAINTENANCE
ANNUALLY

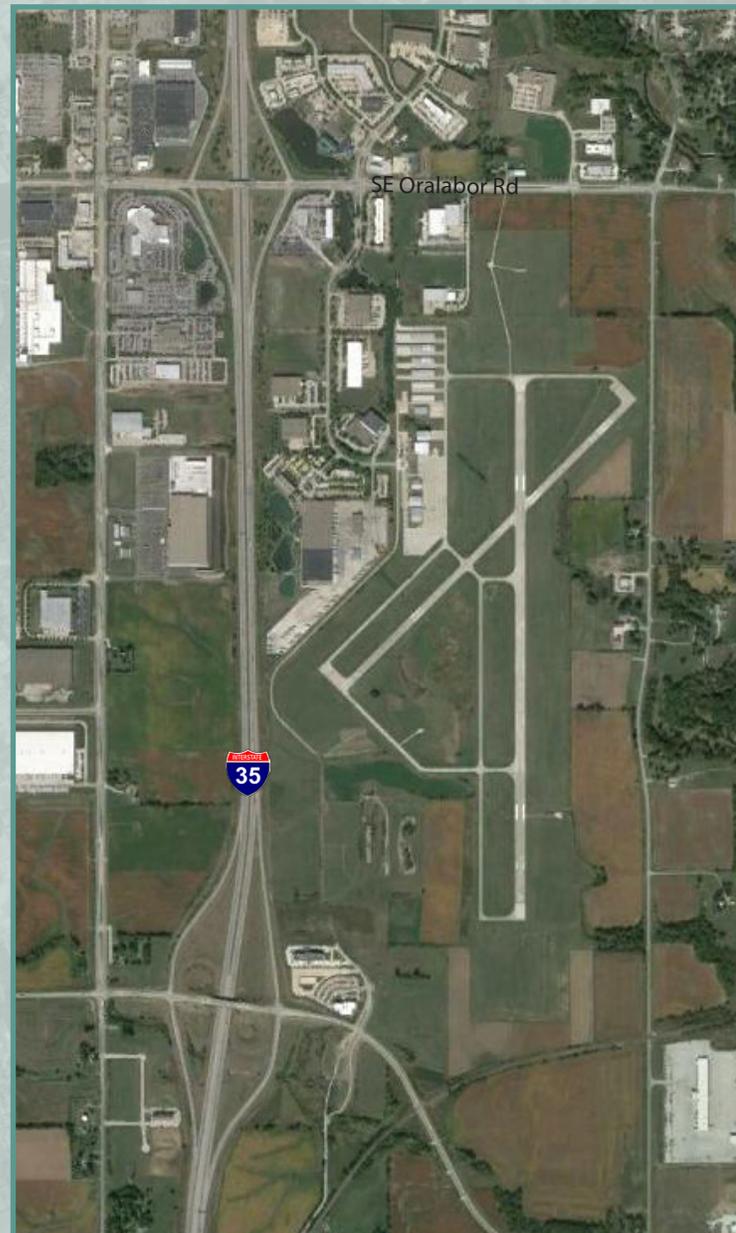
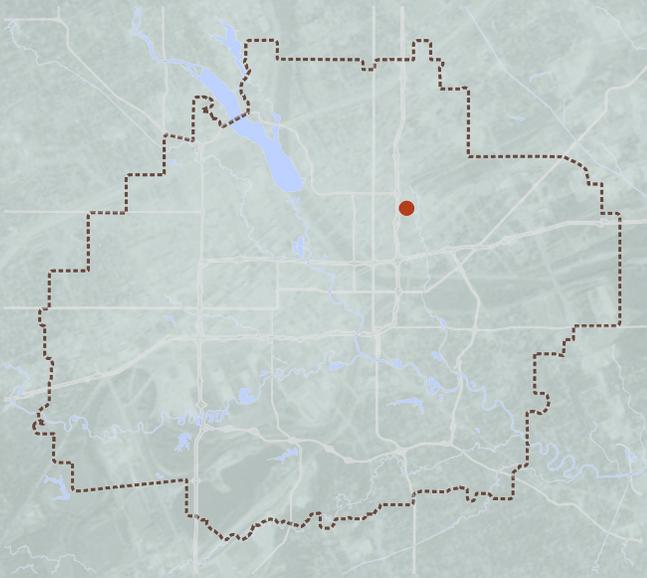
MAINTENANCE INVESTMENT

To achieve the MPO's target of maintaining no more than 18% of roadways in poor or very poor condition, the region would need to invest \$40 million annually in maintenance. Currently, the region spends only \$30 million in maintenance. The MPO calls on its member governments to be proactive in maintaining a state of good repair with their local funds.

AVIATION

ANKENY REGIONAL AIRPORT

The Ankeny Regional Airport (IKV) is considered an Enhanced Service Facility that provides general aviation needs for the Des Moines region as a business airport and as a reliever to the Des Moines International Airport. The IKV is owned and operated by the Polk County Aviation Authority and accounts for personal and business travel, as well as just-in-time shipping, law enforcement, agriculture, and medical transport.



The Des Moines region is served by seven airports, including two public airports and five general private airfields. The following section will focus on the two principal airports in the MPO planning area - the Des Moines International Airport and the Ankeny Regional Airport. The Iowa DOT's Iowa Aviation System Plan 2010-2030 includes individual airport summaries for Iowa airports.

DEVELOPMENT NEEDS + OTHER POTENTIAL PROJECTS

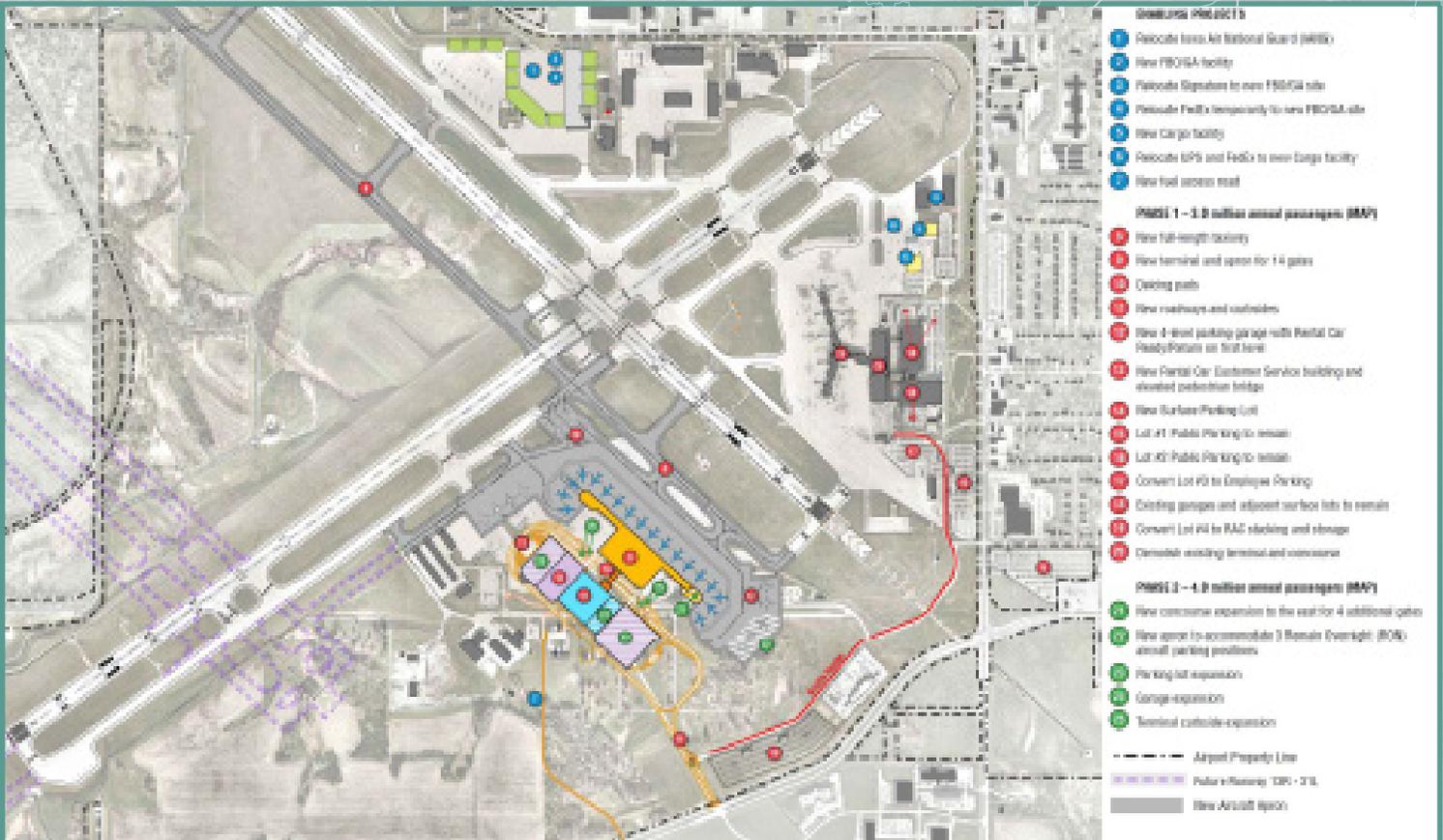
PROJECT DESCRIPTION	FUNDING NEEDED
2011-2030 Development Needs	
Airport Layout Plan (ALP) updates (2013, 2021, 2029)	\$1,350,000
Total	\$1,350,000
2011-2030 Other Potential Projects	
Land acquisition for Runway 22 runway protection zones, object free area, and runway safety area	\$5,339,038
Relocate NE 29th St, relocate Runway 22 threshold	\$850,000
Replace AWOS equipment	\$131,580
Rehabilitate Runway 4/22	\$201,425
Rehabilitate taxiway	\$107,737
Acquire a 4x4 truck with dump box and blade	\$130,000
Replace MIRL with HIRL system	\$506,220
Install Runway 36 MALSR	\$900,000
Construct airport access road (Phase I) - Corporate Woods Business development to south corporate apron area	\$230,168
Pave south corporate apron	\$1,050,000
South corporate apron - grade and drain	\$710,000
SRE equipment	\$150,000
Improve access road	\$982,998
SRE building	\$167,200
Land acquisition - Runway 18 extension	\$2,699,235
Runway 18 extension	\$724,000
Total	\$14,879,601

AVIATION

DES MOINES INTERNATIONAL AIRPORT

The City of Des Moines owns and operates Des Moines International Airport (DSM). The airport is governed by a five member Airport Authority Board, composed of representatives appointed by the Des Moines Mayor and approved by the Des Moines City Council. DSM serves as the major air passenger and airfreight service center for central Iowa. In addition, DSM serves as a base for the Iowa Air National Guard.

Future Plans — In April 2014, the Des Moines Airport Authority published the [Des Moines International Airport Terminal Area Concept Plan Technical Report](#). This report outlines the airport authority's plans to relocate and expand the terminal based on growing demand and inadequacies associated with the current terminal location and facilities. The preferred alternative identified in the study would cost approximately \$467 million in 2014 dollars. The figure below shows the layout of the proposed terminal development.



DES MOINES INTERNATIONAL CAPITAL IMPROVEMENT PROGRAM AND LONG-RANGE NEEDS ASSESSMENT

PROJECT DESCRIPTION	COST	YEAR
Reconstruct 4,100 feet of Runway 13/31 – D5 to Runway 5/23 Intersect	\$14,125,000	FY 2015
Rehabilitate Runway 13/31 + 5/23 Intersection	\$2,311,000	FY 2016
Airfield Lighting Vault	\$2,164,500	FY 2016
1,860 feet of Runway 13 Rehabilitation	\$1,389,900	FY 2017
2,220 feet of Runway 31 Rehabilitation	\$2,612,000	FY 2017
East GA Apron Rehabilitation Phase III	\$402,998	FY 2017
Engineering Analysis of Runway 5/23	\$350,000	FY 2017
Airfield Pavement Maintenance Program Update	\$120,000	FY 2018
Runway 5/23 Reconstruction - West of Intersection	\$6,305,000	FY 2018
Terminal Area Environmental Assessment	\$300,000	FY 2019
Runway 5/23 Reconstruction – East of Intersection	\$4,818,000	FY 2019
North Parallel Taxiway Grading	\$10,836,649	FY 2020
RTR Relocation	\$1,199,153	FY 2020
North Parallel Taxiway Paving and Lighting	\$21,633,144	FY 2021
South Parallel Taxiway Construction	\$16,273,366	FY 2022
Terminal Apron, Deicing Pad, Lighting	\$10,369,053	FY 2023
Terminal Apron and Deicing Pad	\$11,521,170	FY 2024
Total	\$107,730,933	

3.4%

FORECASTED ANNUAL GROWTH
RATE FOR ENPLANED PASSENGERS

RAIL

PASSENGER RAIL

The Iowa DOT has led efforts in recent years to study the feasibility of adding passenger rail service from Chicago to Omaha, via Des Moines. The MPO supports these efforts to expand passenger rail from Chicago to Des Moines. In July 2010, the MPO approved a feasibility study recommending a site for a future passenger rail station. This study recommended the former Chicago, Rock Island, and Pacific Railroad Depot on 4th Street in Downtown Des Moines as the preferred rail station location. This site has some remaining rail infrastructure and is adjacent to DART Central Station.

FREIGHT RAIL

The Des Moines area's location at crossroads of I-35 and I-80 – which connect the region to Canada, Mexico, the east and west coast's, and the Gulf of Mexico – provides the region with a global connection and thus the ability to simplify the process of importing or exporting. This crossroad location is attractive for transportation companies and is a desirable freight terminal location. In order for the region to ensure economic growth through enhanced transportation infrastructure the region should:

- Upgrade rail lines to handle heavier rail cars to improve overall freight capacity in the area;
- Develop rail-centric transportation options for businesses through development of a transload facility;
- Expand existing transportation options to attract new industries to the region; and,
- Maintain and upgrade rail crossings to improve safety.

DES MOINES RAIL TRANSLOAD FACILITY

The City of Des Moines Railport facility is proposed for location on City-owned property located in the southeast section of the City. The site is directly adjacent to East Martin Luther King Jr. Parkway, a major arterial roadway connecting west to the Central Business District in downtown Des Moines, and planned for connection to Iowa Highway 65 to the east, which provides connectivity to the Interstate system, I-35 and I-80.

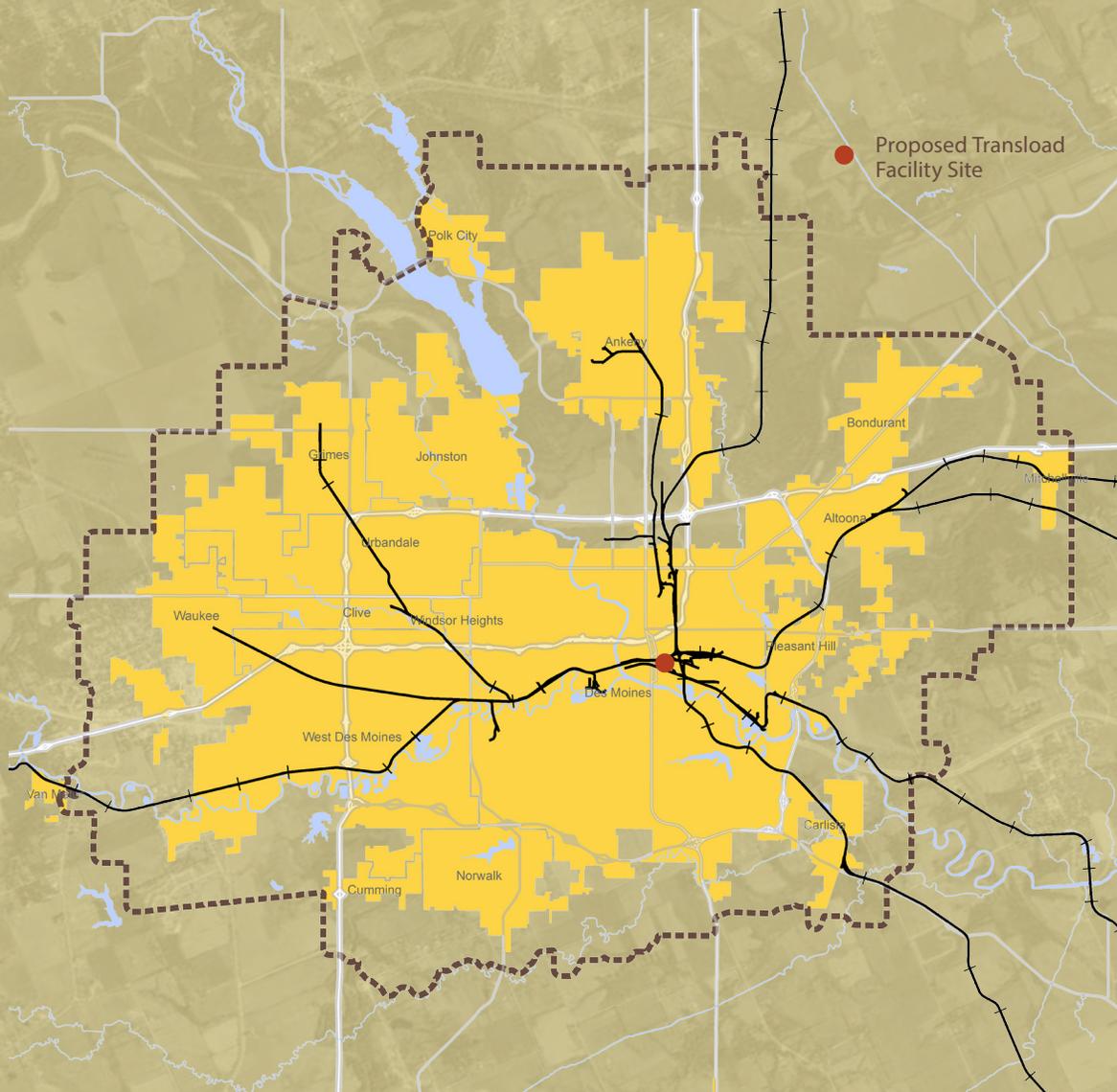
The preferred site is adjacent to a convergence of four rail lines, including three Class I railroads and one Class II railroad. The site's location offers both regional and national significance, providing a location for the transfer of goods from truck to rail in an environment that will maximize competitive benefits for users. The facility will strengthen the existing transportation and goods movement network in the region, and assist in connecting Central Iowa businesses to coastal ports at a national level.

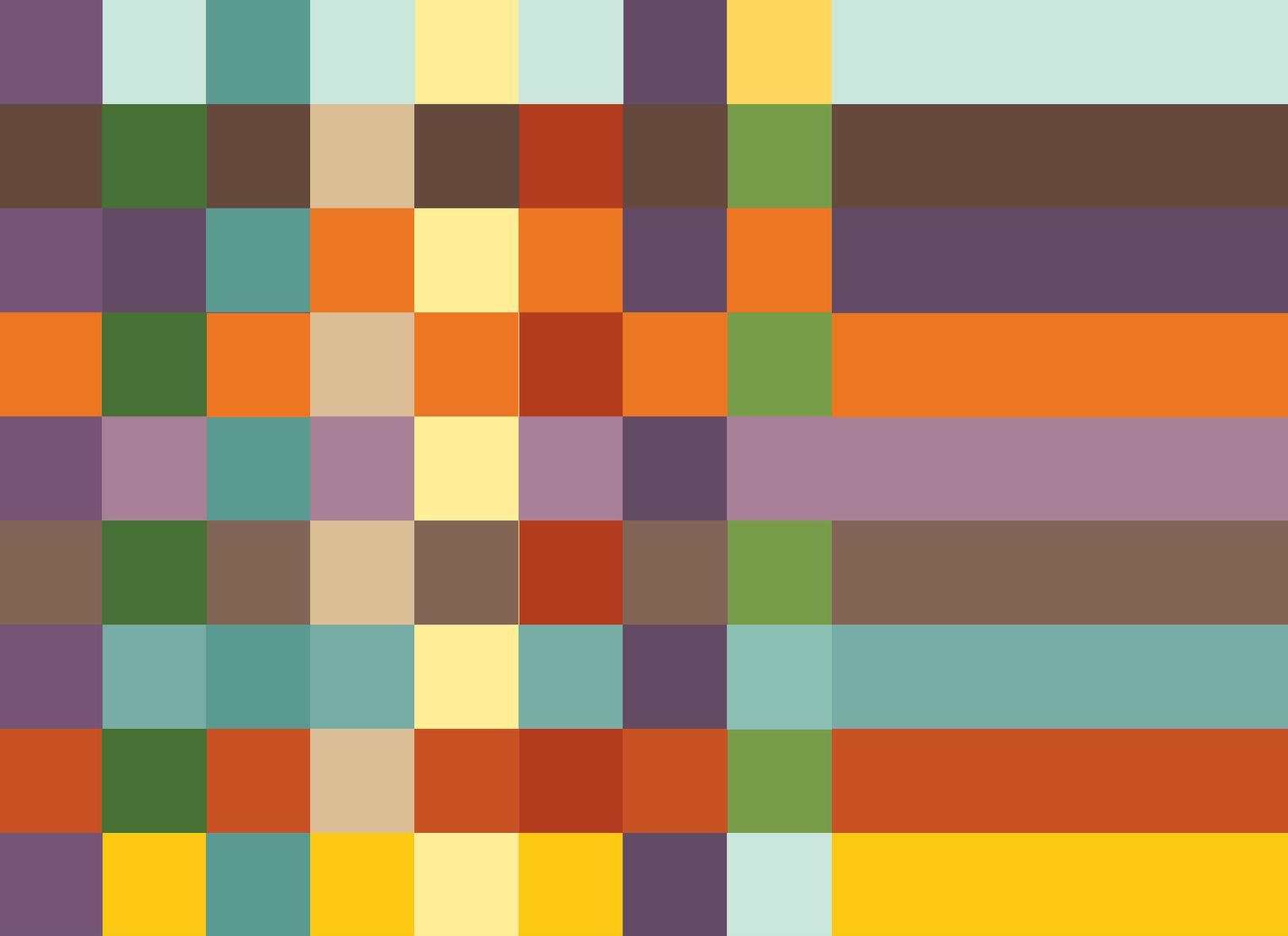
Anticipated users of the facility would include a wide variety of companies that handle a number of commodities: minerals, steel, chemicals, lumber, finished products, agricultural products, food, fertilizers, products for the development of Iowa's growing wind energy industry, roofing materials, pipe, sheet metal, pilings, beams, plastics, aggregates, salts, oils, green bio-products, generators, transformers, farm machinery, equipment, feed additives.

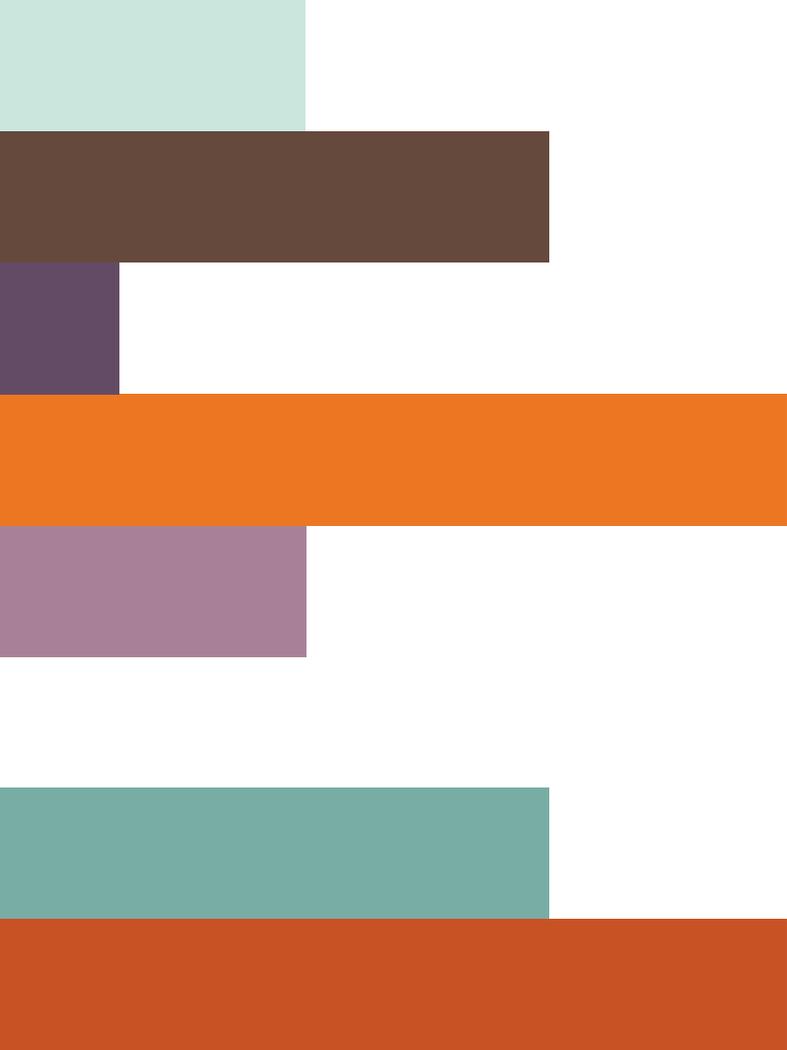
The Greater Des Moines region has taken a greater interest in rail transportation – both passenger and freight – in recent years. While it has little direct authority over rail issues, the MPO coordinates with railroad companies, the Iowa DOT, the Federal Rail Administration, Amtrak, and other stakeholders on efforts to expand both passenger and freight rail opportunities in its planning area.

The main existing challenges that the proposed facility would begin to address are the lack of large scale means to get goods onto rail in the market, removing truck traffic from congested roadways, provide more efficient and cost-effective goods movement to businesses, and reduce significant existing drayage costs required to move goods 2-5 hours from Des Moines to access rail service.

The estimated Phase I project costs for the facility are approximately \$8.3 million. This includes \$740,000 in development costs, \$2.1 million in site work, \$3.2 million in rail construction, and \$1.2 million in buildings and structures. The project also includes a 15 percent contingency of \$1.1 million.







5

TECHNICAL
RESOURCES

TECHNICAL RESOURCES

Chapter 4 introduced several strategies recommended for the MPO and/or its member governments to consider to help move the transportation system forward. This chapter includes more specific information about many of the policies discussed in Chapter 4. While Chapter 4 was written for policy makers and members of the public, Chapter 5 is written for planners, engineers, and other design professionals. Note that the information included in this section is for information purposes only. The MPO or its member governments would need to adopt the policies, guidelines, or standards included in this section for them to become mandatory.

This chapter includes the following information (click title to jump to section):

- [MPO Complete Streets Sample Policy](#)
- [Local Complete Streets Sample Policy](#)
- [Recommended Roadway Design Standards](#)
- [Recommended On-Street Bicycle Facility Standards](#)
- [Recommended Parking Guidelines](#)
- [Recommended Transit Supportive Development Guidelines](#)
- [Electric Vehicle Infrastructure Recommendations](#)

MPO Complete Streets Sample Policy

- 1.0 Defined
- 2.0 Introduction/Justification
- 3.0 Vision & Intent
- 4.0 Applicability
- 5.0 Design
- 6.0 Implementation
- 7.0 Evaluation / Performance Measures

1.0 Defined

Complete Streets are roadways designed to safely and comfortably accommodate all users, of all ages and abilities, including but not limited to motorists, cyclists, pedestrians, transit users, school bus riders, delivery and service personnel, freight haulers, and emergency responders.

Publicly owned rights of way should safely accommodate destination-based and recreational users, as well as provide opportunities as appropriate for rest and directional information within the public realm.

2.0 Introduction/Justification

Building complete streets provides many benefits to residents, business owners, developers, and the community as a whole. First and foremost, embracing the complete streets concept will help create balanced transportation systems by providing accessible, safe, and efficient connections between destinations. It will bolster economic growth and stability while increasing property values. It will enhance job growth, improve safety, improve public health and fitness, reduce harmful emissions, and reduce the overall demand on our roadways by allowing people to replace motor vehicle trips with active transportation options. Secondly, integrating sidewalks, bike facilities, transit amenities, and safe crossings into the initial design of a project spares the expense and complications of retrofits implemented at a later date. Thirdly, proactively planning for a multimodal transportation system can promote its integration with land use policies to encourage sustainable development.

The MPO Complete Streets policy also supports compliance with Federal policy [United States Code, Title 23, Chapter 2, Section 217 (23 USC 217)] requiring consideration for bicycling and walking within transportation infrastructure.

3.0 Vision & Intent

To create a safe, balanced, and effective transportation system where every roadway user can travel safely and comfortably and where multi-modal transportation options are available to everyone.

The goals of this Complete Streets Policy are:

1. To create a comprehensive, integrated, and connected transportation network that supports compact, sustainable development and provides livable communities.

2. To ensure safety, ease of use, and ease of transfer between modes for all users of the transportation system.
3. To provide flexibility for different types of streets, areas, and travelers to enhance the transportation experience.

4.0 Applicability

4.1 Jurisdiction

The recommendations and requirements within the Des Moines Area Metropolitan Planning Organization's (MPO) Complete Streets Policy are encouraged for all Surface Transportation Program (STP) and Transportation Alternatives Program (TAP) projects within the MPO Planning Area Boundary.

Applicable projects include all roadway and/or intersection reconstruction projects, added travel lane(s) projects, new roadways, and new or rehabilitated bridges (including bridge decks reconstructed over the Interstate and underpasses under reconstructed/new interchanges).

The MPO recognizes that some local jurisdictions have adopted their own Complete Streets Policies. When applied to the federally funded projects as listed above, the strictest regulations of any involved Complete Streets policy applicable to a jurisdiction shall apply. Local jurisdictions that have not adopted their own policies are strongly encouraged to do so.

4.2 Network Connectivity

Applicable projects under this policy will be required to include at least:

- A continuous ADA-compliant sidewalk on one side of the roadway/bridge, or
- Designated on-street bicycle facility within the roadway project, if the inclusion of a sidewalk is anticipated to be overly burdensome to the project and therefore infeasible, or
- A multi-use trail of a sufficient width to accommodate both pedestrian and bicycle travel simultaneously.

Projects located along corridors already served by a continuous sidewalk or multi-use trail on at least one side of the roadway are considered to be compliant. Improvements to ensure good condition and ADA compliance are encouraged. If designated on-street bicycle facilities are included, the design for their width, markings, and treatment at intersections and crossings should follow the design guidance of the National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide, found online at <http://nacto.org/cities-for-cycling/design-guide/>.

If the planned facility currently has fixed route transit, or is proposed to have fixed route transit in the Long Range Transportation Plan, then the project sponsor shall request comments from the local transit agency (DART) during the project development process to ensure that collaboration occurs with these agencies and that accommodation of transit vehicles and opportunities to access transit facilities are provided.

4.3 All Projects and Phases

Every federally funded transportation improvement and project phase should be approached as an opportunity to create safer, more accessible roadways for all users. Project phases include planning, programming, design, right-of-way acquisition, construction engineering, reconstruction, and operations as well as any change to transportation facilities within street rights-of-way such as capital improvements, re-channelization projects, and major maintenance.

5.0 Design

The MPO is a proponent of creating a multimodal, safe, and efficient transportation system that ensures accessibility to all roadway users. In order to increase the number of projects that provide multimodal facilities in central Iowa, the MPO developed Multimodal Guidelines. These guidelines recognize the importance of, and encouraged the concept of, complete street development.

5.1 Context Sensitivity

In recognition of context sensitivity, public input and the needs of many users, a flexible, innovative and balanced approach that follows other appropriate design standards may be considered, provided that a comparable level of safety for all users is present.

5.2 Long-Term

MPO members shall plan for projects being long-term. Transportation improvements are long-term investments remaining in place for many years. Design and construction of new facilities should anticipate likely future demand for transit, bicycling, and walking facilities and not preclude the provision of future improvements.

5.3 Corridors

Address bicyclists and pedestrians having a need to cross corridors as well as travel along those corridors. Even where bicyclists and pedestrians may not commonly use a particular corridor being improved or constructed, they will likely need to be able to cross that corridor safely and conveniently. Therefore, the design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is safe, accessible, and convenient.

5.4 Design Guideline References

MPO members shall follow accepted or adopted design standards and use the best and latest design standards available, while remaining flexible according to user needs and community context. Sources for design guidelines include:

- SUDAS: Iowa Statewide Urban Design and Specifications Manual;
- American Association of State Highway and Transportation Officials' (AASHTO) Guide for the Development of Bicycle Facilities;
- AASHTO's A Policy on Geometric Design of Highways and Streets;
- AASHTO's Guide for the Planning, Design, and Operation of Pedestrian Facilities;
- Federal Highway Administration's Manual on Uniform Traffic Control Devices for Streets and Highways;
- Institute of Transportation Engineer's (ITE) Recommended Practice – Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities;
- NACTO Urban Street Design Guide; and,
- MPO design standards.

6.0 Implementation

This policy will require all projects funded with federal dollars awarded by the MPO to support Complete Street principles. It is required that all projects in the Transportation Improvement Program (TIP) be consistent with this Complete Streets policy before federal funds are programmed and approved in the MPO's TIP.

6.1 Implementation Process

The following steps will be utilized to assure this policy is uniformly implemented:

1. MPO member governments are encouraged to consider the Complete Streets Policy at the time of project conception, and to contact MPO staff early on with any questions regarding what can be expected at the time of project application and, if the member government anticipates an exception request, what will be expected.
2. At the time of project application, the project sponsor shall indicate either the project's compliance with this Complete Streets Policy or request for an exception including supporting rationale.

3. During project selection, projects will be first sorted according to procedures in place prior to the effective date of this policy. Projects selected as priorities for funding will then be evaluated for compliance with this Complete Streets Policy. Exception requests will be reviewed according to section 6.2 Exception Process of this policy. Projects found not in compliance with this policy, or for which an exception request is denied, will be found ineligible for funding during the applied for funding cycle.

The TIP tracking process will be utilized to ensure continued compliance to this Complete Streets policy throughout project implementation.

The MPO recognizes that, during the course of project development, unforeseeable changes sometimes occur. However, member governments are encouraged to review equitably all elements of a proposed project prior to eliminating components due to budget constraints.

After the MPO has committed funding to a project, MPO staff should be notified immediately of significant project scope changes. Projects should be updated in the TIP to ensure that the system includes accurate information. Mention of the project scope change should also be included in the report tracking process. Depending on the significance of the change, a TIP amendment may be necessary. MPO staff can advise on this matter.

Due to the flexibility of the policy and the variety of approaches that a sponsor may take to complete a street, MPO staff, as stewards of the Complete Streets Policy, will work with the project sponsor throughout the final design process to find an acceptable solution for both parties.

6.2 Exception Process

If a project cannot meet the Complete Streets Policy, the project sponsor may request an exception when one or more of the following three conditions are met:

1. When bicyclists and pedestrians are prohibited, by law, from using the roadway. In this instance, a greater effort may be necessary to accommodate all users (bicyclists, motorists, transit vehicle users, and pedestrians of all ages and abilities) elsewhere within the right-of-way or within the same transportation corridor.
2. When the cost of establishing bikeways and walkways would be excessively disproportionate to the need or probable use, or would exceed budget costs (ex. Resurfacing). Excessively disproportionate is defined as exceeding twenty percent of the cost of the larger transportation project to include bikeways and walkways. In such a case, the project sponsor may propose an alternate design or spend twenty percent of the project cost of the larger project to improve accommodations for all users.
3. Where population is sparse or where other factors indicate an absence of future need. This condition's definition would be streets developed as a cul-de-sac with four or fewer dwellings or if the street has severe topographic or natural resource constraints. Also, an indication of absence of need would be daily traffic (ADT) projections being less than 500 vehicles per day over the life of this project.

Exception requests will be initially reviewed and sorted by MPO staff. Exceptions shall be granted only by a recommendation of the MPO's Surface Transportation Program (STP) Funding Subcommittee, be documented with supporting data that indicates the basis for the decision, and that the MPO approves the STP Funding Subcommittee's recommendation.

6.3 Continuing Support

As a part of implementing this regional Complete Streets policy, the MPO encourages member governments to:

- Notify and maintain regular communication with relevant departments, agencies, and committees within their jurisdictions when planning for transportation facilities;
- Review current design standards, including subdivision regulations which apply to new roadway construction, to ensure that

they reflect the best available design standards and guidelines, and effectively implement the regional Complete Streets policy;

- Form, or utilize an existing, local Technical Advisory Committee to discuss potential transportation projects and identify opportunities to include multimodal facilities;
- Encourage staff to undergo professional development and training for non-motorized transportation issues by attending conferences, classes, seminars, and workshops;
- Promote inter-departmental project coordination among city departments with an interest in the activities that occur within the public right-of-way in order to better use fiscal resources;
- Include an educational component to ensure that all users of the transportation system understand and can safely utilize Complete Streets project elements; and
- Consider the creation of a local Complete Streets policy to apply to all non-MPO supported projects. Local policies established after the effective date of the MPO Complete Streets Policy should strive to equal or exceed the requirements herein.

7.0 Evaluation/Performance Measures

The MPO shall, at a minimum, evaluate this policy and the documents associated with it every two years. This evaluation may include recommendations for amendments to the Complete Streets Policy.

The MPO will report on the annual increase or decrease for each performance measure listed below, compared to the previous year(s), in order to evaluate the success of this Complete Streets policy.

- Total miles of on-street bicycle facilities
- Total miles of off-street bicycle facilities
- Completion of Safe Routes to School projects
- Percentage of transit stops accessible via sidewalks and curb ramps
- Rate of crashes, injuries, and fatalities by mode
- Number of approved and denied exceptions

Local Complete Streets Sample Policy

The following language is similar to the policy adopted by the City of Des Moines.

The term complete street means designing and building the streets so the streets routinely accommodate travel by all modes. To complete a street will expand the capacity to serve everyone who travels, be it by motor vehicle, foot, bicycle, or other means. A complete street may look quite different on different sides of the same city, but both are designed to balance safety and convenience for everyone using the road. Complete streets are essential for access by people who cannot drive. Roads without safe access for non-motorized transportation represent a barrier for people who use wheelchairs, and for older people and children. The [City/County name] recognizes this need for complete streets and will accommodate elements that create a complete street where possible. Some of the elements under consideration for inclusion on a complete street can be sidewalks, shared use paths, bike lanes, paved shoulders, street crossings (including over and under crossings), pedestrian signals, signs, street furniture, transit stops and facilities, as well as all connecting pathways shall be designed, constructed, operated, maintained, and accommodated in all transportation projects so that all modes and pedestrians, including children, elderly and people with disabilities, can travel safely and independently.

To this end, [City/County name] will:

- Create a committee to consider and recommend what complete streets elements be included with every street project undertaken by [City/County name]. Members on this committee could be representatives from the [City/County name] departments representing engineering, transportation, parks and recreation, emergency services, and planning.
 - Work with the [City/County name] departments, Des Moines Area Regional Transit Authority, the Metropolitan Planning Organization, and other transportation advocates to identify bicycle, pedestrian, and transit planning and design issues appropriate to the project.
1. Bicycle and pedestrian ways shall be established in new construction and reconstruction of road and bridge projects within [City/County name] unless one or more of three conditions are met:
 - 1.1 Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accommodate all users (bicyclists, motorists, transit vehicles and users, and pedestrians of all ages and abilities) elsewhere within the right of way or within the same transportation corridor.
 - 1.2 The cost of establishing bikeways and walkways would be excessively disproportionate to the need or probable use or exceed budget costs (ex. resurfacing). Excessively disproportionate is defined as exceeding twenty percent of the cost of the larger transportation project. In this case, the project sponsor may propose an alternate design or spend twenty percent of the project cost of the larger project to improve accommodations for all users.
 - 1.3 Where sparsity of population or other factors indicate an absence of future need. This is defined as streets developed as a cul-de-sac with four or fewer dwellings or if the street has severe topographic or natural resource restraints. Also an indication of absence of need is when the average daily traffic (ADT) is projected to be less than 500 vehicles per day over the life of this project.
 2. The design and development of the transportation infrastructure shall improve conditions for transit users, motorists, bicyclists and pedestrians through the subsequent steps:
 - 2.1 Plan projects for the long-term. Transportation improvements are long-term investments that remain in place for many years. The design and construction of new facilities should anticipate likely future demand for transit, bicycling, and walking facilities and not preclude the provision of future improvements.
 - 2.2 Address the need for bicyclist and pedestrians to cross corridors as well as travel along them. Even where bicyclists and pedestrians may not commonly use a particular corridor that is being improved or constructed, they will likely need to be able to cross that corridor safely and conveniently. Therefore the design of intersections and interchanges shall accommodate bicyclist and pedestrians in a manner that is safe, accessible, and convenient.

2.3 Design facilities to the best currently available standards and guidelines. The design of facilities for bicyclists and pedestrians should follow design guidelines and standards that are commonly used, such as:

- AASHTO Guide for the Development of Bicycle Facilities,
- AASHTO's A policy on Geometric Design of Highways and Streets,
- AASHTO's Guide for the Planning, Design, and Operation of Pedestrian Facilities,
- SUDAS: State Urban Design and Specifications Manual,
- Federal Highway Administration's Manual on Uniform Traffic Control Devices for Streets and Highways,
- ITE Recommended Practice Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities;
- National Association of City Transportation Officials (NACTO) Urban Street Design Guide; and,
- MPO design standards.

Recommended Roadway Design Standards

Streets are a community's largest asset and make up the majority of the public space in the city. The design of the street should send a message to private developers as to the type of development that is appropriate along the street.

General Principle: The purpose of streets is to facilitate the movement and socialization of people.

General Principle: Streets will be designed to create high quality public spaces that have a positive influence on the built environment.

Elements of Street Design

Travel Lanes

The width of travel lanes has a significant impact on the quality of the public space. Travel lanes wider than 11 feet degrade the public realm. Wider travel lanes increase the speed of vehicular traffic and increase the crossing distance for pedestrians at intersections. The ideal travel lane width for most urban streets with speeds below 35 mph is 10 feet.

Sidewalks

Sidewalks are a critical part of the urban environment. Sidewalks should be a minimum of 5 feet wide in residential settings and 8-12 feet in commercial and downtown settings. Sidewalks in commercial and downtown locations should include the space for sidewalk cafes, street furniture, lighting, and street trees while maintaining an adequate pedestrian thoroughway.

Corner Radii

Corner radii have a significant impact on vehicle speed and pedestrian crossing distance at intersections. The target curb radius should be 5 feet, limiting turning speeds to 5-10 mph.

Building Placement

Buildings should be built close to the street to provide an active pedestrian realm. This can be accomplished using build-to-lines instead of setbacks. Placing buildings next to the street also creates spatial enclosure that is essential for pedestrian comfort.

On-Street Parking

On-street parking should be required in all commercial districts. On-street parking provides a buffer between the travel lanes and the pedestrian realm. On-street parking lanes should be 7-8 feet wide for parallel parking and 17 feet wide for diagonal parking.

Trees

Street trees should be planted on all city streets. Trees should be planted in the landscape buffer between the street and the sidewalk. Tree spacing should not exceed 50 feet and should ideally be 30 feet. Trees also should be planted in the center median when one exists. Species should be selected that grow sufficiently tall enough to create spatial enclosure and provide a canopy over the street. Street trees provide multiple benefits including increasing property values, reducing the urban heat island effect, decreasing energy demands, absorbing harmful pollutants, reducing stormwater runoff, and lengthening the life of the pavement by up to 60 percent.

Center Medians

Center medians should be included on boulevards and avenues, and should be wide enough to accommodate large trees (8 feet minimum). Center medians provide a refuge for pedestrians crossing larger thoroughfares. Center medians should extend to the intersection. Trees planted in the median should extend to the crosswalk area.

Speed

Streets should be designed using the target speed not operational speed. The target speed is the intended driving speed, and the 85th percentile should fall between 10-30 mph on the majority of city streets. Target speed should equal design speed which should equal posted speed.

Connectivity

Streets should have a high level of connectivity. Cul-de-sacs should be used only in cases where geography makes connection to a through street impossible.

Block Size

Blocks should be small to maximize the number of intersections per mile and help spread traffic across the transportation system. Block lengths can range from 200 feet in downtown/town center locations to 1,000 feet in residential areas. Block lengths between 400-600 feet are ideal.

Lot Size

Lot size (platting) has a significant impact on density and the character of street design. Historically platting in the United States used increments of 25 feet. However, this increment was chosen before the prevalence of the automobile and the necessity to provide parking. However, the 25 foot increment does not correspond with the basic parking dimensions required for head-in parking (12 feet) and double parking rows (72 feet). Therefore, to allow for the highest levels of density while meeting parking requirements, platting should use increments of 6 feet. This results in lot sizes of 18, 24, 36, 54, 72, and 144 feet.

Design Vehicle

Urban streets should be designed with the most vulnerable users in mind – pedestrians. The majority of streets should use the DL-23 as a design vehicle. In areas with frequent larger design vehicles, use alternative measures like recessed stop bars. The design at intersections should allow for a typical turning speed of 5-10 mph.

Utilities

Utilities should be placed underground whenever possible. In areas where burying is not an option, site design should include rear alleys and lanes. Overhead utilities should be located in the alleys or lanes to maintain the quality public realm along the street frontage. Alleys also can serve to facilitate other unsightly functions such as garbage collection.

Spatial Definition

People feel most comfortable in spaces that provide enclosure. This is best accomplished by placing building facades close to the street. The ideal height-to-width ratio for an urban thoroughfare is 1:1. In areas where this ratio is exceeded, trees can provide the spatial enclosure necessary to create a comfortable public realm. It is important to plant species that will grow tall enough to provide the proper height-to-width ratio.

Parking

Parking should be located in the back of buildings and accessed through a rear alley or lane. Parking structures are preferable to larger surface parking. Parking structures should be built with flat floors, comfortable floor-to-ceiling heights (10 feet minimum) and enough loading capacity to support other uses. This will allow parking structure to be converted to office and residential uses when they are no longer needed for parking vehicles.

Recommended On-Street Bicycle Facility Standards

The following information is pulled from the MPO's On-Street Bicycle Facility Feasibility Study.

Signage + Markings

An important element of implementing on-street facilities in a new area is both education within the community and continuity among design elements to convey the intended method of use. In efforts to provide on-street facilities with the same look and feel, the MPO identified signage and markings as an area to review the current design standards and provide guidance where appropriate. The intent is to provide on-street facilities, regardless of type, that look and feel the same throughout the metro area. For the user, this not only offers a facility that is familiar and easy to navigate, but also has a unique identity.

NACTO provides three levels of guidance: Required, Recommended and Optional. Required and Recommended Features are elements necessary for the facility's proper function and safety. It is suggested that these features are adhered to wherever possible. Optional Features however, are elements that can vary across cities and may add value depending on the circumstance. The MPO felt it was important to evaluate the Optional Features and provide guidance where possible. Cities such as West Des Moines and Des Moines who have already implemented on-street facilities were also consulted as part of the process to help determine what facility types and practices are currently being used within the surrounding metro area.

Ultimately the MPO identified seven key areas to provide guidance.

- Bike Lane and Shared Lane Markings
- Intersection Crossing Treatments
- Bicycle Signal Detection
- Pavement Marking Material Guidance
- Green Lanes and Bike Boxes
- Facility Signage
- Route Wayfinding

Treatment Recommendations

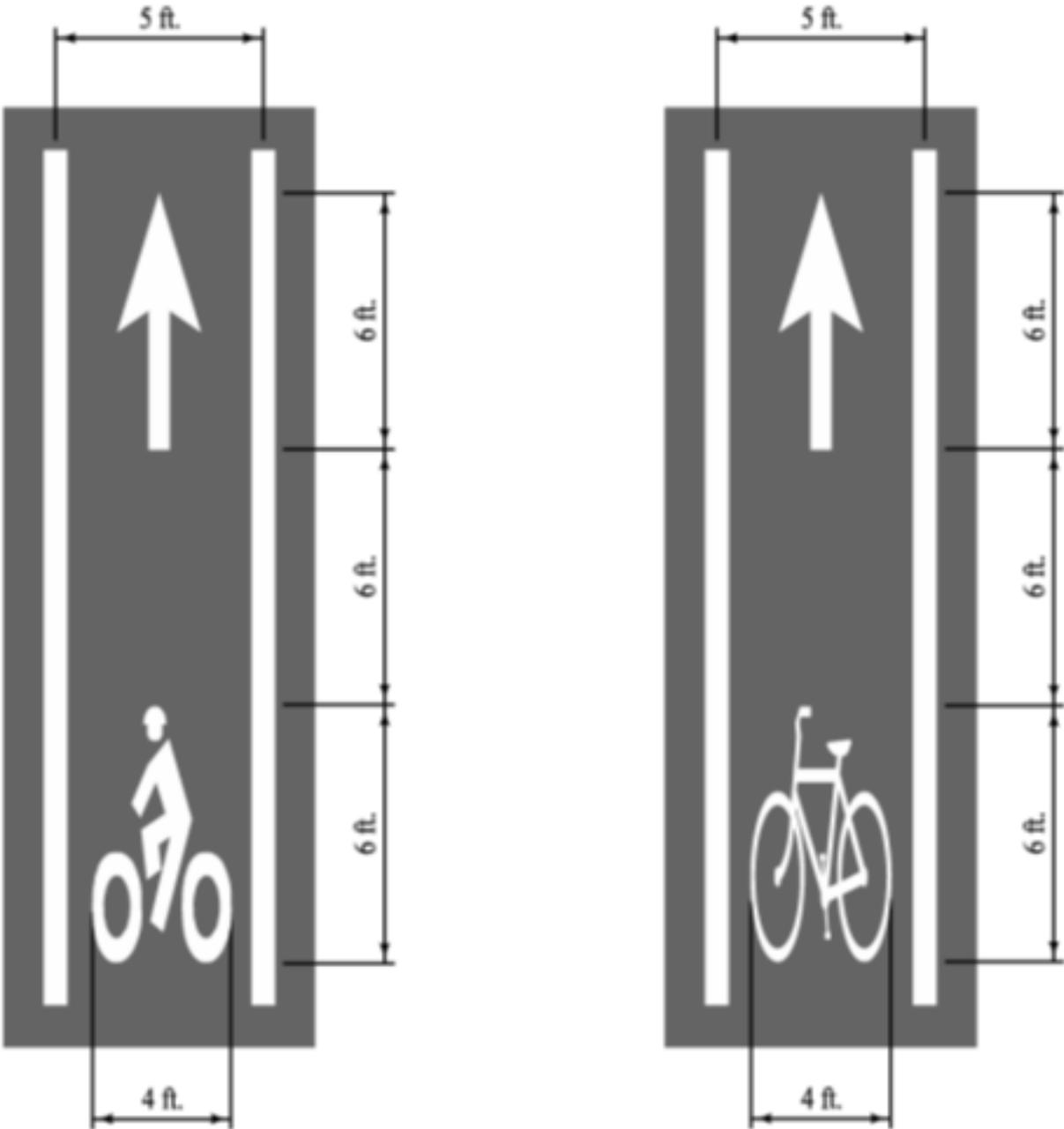
Bike Lane and Shared Lane Markings

Two of the most frequently used on-street bicycle treatments are bike lanes and shared lanes. Review of existing guidance through National Association of City Transportation Officials (NACTO), Iowa Statewide Urban Design and Specifications (SUDAS), and Manual for Uniform Traffic Control Devices (MUTCD) guide books identified two acceptable bicycle lane markings as shown in the following figure. At minimum, the bicycle symbol shall be used to define the preferential use of the bike lane. The MUTCD designates the directional arrow as optional, however it is listed as a Required Feature through NACTO.

Recommendation

The MPO recommends the helmeted bicyclist symbol in conjunction with the directional arrow be implemented as a minimum treatment for all future bike lanes in the MPO Planning Area. Refer to the NACTO Urban Bikeway Design Guide, available at <http://nacto.org/cities-for-cycling/design-guide/bikeway-signing-marking/>, for placement of symbols. Intervals of placement shall not exceed 1000 feet. A cycle track, like a bike lane, is a preferential lane as defined by the MUTCD; therefore, the same symbol marking recommendations for bike lanes shall also apply to cycle tracks.

BIKE LANE SYMBOL MARKING



The City of Des Moines has over 4 miles of bike lanes in the downtown area, as well as designated quiet streets marked by Shared Lane Markings (SLM). The traditional shared lane marking as defined by the MUTCD consists of two chevron “V” markings with a bicycle symbol. To minimize the cost of purchasing additional stencils, the City of Des Moines was granted approval through the FHWA to use the same helmeted bicycle symbol on shared lane markings as used to designate bike lanes.

Recommendation

The MPO recommends the use of the helmeted SLM. By using the helmeted symbol, the shared lane marking not only remains consistent with the markings used to designate bike lanes, but also minimizes cost to the local agency. Refer to the NACTO Urban Bikeway Design Guide, available at <http://nacto.org/cities-for-cycling/design-guide/bikeway-signing-marking/>, for placement of symbols. Intervals of placement shall not exceed 500 feet.

TRADITIONAL SHARED LANE MARKING



HELMETED SHARED LANE MARKING



Intersection Crossing Treatments

Though intersections make up a small portion of a cyclists travel distance, they are one of the most hazardous areas, accounting for approximately 50 percent of all bicycle-vehicle accidents. While guidance is provided through NACTO and the MUTCD on intersection crossing markings, it is a suggested treatment. The City of Des Moines reserves use of any bicycle specific intersection crossing treatments for unconventional crossings or maneuvering and is the exception, as opposed to normal practice.

Recommendation

The MPO suggests the decision to implement intersection crossing markings be left to engineering judgment and the discretion of the local agency.

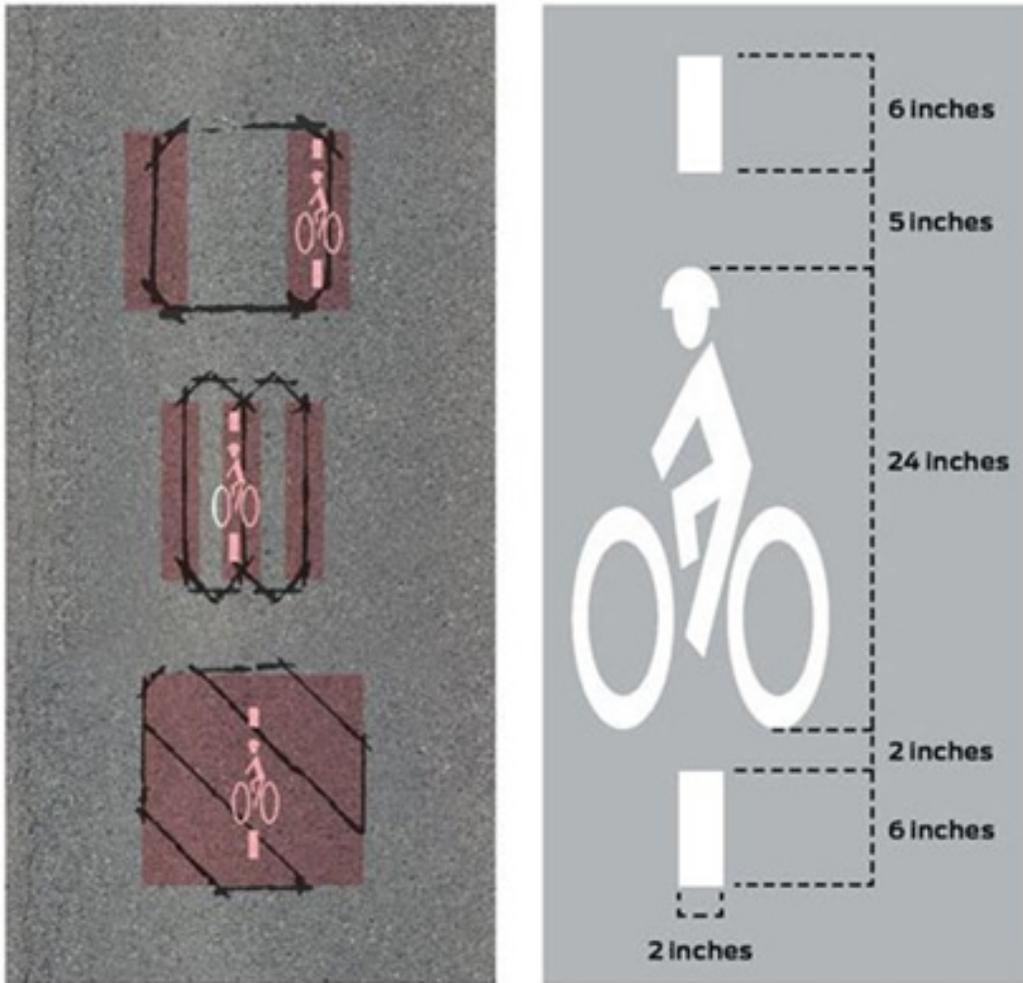
Bicycle Signal Detection

Bicycle signal detection occurs either by the use of a push button or by automation (inductive pavement loops, cameras, radar, etc.). A common issue cyclists encounter when navigating a signalized intersection is where to position their bicycle to activate the traffic signal. For a bicycle to be detected the bicycle must be placed within the red highlighted areas as shown in the figure on the following page and the inductive loop has to be adjusted to a higher sensitivity to detect the metallic mass of the bicycle. Otherwise, undetected cyclists are forced to wait for a vehicle, dismount and press a pedestrian button, or cross illegally. Pavement markings and signage are used to properly position the cyclist on the inductive loop or zone if using other means of detection with the highest sensitivity. In addition to increasing the sensitivity of the detector, NACTO and the MUTCD recommends use of a helmeted bicyclist symbol marking the location of the most sensitive area of the traffic sensor, and a R10-22 sign so that the bicyclist knows the intersection has detection and where to position their bicycle to activate the signal.

Recommendation

The MPO recommends bicycle detection pavement markings and signage be provided at any intersection where an on-street bicycle facility is located and actuation is required to call the signal. Signs shall be mounted in a visible location in front of or adjacent to the bicycle detector pavement marking. The pavement marking shall be placed over inductive loops as shown in the following illustration.

BICYCLE DETECTOR PAVEMENT MARKING



R10-22 SIGN



Pavement Marking Material Guidance

There are three main types of pavement markings in use: non-durable waterborne paint, Epoxy-based Durable Liquid Pavement Markings (DLPM), and thermoplastics.

Non-durable paint is the least expensive and the most widely used in the United States. The average installed price of non-durable paint is roughly \$4 per linear 100 feet or \$1.20 - \$1.60 per square foot. Advantages of non-durable paint include quick dry times (under 30 minutes depending on ambient temperatures) and minor surface preparation. Glass beads for reflectivity and skid resistance may be added to the paint; however, they are often worn down with high traffic and snow removal. The main disadvantage of the non-durable pavement markings is that in snowy climates or high traffic areas, they rarely hold up for more than six months to a year.

DLPM are either an epoxy or acrylic based resin. The average installed bid item price is approximately \$25 per linear 100 feet or \$3 - \$4 per square foot. More costly than non-durable paint, DLPM's can last 3-5 years depending on conditions. Reflective and non-skid materials may also be added to DLPM's, however there are some disadvantages to be mindful of. Because DLPM's are epoxy or acrylic based, dry times can require more than an hour. They are also more sensitive to existing oils on the pavement and require more surface preparation over non-durable paint. The lifetime of DLPM's can be significantly shortened if the pavement is in poor condition.

Thermoplastics are another type of durable pavement marking and typically come in square or pre-formed sheets. They are bonded to the pavement by heating the sheets to 400°-450°F. Due to the structure of thermoplastics, they are best suited for pavement symbols or colored lane markings, not linear striping. Thermoplastics are the most expensive of the three materials at \$10 - \$14 per square foot installed. Advantages to thermoplastics are an average lifetime of 5 years, easy spot fixes, and ability to provide reflectivity and skid resistance throughout the material rather than just the top coating. A significant disadvantage to thermoplastics is they have to be recessed or ground into the pavement if they are to be used in a snowy climate to avoid damage by plows. This process would be in addition to the installed cost.

Recommendation

All three types of pavement markings are appropriate for use on projects. The material type does not directly affect the functionality of on-street bike facilities. It is for this reason the MPO recommends the decision be left to the local agencies to decide what type of pavement marking is best suited. There are many other local factors to be considered on a case by case basis including amount of traffic, maintenance schedules, preference of the agency, and budgets. For additional information please refer to the NACTO Urban Bikeway Design Guide – Colored Pavement Material Guidance, accessible at <http://nacto.org/cities-for-cycling/design-guide/bikeway-signing-marking/colored-pavement-material-guidance/>.

Green Lanes and Bike Boxes

Green, reflective, colored pavement markings may be used to highlight conflict areas and increase visibility of bicycle lanes, intersection crossings and other potentially hazardous areas between bicyclists and vehicles. Delineating these areas reinforces priority to bicyclists in conflict areas and has proven to increase motorist yielding behavior. Green pavement markings can be particularly helpful at intersection approaches with through bike lanes and right turning vehicle traffic.

Bike boxes are another intersection treatment that may be used in conjunction with green pavement markings. A bike box is a designated area at signalized intersections that provide a safe, visible space in front of traffic during the red signal phase. Bike boxes provide several benefits to bicyclists. By placing the bicyclists ahead of traffic, bicyclists are better positioned to make left and right turning movements. Additionally, bike boxes allow bicyclists to group together and clear the intersection quickly, minimizing impediment to vehicular traffic. NACTO lists colored pavement markings as a Recommended Feature for bike boxes. For bike lanes, colored pavement markings are considered an Optional Feature to delineate conflict areas. Color may be applied along the entire corridor of a bike lane with a gap in coloring to denote the conflict areas or used vice versa where color is only applied within the conflict areas.

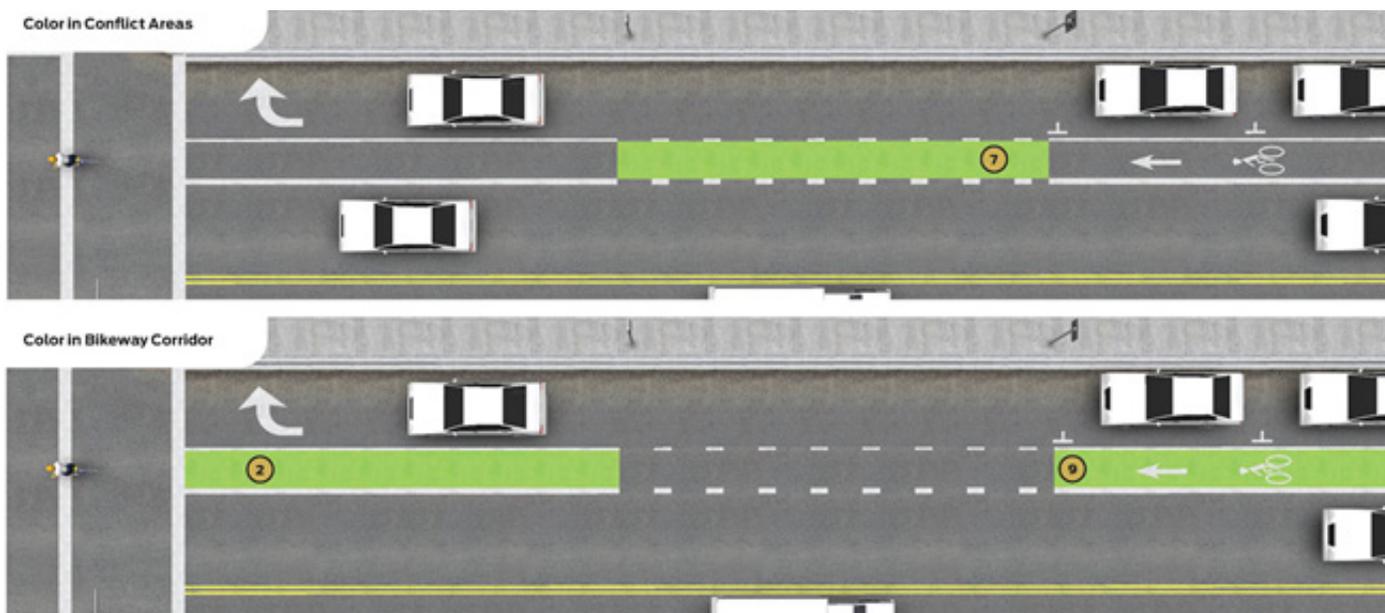
COLORED BIKE LANE AND BIKE BOX



Recomm

To increase visibility at conflict areas, the MPO recommends only using green colored pavement markings in conflict areas as shown in the top graphic of the figure below or within bike boxes at a signalized intersection. Colored pavement markings will require increased maintenance over traditional striping. The use of colored bike boxes and colored bike lanes shall be reserved for higher conflict areas or at intersections with high volumes of bicycles and motor vehicles, especially those with frequent bicycle left turning movements.

COLORED BIKE LANE



Facility Signage

An R3-17 "Bike Lane" sign is an optional treatment along bike lanes and cycle tracks as listed in the NACTO Urban Bikeway Design Guide.

The sign is useful as an additional visual cue for vehicular traffic to further designate the preferential use for bicyclists. While the sign is mandatory in some states, the MUTCD classifies the sign as optional and cautions against overuse.

R3-17 SIGN



R4-11 SIGN



W11-1 + W 16-1 SIGNS



Recommendation

The MPO recommends the use of the R3-17 “Bike Lane” sign. Placement shall be in accordance with the MUTCD Section 9B.04 and shall not exceed 1000 feet in spacing. It is also recommended that the placement of the sign be staggered with the bike lane symbol markings.

The R4-11 “May Use Full Lane” sign is a sign used to designate the potential presence and right of way for bicyclists. Unlike the R3-17 “Bike Lane” sign is reserved for streets with shared lanes or a designated bike route. The R4-11 sign was added in the 2009 revision. Another sign combination often used to designate shared lanes and bike routes, are the combined W11-1 and W16-1 “Share the Road” signs. Many cities have abandoned the combined W11-1 and W16-1 signs and adopted the “May Use Full Lane” signs. The “May Use Full Lane” sign conveys a clearer message to users of the roadway unlike the combined “Share the Road” signs.

Recommendation

The MPO recommends the use of the R4-11 “May Use Full Lane” sign in place of the combined W11-1 & W16-1 “Share the Road” signs. Placement and size of signs shall be in accordance with the MUTCD Section 9B.04 and shall not exceed 1000 feet in spacing. It is also recommended that the placement of the sign be staggered with the bike lane symbol markings.

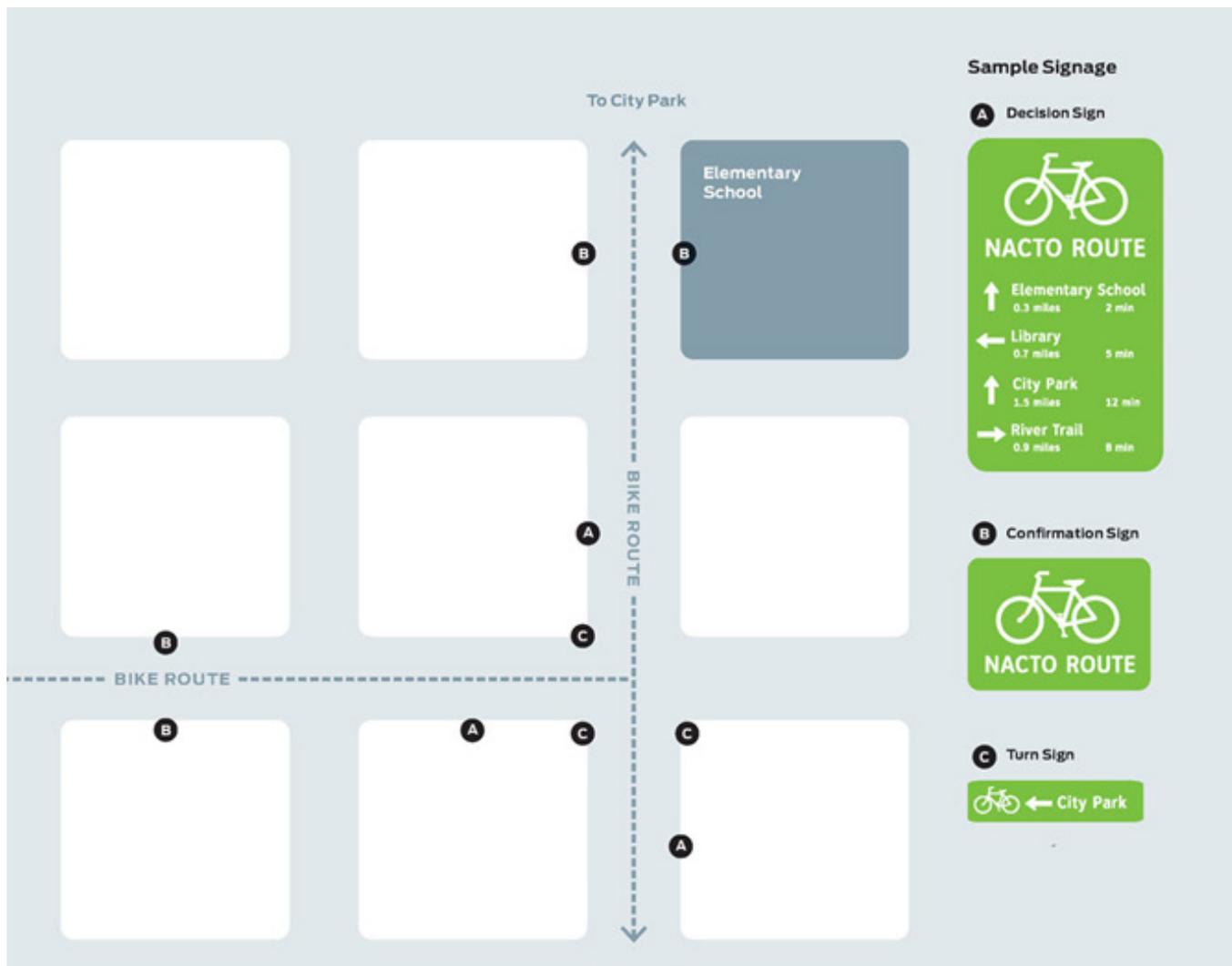
Route Wayfinding

Whether a bicyclist is riding on an off-street trail or an on-street bike route, it is necessary for them to develop a sense of awareness of where they are located in relation to their surroundings. Signage, trail guides, and maps are components of the wayfinding process that aid the user as they gather information on location and distances between destination points. Signage that includes both mileage and average travel time to destinations can also be a helpful feature to the user when estimating time it takes to travel. Though on-street bicycle routes benefit from existing street signs and landmarks to orient the user, wayfinding along routes should support the infrequent or first time user. Consistency of signage, use, message, and appearance are essential in communicating with the user.

NACTO outlines multiple Recommended Features; however the only Required Features are MUTCD standards in Section 9B.01 (Application and Placement of Signs), and Section 9B.20 (Bicycle Guides Signs). Guidance is provided on types of signs including Decision, Confirmation and Turn signs and their placement. Prior to the development of wayfinding signage, it is recommended that a list to identify and classify points of interest be developed by the local municipalities. Once on-street routes are established, these lists then can be compiled and prioritized along the routes as primary, secondary, and tertiary points of interest, as shown on the sample “Decision Sign” in the following illustration. The level of effort to study on-street wayfinding and make proper recommendations exceeds the scope of this study.

The ultimate goal of the MPO is to conduct a comprehensive wayfinding study that can address sign type, placement, messages, and identity in one unified report.

SIGN TYPES AND PLACEMENT



Facility Design Recommendations

The following pages provide design examples for the on-street bicycle facilities discussed in this report. These examples are intended to illustrate the variety of ways to accommodate bicycle use on our streets and to provide some direction on design specifications for each facility type. It is important to note that the examples listed are not exhaustive. When converting existing streets to include facilities for bicycles, every case is unique and design standards should be used in conjunction with professional judgment and creativity. The NACTO Urban Bikeway Design Guide offers best practices for any community working to improve their on-street bicycle network and should be the starting point for any facility design. Valuable resources can be found at <http://nacto.org/cities-for-cycling/design-guide/> and at http://transect.org/docs/bicycling_pdfs.zip.

PS — Paved Shoulder

Riding Surface Width	6-foot minimum
Movement	With traffic
Intersection Treatment	Signed, signalized
Posted Speed	55 mph
AADT	N/A



SL — Shared Lane

Riding Surface Width	Shared vehicular lane with sharrow
Movement	With traffic
Intersection Treatment	Signed, signalized, indicator loops
Posted Speed	25 mph
AADT	8,000



BL — Bicycle Lane

Riding Surface Width	5-foot minimum
Movement	With traffic
Intersection Treatment	Signed, dashed, Peg-a-Track, colored
Posted Speed	30 mph
AADT	15,000





BLB — Buffered Bicycle Lane, Type 1

Riding Surface Width	5-foot minimum, 2-foot striped buffer, and 2-foot shy zone
Movement	With traffic
Intersection Treatment	Signed, dashed, Peg-a-Track, colored
Posted Speed	30 mph
AADT	15,000



BLB — Buffered Bicycle Lane, Type 2

Riding Surface Width	5-foot minimum with parking lanes and 2-foot shy zone
Movement	With traffic
Intersection Treatment	Signed, dashed, Peg-a-Track, colored
Posted Speed	35-45 mph
AADT	25,000



BLB — Buffered Bicycle Lane, Type 3

Riding Surface Width	5-foot minimum with bollards
Movement	With traffic
Intersection Treatment	Signed, dashed, Peg-a-Track, colored
Posted Speed	35-45 mph
AADT	25,000

BLB — Buffered Bicycle Lane, Type 4

Riding Surface Width	5-foot minimum with median separation
Movement	With traffic
Intersection Treatment	Signed, Peg-a-Track
Posted Speed	35-50 mph
AADT	30,000



BLB — Buffered Bicycle Lane, Type 5

Riding Surface Width	5-foot minimum with planter
Movement	With traffic
Intersection Treatment	Signed, Peg-a-Track
Posted Speed	35-50 mph
AADT	30,000



Recommended Parking Management Guidelines

The following section lists a menu of strategies that can be applied to Greater Des Moines. The policies are divided into four topics: Parking Regulations & Incentives, Pricing & Payment, Promote Alternate Modes, and Sustainable, Walkable Design. Not all strategies are applicable to the entire region; thus, next to each policy is a classification of relevance to the region or the Central Business District (CBD).

Parking Regulations & Incentives

Eliminate minimum parking requirements (CBD)

Minimum parking requirements have been proven to oversupply parking. Studies of suburban business parks have found that, while the zoning code often demands 3 to 4 parking spaces per 1,000 feet or one space per employee, the actual average parking utilization rate was 2.2 spaces per 1,000 feet.¹ This equates to a 26 percent oversupply. Getting rid of minimums would not be a ban on new parking; it would simply allow market forces to calculate how much parking is needed to meet demand. For example, Boulder, Colorado, has no minimum parking requirement for non-residential uses in its CBD. Developers build as much parking as they see fit and can purchase permits at public lots to sell to residents should they choose to build little or no parking.²

Establish maximums (Region)

Parking maximums set an absolute upper limit on how much parking may be provided at any given building or site. Maximum ratios are especially effective in suburban areas where developers of big box retail build far more supply than is needed. Area-wide limits called parking caps can also be used. To ensure maximums do not prohibit certain parking-intensive uses, the zoning code in Portland, Oregon, allows parking rights to be transferred or sold to another development.³

Flexible standards(Region)

The major drawback of current parking requirements is their inflexibility, where minimums are applied rigidly to every land use regardless of context. Many communities have begun including “discounts” to minimum requirements based on factors that reduce auto use. An example of adjustments to minimums is shown below.

PARKING REQUIREMENT ADJUSTMENT FACTORS

FACTOR	DESCRIPTION	TYPICAL ADJUSTMENT
Employment Density	Number of employees per acre	Reduce 10-15% in areas with 50 or more employees per gross acre
Transit accessibility	Nearby transit service frequency and quality	Reduce requirements 10% for housing and employment within ¼ mile of frequent bus service; 20% for rail
Demographics	Age and physical ability of residents	Reduce 20-40% for housing for young (under 30), elderly (over 65), or with a disability
Income	Average income of residents or commuters	Reduce 10-20% for the 20% lowest income households; 20-30% for lowest 10%
Off-site parking	Availability of nearby parking spaces	Consider sharing existing facilities before building new

Source: Adapted from Litman, Parking Management

1 Transportation Research Board. Traveler Response to System Change: Chapter 18 Parking Management and Supply. 2003. http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_95c18.pdf.

2 Metropolitan Transportation Commission. Parking Code Guidance: Case Studies and Model Provisions. 2012. http://www.mtc.ca.gov/planning/smart_growth/parking/6-12/Parking_Code_Guidance_June_2012.pdf.

3 Parking maximums set an absolute upper limit on how much parking may be provided at any given building or site. Maximum ratios are especially effective in suburban areas where developers of big box retail build far more supply than is needed. Area-wide limits called parking caps can also be used. To ensure maximums do not prohibit certain parking-intensive uses, the zoning code in Portland, Oregon, allows parking rights to be transferred or sold to another development.

For example, in Milwaukee, Wisconsin, developments within a defined geographical area near transit are granted reductions of up to 15 percent in the minimum requirements.⁴ In Portland, Oregon, the reduction stipulates that the transit must be high-frequency — if service runs every 20 minutes or better during peaks, the minimum is waived.⁵

In Seattle, minimums are reduced in affordable housing units to 0.5-1 space per unit. The best practice is to root parking policy in empirical evidence. An inventory of parking supply — on- and off-street, public, and private — and utilization will give a city invaluable information on which to base code. Another method is contingency planning, in which the low end of an estimate is used to build parking, with additional land banked as green space only to be converted to parking if demand warrants.⁶

Sharing parking (Region)

Shared parking means that one parking supply is shared by two or more land uses. In Greater Des Moines, where every development has its own parking lot, sharing parking for all land uses has major potential to accommodate growth without significantly adding new spaces. In Ankeny, parking regulations acknowledge that providing parking spaces required for isolated uses may result in oversupply. Ankeny's Municipal Code states the planning director "may permit deviations from the presumptive requirements ... and may require more parking or allow less parking."⁷ Building upon this type of flexibility, many communities have developed specifications for allowing shared parking such as, for instance, if parking is already available within a certain number of feet from the new development.⁸ In downtown areas where parking supply is less abundant, shared parking may succeed best when shared between two different land uses with different peaks, such as office and a movie theater. Shared parking encourages a "park once" mentality and increases walking between destinations rather than driving. The concept of shared parking is illustrated on the following page.

Shared parking is implemented by contractual agreement between two users or through a parking management district. A government policy supporting shared parking encourages its application, and, in some cases, changes to the zoning code are required.⁹

Unbundle parking cost (Region)

When a developer prices a dwelling unit, the company divides the total cost by the total units. Yet parking is a major component of development costs that simply gets sunk into the customer cost. The full cost of parking should be "unbundled" from residential rents and mortgages to let people choose whether they need a parking space or not. San Francisco has adopted a citywide unbundling ordinance. Unbundling can also be applied to commercial space — Bellevue, Washington, requires offices of more than 50,000 square feet to identify parking costs on all leases.¹⁰

Parking Benefit District (CBD)

Numerous parking garages and on-street facilities operate in downtown Des Moines. A Parking Benefit District is designed to take revenues from paid parking in the District to fund public improvements that benefit the District itself. If parking revenues are otherwise directed into general revenue, where they may appear to produce no direct benefit for the District, there will be little support for installing parking meters or for raising rates when District merchants and property owners can clearly see that the monies collected are being spent for the benefit of their blocks, on projects that they have chosen, they often become willing to support market rate pricing. The structure of Parking Benefit Districts varies and can be managed by a municipality or a private entity such as a Business Improvement District. Typically, they serve a downtown or neighborhood.

4 EPA. Parking Spaces, Community Places. 2006. <http://www.epa.gov/dced/pdf/EPAParkingSpaces06.pdf>.

5 Metropolitan Transportation Commission. Parking Code Guidance: Case Studies and Model Provisions. 2012. http://www.mtc.ca.gov/planning/smart_growth/parking/6-12/Parking_Code_Guidance_June_2012.pdf.

6 Litman, Todd. Parking Management. 2011.

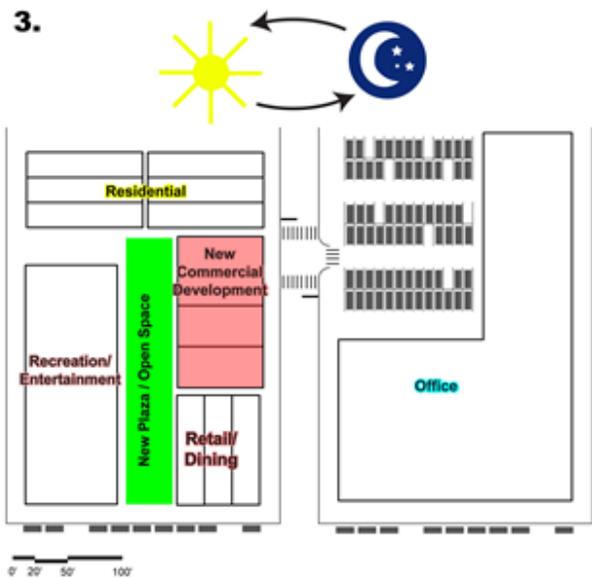
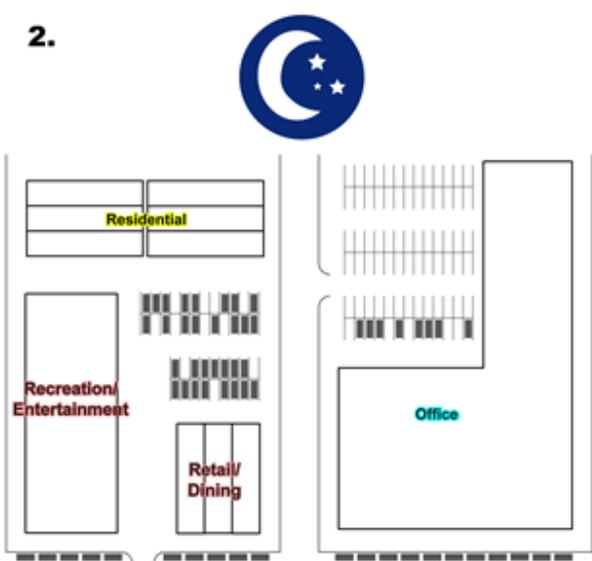
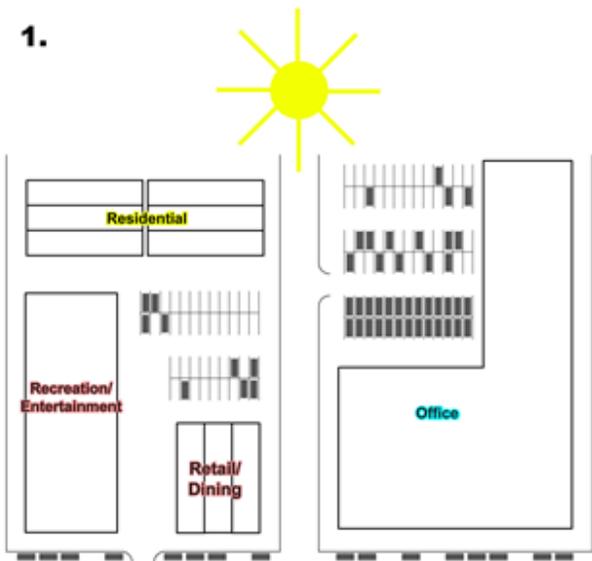
7 Ankeny Municipal Code Chapter 194: [http://www.amlegal.com/nxt/gateway.dll/iowa/ankeny_ia/codeofordinancesofthecityofankeny_iowa?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:ankeny_ia](http://www.amlegal.com/nxt/gateway.dll/iowa/ankeny_ia/codeofordinancesofthecityofankeny_iowa?f=templates$fn=default.htm$3.0$vid=amlegal:ankeny_ia).

8 For examples of specific shared parking ordinances, see http://www.mtc.ca.gov/planning/smart_growth/parking/parking_seminar/Toolbox-Handbook.pdf, page 29.

9 Several examples of codes adopted that support shared parking can be viewed in Appendix B of this document: http://www.crw.org/pdf_files/review_national_trends_parking_requirements.pdf.

10 Tumlin, Jeffrey. Sustainable Transportation Planning. 2012.

CONVENTIONAL PARKING SUPPLY AND UTILIZATION VERSUS POTENTIAL WITH SHARED PARKING



1. DAYTIME

- The office parking lot contains excess parking spaces.
- Moderate occupancy at the commercial block

2. EVENING

- Very few cars remain at the office lot - people working late, maintenance staff.
- Parking at the commercial block fills up, as does on-street parking.

3. SHARED PARKING

- Use the excess daytime capacity at the office lot for commercial users next door.
- At night, commercial customers can park in the office lot and walk across the street to stores and recreation.

BENEFITS

- Allows for new development in spaces that were dedicated to parking.
- Fosters a "park once" attitude that helps downtowns thrive by increasing foot traffic and decreasing driving.
- Allows closure of the curb cut on the commercial block. Benefits:
 1. Improves the pedestrian environment.
 2. Makes room for one more on-street parking space.

In-lieu fees (Region)

Many municipal codes require property owners to provide off-street parking for those persons who will use their facility. In-lieu fees allow developers to pay for transportation improvements elsewhere instead of providing parking on site. This allows more development in central areas where space for additional parking is restricted. This program can provide funding to help develop shared parking facilities such as municipal garages or to fund public transit services. The procedures for implementing and collecting cash-in-lieu generally must be defined through a by-law. Though fees are often used to construct new parking, some cities are now including provisions for the fees to be used for other benefits such as streetscaping, bicycle facilities, etc.

Cash-out (Region)

Similar to unbundling, cash-out consists of a financial incentive to consider alternatives to driving. Cash-out gets applied at the employee side and allows employers to award a one-time cash payout to employees who commit to not driving. The value of the cash payment

is equal to the amount the employee would have received in parking space subsidy and is cheaper for the employer than building new parking.

Reduce stall dimensions (Region)

Stall dimensions may range from 8.5'x18' to 9'x20', large enough for the largest SUV. Since drivers are moving slowly in parking lots and are navigating the vehicle just to let it sit, parking spaces need only be large enough to accommodate the width of a vehicle plus space to open the door. Since it is unlikely that drivers adjacent to each other will open doors at the same time, the door can swing into the neighboring space. St. Louis, Missouri, adopted 7.5' x 15' as its parking space size — a small amount on an individual space basis, but this adds up when considering the thousands of parking spaces in a typical downtown.¹¹

Pricing & Payment

Price for 85% occupancy (CBD)

Pricing parking should follow the “Goldilocks Principle” — a price is too high if too many spaces are vacant, and too low if all spaces are filled.¹² An occupancy of 85 percent is a reasonable goal to aim for, as it ensures that a motorist can find a space without circling the block, but also means that, overall, the spaces are being well utilized.

No time limit (CBD)

If parking occupancy can be maintained near the targeted rate, time limits can be eliminated. Time limits hinder downtown’s “park once” goal and can hurt businesses by shooing them out of stores and restaurants before they are ready. If pricing alone can maintain consistent availability, time limits do nothing but instill customer anxiety.

Make payment easy (CBD)

While most drivers are willing to pay for parking, no one is willing to be inconvenienced to do it. If a metered system is implemented, it must be easy to use, meaning no one needs to find change to pay for a parking space. The City of Des Moines has transitioned its parking meter payment system to SmartCard, an example of making paying for parking customer friendly.

Promote Alternate Modes

Transit passes (Region)

For transit-accessible developments, provide free or reduced-cost transit passes to residents and employees. This can be used to adjust parking requirements. In Seattle, for example, if transit passes reducing costs by 50 percent are provided to all employees and transit is available within 800 feet of the development, parking requirements are reduced by 10 percent.¹³

Bicycle parking (Region)

Adopt a zoning code requiring bicycle parking at homes and places of work and shopping, to provide secure end-to-end bicycle storage. The City of Pittsburgh’s bike parking ordinance requires, for example, one parking space per three dwelling units in multi-family housing, and one space per 10,000 square feet of commercial.¹⁴

Carshare spaces (CBD)

Require developers to provide carshare spaces as a replacement to standard parking spaces. Devote a portion of on-street parking to carshare vehicles. In the City of Berkeley, for example, developments with 31-60 parking spaces must include two carshare spaces.¹⁵

11 Mid-America Regional Council. “Parking lots to parks.” <http://www.sustainableskylineskc.org/assets/ParkingLotstoParksbook-web.pdf>.

12 Tumlin, Jeffrey. Sustainable Transportation Planning. 2012.

13 Metropolitan Transportation Commission. Parking Code Guidance: Case Studies and Model Provisions. 2012. http://www.mtc.ca.gov/planning/smart_growth/parking/6-12/Parking_Code_Guidance_June_2012.pdf.

14 http://www.city.pittsburgh.pa.us/cp/assets/bicycle/Bicycle_Parking_Ordinance.1.pdf.

15 Require developers to provide carshare spaces as a replacement to standard parking spaces. Devote a portion of on-street parking to carshare vehicles. In the city of Berkeley, for example, developments with 31-60 parking spaces must include two carshare spaces.

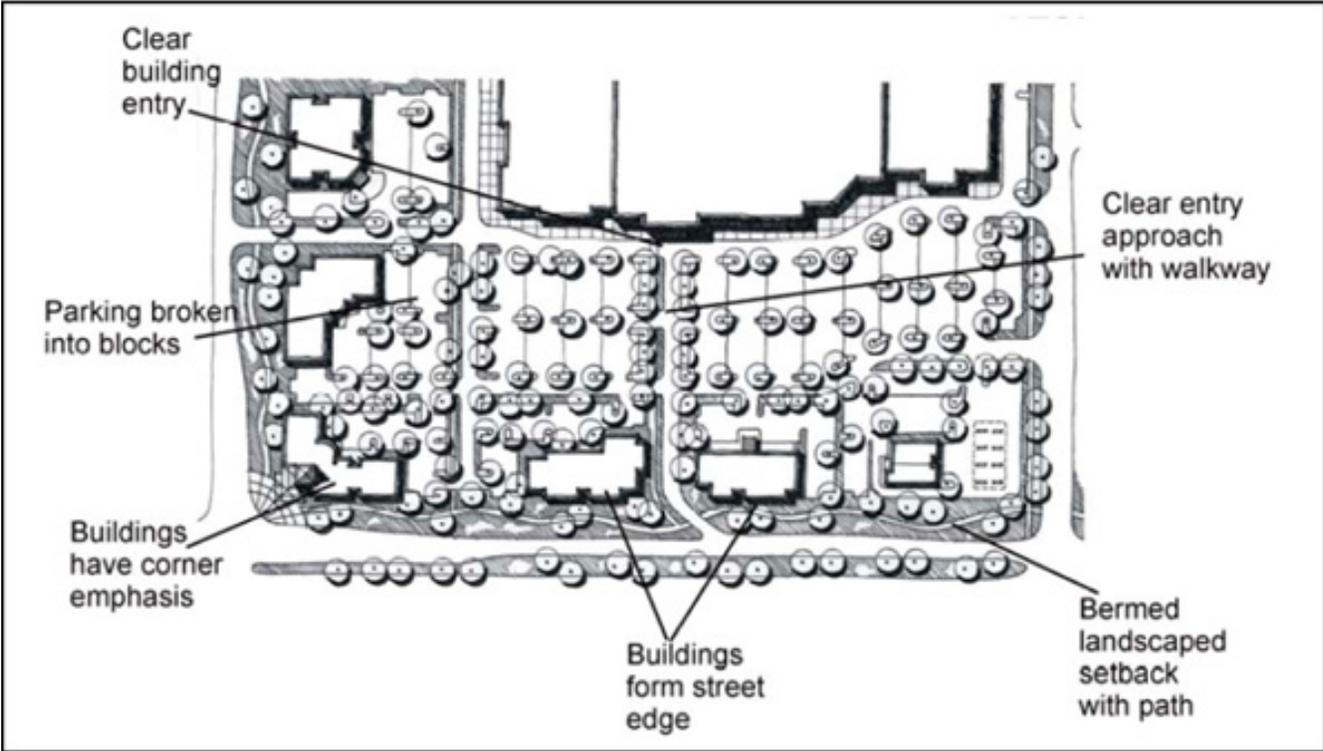
Sustainable, Walkable Design

Put the active use in front (Region)

Require developers to provide vehicle parking behind retail rather than in front, or adopt standards breaking up large parking areas and allowing infill along the street.



PARKING IN FRONT OF RETAIL FEELS DISCONNECTED.



MANY COMMUNITIES HAVE ADOPTED "BIG BOX" DESIGN STANDARDS. THIS GRAPHIC FROM OVERLAND PARK, KANSAS, SHOWS SMALLER BUILDINGS FRONTING THE STREET IN FRONT OF THE MAJOR RETAILER AND LANDSCAPED PARKING BROKEN UP BY WALKWAYS.

Pedestrian walkways (Region)

Parking lots should include clearly delineated walking paths and landscaping. Parking lot design should assume a posted speed of 5 mph and should group stalls in clusters of 500 separated by a landscaping buffer.¹⁶ Shrubs and hedges used as buffers are limited to 3 feet in height to maintain security. An example of walkways through parking is shown on the previous page. Landscaping reduces heat islands and adds permeable surfaces.

Landscape reserve (Region)

Landscape reserve consists of a percentage of new parking to be left as landscaping, land banked to be turned into parking only if needed. Some municipalities have adopted shade tree ordinances requiring a tree built per a certain number of parking spaces. In Sacramento, the ordinance requires that 50 percent of the parking lot be shaded by trees 15 years post-build.¹⁷

Porous pavement and stormwater basins (Region)

Parking lots are traditionally impermeable and thus generate surface run-off during rain events. As metropolitan areas develop more sophisticated and comprehensive stormwater management plans, parking lots and other infrastructure elements of sizable surface area are increasingly doing their part to minimize quantity and increase quality of stormwater runoff.

¹⁶ WMATA Station Access Guidelines, p 34.

¹⁷ http://www.cityofsacramento.org/dsd/planning/long-range/planning-library/documents/SHADING_GUIDELINES_06-17-03.pdf.

Recommended Transit Supportive Guidelines

Introduction

For transit to be effective, it requires more than just vehicles that carry riders and a bus schedule. Two additional elements can greatly alter a system’s effectiveness: design policies and land use/zoning. Design policies are integral elements to ensuring that people can identify and access the transit system, while land use and zoning policies help concentrate people and mix land uses to maximize transit’s effectiveness. When combined, design and land use policies not only increase transit’s ridership potential, but also its value as an economic development and sustainability tool.

The following guidelines are recommended to reap the maximum benefits of the transit services in the Des Moines metropolitan region.

Guidelines

Density

Successful bus transit generally requires a minimum of seven residential units per acre in residential areas and 25 employees per acre in commercial centers, and about two to four times as much for premium quality transit. Increased population and employment densities place more potential riders within walking distance of transit stops and higher densities, especially higher residential densities, are recommended depending on the type of transit serving the area. These densities create adequate transit ridership to justify frequent service and help create active street life and commercial activities, such as grocery stores and coffee shops, within convenient walking distance of homes and worksites.

RECOMMENDED RESIDENTIAL DENSITY THRESHOLDS

TRANSIT MODE	MINIMUM DWELLING UNITS PER ACRE
Basic Bus Service	7-15
Premium Bus Service	15-18

Source: Transportation Cooperative Research Program, Report 102: Transit-Oriented Development in the United States: Experiences, Challenges, and Prospect (2004).

Commercial land uses require employment density as well as Floor to Area Ratio (FAR). Recommended FAR’s start at 0.35 for nonresidential activities in transit supportive neighborhoods, but are more frequently recommended at minimums of 0.5 to 1.0 for commercial developments without structured parking and at least 2.0 for developments with structured parking. An employment density of 25 jobs per gross acre (15,000 jobs within a 1/2-mile) will support frequent, high capacity transit service.

High-quality transit supports the development of higher-density centers, which can provide accessibility and agglomeration benefits (efficiencies that result when many activities are physically close together). Conversely, automobile-only transportation systems conflict with urban density because it is space intensive, requiring large amounts of land for roads and parking facilities. Large scale park and ride facilities without other uses tend to conflict with transit supportive neighborhoods, since a bus station surrounded by large parking lots and arterials with heavy traffic is unlikely to provide the densities needed to generate sufficient transit demand. It is therefore important that such facilities be properly located, designed, and managed to minimize such conflicts, and sited where they can accommodate transit without impacting the development potential of the area.

Mixed-Uses

Traditional zoning separates land uses, sets density thresholds and minimum lot sizes, and usually contains explicit regulations such as bulk and height controls and minimum parking requirements. To support transit, however, these elements of traditional zoning are often inverted. For instance, uses are intermixed, not excluded, and parking caps, rather than parking minimums, are sometimes set.

To support transit, especially around high capacity stations, a municipality can create a special zone or change existing classifications. More common than either rezoning or new designations, however, is the creation of an overlay zone. As its name implies, an overlay zone is placed on the zoning map over a base zone. The overlay modifies, eliminates, or adds regulations to the base zone. Overlays provide for effective land-use control without increasing the complexity of the regulations.

Besides identifying land uses that encourage non-transit trips, like automobile repair shops, transit supportive zones often specify activities that are permitted as-of-right. The uses included in a transit supportive community should generate trips throughout the day. This strategy takes advantage of unused transit supply in off-peak hours and results in routes that are more productive than in areas with traditional rush-hour peaks. Ideally, the new zone generates approximately 1 to 1.5 jobs per household, providing significant employment opportunities for both residents and commuters.

The following list presents a sample of land uses appropriate for inclusion in a transit supportive district:

- Mid- to high- density residential
- Retail stores
- Banks
- Private offices/professional businesses
- Government offices
- Schools (especially higher education)
- Child-care centers
- Community facilities
- Public space
- Entertainment complexes

Pedestrian Orientation

Pedestrians who can walk to different land uses in under 10 minutes are more likely to utilize those sites, including retail establishments, parks, and community facilities. Placing daily goods and services, as well as recreational destinations, within walking distance of residences increases the incentive to use alternative modes, supporting transit use for commuting and other regional travel. The following recommendations outline the key design factors which focus development on pedestrians:

- Locate active uses that generate a higher number of daily trips on the first two floors. These should include retail and open space located in the first 15-20 feet of building height. Land uses which generate fewer trips should occupy higher floors.
- Bring sidewalks up to the building line and prohibit parking from being located between the sidewalk and the building.
- Curb cuts are extensions of sidewalks. Design sidewalk-driveway interfaces to be identical to sidewalks (e.g. the sidewalk material and level should continue across the driveway). This alerts both pedestrians and drivers that they are traveling on a portion of the sidewalk.
- Install bollards, trees, and other street furniture to protect pedestrians and buildings from errant drivers.

- Sidewalks should be to at least five feet wide at all points.
- Install curb extensions at all corners with on-street parking.
- Install pedestrian signals at all traffic signals.
- Automatically actuate the pedestrian phase within traffic signals instead of using pedestrian-actuated signals.
- Include Leading Pedestrian Intervals at all signals, which allow pedestrians a few seconds' start ahead of traffic entering the intersection.

Access and Connections

For transit to be successful, pedestrians must be able to easily access the service and easily walk to their destination when they disembark. The following elements outline the vehicular and pedestrian policies recommended for promoting a safe and easily accessible pedestrian environment:

- Reduce vehicular roadway lane widths to no more than 11 feet per lane. Never require pedestrians to cross more than three lanes without a protected refuge.
- Rededicate any reclaimed roadway space to install or widen sidewalks, crosswalks, and bike lanes.
- Reduce the number of conflict points between motorized and non-motorized modes. Where conflict points are unavoidable, ensure that non-motorized modes have clearly delineated pathways and that drivers are aware of their responsibility to share the road.
- Increase road and path connectivity, with non-motorized shortcuts, such as paths between cul-de-sac heads and mid-block pedestrian links.
- Adhere to and exceed the requirements of the Americans with Disabilities Act.
- Include street furniture like benches and design features such as human-scale street lights without blocking traveler's "desire lines" (paths which travelers use, whether designated or not).
- Guide motorized modes to operate at appropriate speeds and along appropriate routes for each location.
- Provide bicycle parking and amenities such as lockers, showers, and access routes to connect with all transit facilities.
- Determine parking standards as one component of overall multimodal accessibility options, not as the only mechanism to access a site.

The following table compares various modes in terms of their priority — based on whether they help provide basic mobility or tend to be more recreational uses — and performance — size and speed. Below are explanatory examples:

- Higher-priority modes should have the right-of-way over lower-priority modes. For example, recreational modes (such as skateboards) should yield to modes that provide basic mobility such as walking and wheelchair users if conflicts exist.
- Lower-speed, smaller modes should be given priority over higher-speed, larger modes. For example, bicycles should yield to scooters, and scooters should yield to walkers.
- Maximum speeds should be established for each mode, based on the physical design of the facility (i.e., some facilities may only accommodate 10 mph cycling, while others can accommodate 15 mph cycling). Maximum allowable speeds should decline as a pedestrian facility becomes more crowded or narrower.

- If facilities cannot accommodate all potential modes, higher-priority modes should be allowed and lower-priority modes should be required to use roadways. For example, cycling and skating may be allowed on pedestrian facilities at uncrowded times and locations, but not at busy times and locations.
- Special efforts should be made to accommodate a wide range of users, including cyclists, skaters, and runners, where there are no suitable alternative routes. Adjacent roadways are unsuitable for such modes.

NON-MOTORIZED FACILITY USERS COMPARED

USER TYPE	SPEED	SIZE (WIDTH)		RISK TO OTHERS	PRIORITY
People standing or sitting	None	Low	None	Minimal	High
Walkers	Low	Narrow	High	Minimal	High
Walkers with children	Low	Medium to large	Medium to low	Moderate	High
Walkers with pets	Low	Medium to large	Medium to low	Moderate to High	Medium
Human powered wheelchairs	Low	Medium	Low to medium	Minimal	High
Motor powered wheelchairs	Medium	Medium	Medium	Moderate	High
Joggers and runners	Medium to high	Narrow	Medium	Moderate	Medium
Skates, skateboards and push-scooters	Medium	Medium	Medium	Moderate to High	Low
Powered scooters	Medium	Medium	Medium	Moderate to High	Medium
Handcarts, wagons and pushcarts	Low	Medium to large	Low to medium	Moderate to High	Medium
Human powered bicycle	Medium to high	Medium to large	Medium to low	Moderate to High	Medium
Motorized bicycle	High	Medium to large	Medium to low	Moderate to High	Low
Equestrians	Medium to high	Large	Low	Moderate to High	Low

Source: Victoria Transport Policy Institute, 2005.

Transit Infrastructure and Amenities

Bus stops that are easy to find and use are critical to passengers getting on and off the vehicle. Adequate pedestrian accessibility and enhanced passenger amenities at bus stops are critical to attracting people to transit. Provision of stop infrastructure is frequently tied to the number of riders who board and alight at each stop. The greater the number of riders, current or planned, the greater the capital investment.

- All stops should have:
 - A level concrete pad
 - Reliable pedestrian access
 - Adequate lighting for safe and comfortable night use
 - Route and schedule information
- Stops with a medium number of boardings (including transfers) should have:
 - Bus shelter with bench
 - System map
 - Trash receptacles
- Stops with a high number of boardings (including transfers) should also have:
 - “Super stop” shelter
 - Real time travel information

These amenities support transit service by making the bus riding experience comfortable and convenient. As described in TCRP Report 46: The Role of Transit Amenities and Vehicle Characteristics in Building Transit Ridership, provision of certain physical amenities will draw more riders. The TCRP study was built around the Transit Design Game Workbook, a survey distributed to bus passengers in five cities: Rochester, New York; Ann Arbor, Michigan; Aspen, Colorado; Portland, Oregon; and San Francisco, California. The survey allowed people a budget of 12 to 18 points to spend on amenities, and also had the respondents weigh spending money on amenities or lowering the fare.¹⁸ Spending 18 points on amenities roughly equated to \$450,000 in annualized costs for a 300-bus system, and resulted in a 1.5 to 3 percent increase in ridership. A study by the University of North Carolina at Charlotte also has indicated that improved bus stop amenities increases ridership.¹⁹

Another important component of bus stops consists of safety and security measures, which increase transit effectiveness. Safety and security requires transit operators to provide a predominantly controlled environment so riders perceive that the agency is protecting them. In addition, it also requires emergency planning for when uncontrolled events occur, so that responses are planned and procedures are in place to answer unforeseen incidents. These preparations provide riders with both an actual and perceived safe environment, preventing public concerns that would limit the effectiveness of the transit system.

Providing a safe and secure environment requires a combination of design features, response plans, evaluation of public perception, and coordination between the multiple transit services and levels of government. All stops should be well-lit and provide clear sight lines with no blind spots. Placement of stops in view of active uses is recommended. Wherever possible, stations and stops should be accompanied by clearly marked crosswalks and traffic control devices to provide a safe, controlled roadway crossing.

¹⁸ TCRP. Transit Design Game Workbook (Part of TCRP report 46). 1999.

¹⁹ “Understanding How the Built Environment Around TTA Stops Affects Ridership: A Study for Triangle Transit Authority.” UNC Chapel Hill Department of City and Regional Planning, Dec. 2006.

Stop Location

Transit stops may be placed at intersections or mid-block. Connecting bus routes, significant trip generators, and the urban form of the destination will all impact the locations of stops.

On urban streets where traffic is intended to travel 35 mph or less, buses should stop in the travel lane rather than pull out of traffic, since pulling out results in bus delay and merge conflicts as the bus re-enters the travel lane. Wherever on-street parking is present, use a curb extension to delineate bus stop spaces.

There are three choices for location of bus stops: near-side, far-side, and mid-block. Near-side stops are located on the approaching side of an intersection in relation to the direction of travel. Far-side stops are located on the departing side. Mid-block stops are not close enough to an intersection to be affected by the intersection. Far-side stops are generally more desirable than near-side stops from the perspective of the pedestrian and motor vehicle operators, but near-side stops can be successfully designed to adequately accommodate pedestrians. Bus stop locations are not limited to only one correct placement; multiple options may work for any individual placement. During the detailed planning, the following outline can be used to help participants locate the optimal locations for each bus stop.

Far-Side Stop Advantages

- Minimizes conflicts between right-turning vehicles and buses
- Provides additional right turn capacity
- Minimizes sight distance problems on approaches to intersection
- Encourages pedestrians to cross behind the bus
- Creates shorter deceleration distances for buses since the bus can use the intersection to decelerate
- Results in bus drivers being able to take advantage of the gaps in traffic flow that are created at signalized intersections

Far-Side Stop Disadvantages

- May result in the intersections being blocked during peak periods by multiple buses stopping at the same stop (may not be an issue along streets with one route and spaced headways)
- May obscure sight distance for crossing vehicles
- May increase sight distance problems for crossing pedestrians
- Can cause a bus to stop far side after stopping for a red light, which interferes with both bus operations and all other traffic
- May increase number of rear-end accidents since drivers do not expect buses to stop again after stopping at a red light
- Could result in traffic queued into intersection when a bus is stopped in travel lane

Near-Side Stop Advantages

- Minimizes interferences when traffic is heavy on the far side of the intersection
- Allows passengers to access buses closest to crosswalk
- Allows passengers to see route destination on front of bus when crossing at intersection
- Results in the width of the intersection being available for the driver to pull away from curb

Near-Side Stop Disadvantages

- Increases conflicts with right-turning vehicles
- May result in stopped buses obscuring curbside traffic control devices and crossing pedestrians
- Increases sight distance problems for crossing pedestrians

Mid-block Stop Advantages

- Minimizes sight distance problems for vehicles and pedestrians
- Minimizes impacts to all movements at intersections
- May results in passenger waiting areas experiencing less pedestrian congestion

Mid-block Stop Disadvantages

- Requires additional distance for no-parking restrictions
- Encourages patrons to cross street at mid-block (jaywalking)
- Increases walking distance for patrons crossing at intersections

Electric Vehicle Infrastructure Recommendations

Electric Vehicles (EV) need a much different type of fueling network than gasoline engine vehicles. This new fueling system will be based on a clustering of strategically placed charging stations at homes, workplaces, and retail stores instead of the traditional quick fueling system used with gas stations today. This way of "fueling" will be quite a paradigm shift for most metro consumers.

Recommendation 1: Publicly Site Charging Stations

A strong network of publicly-available Level 2 charging stations is needed to encourage more plug-in electric vehicle (PEV) purchases in the Des Moines metro area. Various business and government sites are suitable for a charging station. An ideal location is convenient and highly visible to a large number of potential PEV drivers. The MPO's Electric Vehicle Readiness Study includes maps of ideal locations for Electric Vehicle Supply Equipment (EVSE) installation for each of its 17 member communities based on the number of destination locations such as retail stores, parks, theatres, and restaurants within the Traffic Analysis Zones. Each map displays high density areas of ideal businesses where travelers tend to stay parked for at least an hour.

The MPO recommends each municipal government install at least one EVSE in each high density location. Local city planners can assess the ideal specific local within this destination area such as finding an ideal host. Many organizations can host Level 2 charging stations including:

- Parking garages
- On-street parking
- Retail Stores
- Stadiums and sports complexes
- Movie theaters
- Destination parks, zoos, and museums
- University

Charging station ownership and payment systems vary. Many stations are currently publicly funded and offer free charging to encourage early adopters of PEVs. Payment systems will evolve as use becomes more mainstream.

Recommendation 2: Incentivize Local EVSE Installation

There are three main tools a city can use to encourage or even require the installation of EVSE on private property and the focus should be placed on multi-unit residences, workplace sites, and key inter-metro sites.

Site Types

Multi-Family Home

Multi-unit residences are a major obstacle to EV ownership. Residents may choose a location to live based on EV availability. An EV owner in a single family residence can easily install an EVSE. It can be as simple as hiring a contractor to install a new outlet. This is not the same for a resident of multi-unit dwelling that would need to work through a landlord, building management, or home owners association. Special consideration should be given to requiring apartments and condominiums, etc. to install a Level 2 EVSE for 2-5% of the parking.

Working

According to the Electric Power Research Institute, the workplace is the second most frequented location for charging after a PEV driver's home. This is because vehicles tend to stay parked at a workplace on average 8 to 9 hours. Workplace charging may also be an

alternative to residential charging for drivers that may not have charging available in their homes if they live in a multi-unit dwelling, have a detached garage with no electricity, etc. The MPO's Electric Vehicle Readiness Study mapped locations with a high number of employees to locate dense workplace zones to assist planners to focus on workplace charging initiatives.

Inter-Metro Sites

To complete the EVSE network, a few fast charging sites will be necessary to extend the range for drivers. PEV drivers want more fast chargers to be available. This charging equipment can provide an 80 percent charge in as little as 30 minutes. It will service the needs of inter-regional and intra-regional travel and also provide a "safety net" charging network for all PEV drivers in the Des Moines metro area. The MPO has mapped areas for optimal fast charging stations Electric Vehicle Readiness Study.

Site Types

Site Design and Parking Ordinances

Residential: Update ordinances to strongly encourage, if not require, new multiple-family homes be constructed to provide a 220-240-volt/40 amp outlet on a dedicated circuit and in close proximity to designated vehicle parking to accommodate the future hard wire installation of a Level 2 EVSE. Due to the fact that 60% to 70% of electric vehicle charging will happen at the owner's home at night, it will be easier to install the dedicated electrical line now vs retrofitting a building in the future.

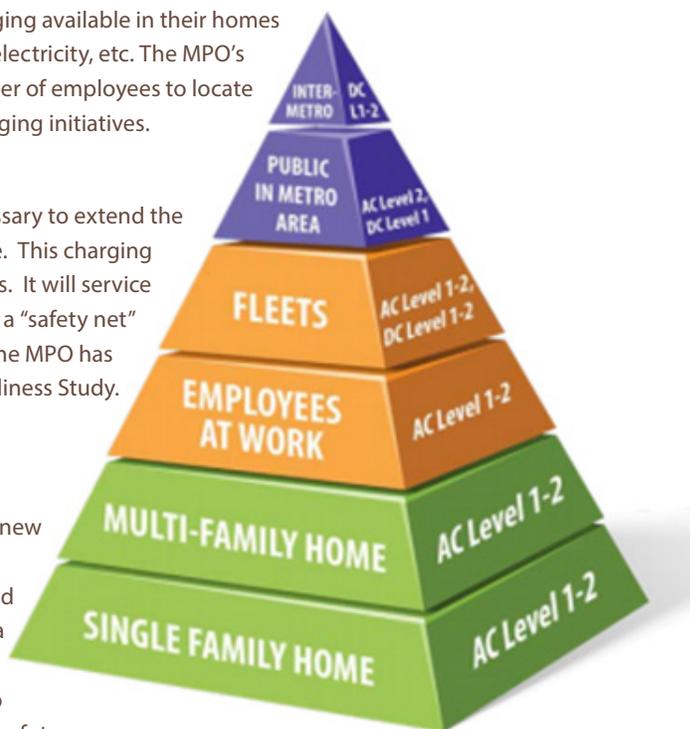
Non-Residential: Update ordinances to strongly encourage, if not require, new and expanding non-parking areas to proactively provide the electrical capacity necessary to accommodate the future hard wire installation of Level-2 electric vehicle charging stations in order to accommodate future growth in demand for EV. It is recommended that a minimum ratio of 2% of the total parking spaces be prepared for charging stations. Ordinances may also speak to site design requirements, signage, ability for police to remove illegally parked vehicles, etc. See Resource section for links to example ordinances from other communities.

Pre-App Meetings: Cities that conduct pre-app meetings should consider adding this to the check-list of considerations discussed with potential development projects.

Tax Abatement

Tax abatement is offered as an encouragement to commercial projects that exemplify a commitment to improve the character of the commercial areas throughout the region. Most communities have standards and some offer a menu of options including those focused on sustainability. The MPO recommends adding the option to install Level 2 EVSE charging stations (not just the wiring) to serve a minimum of ration 2% of the plan's total parking spaces. Other incentives communities have implemented include:

- Low-cost EVSE permits
- Same-day inspections
- Stream-line electrical permitting

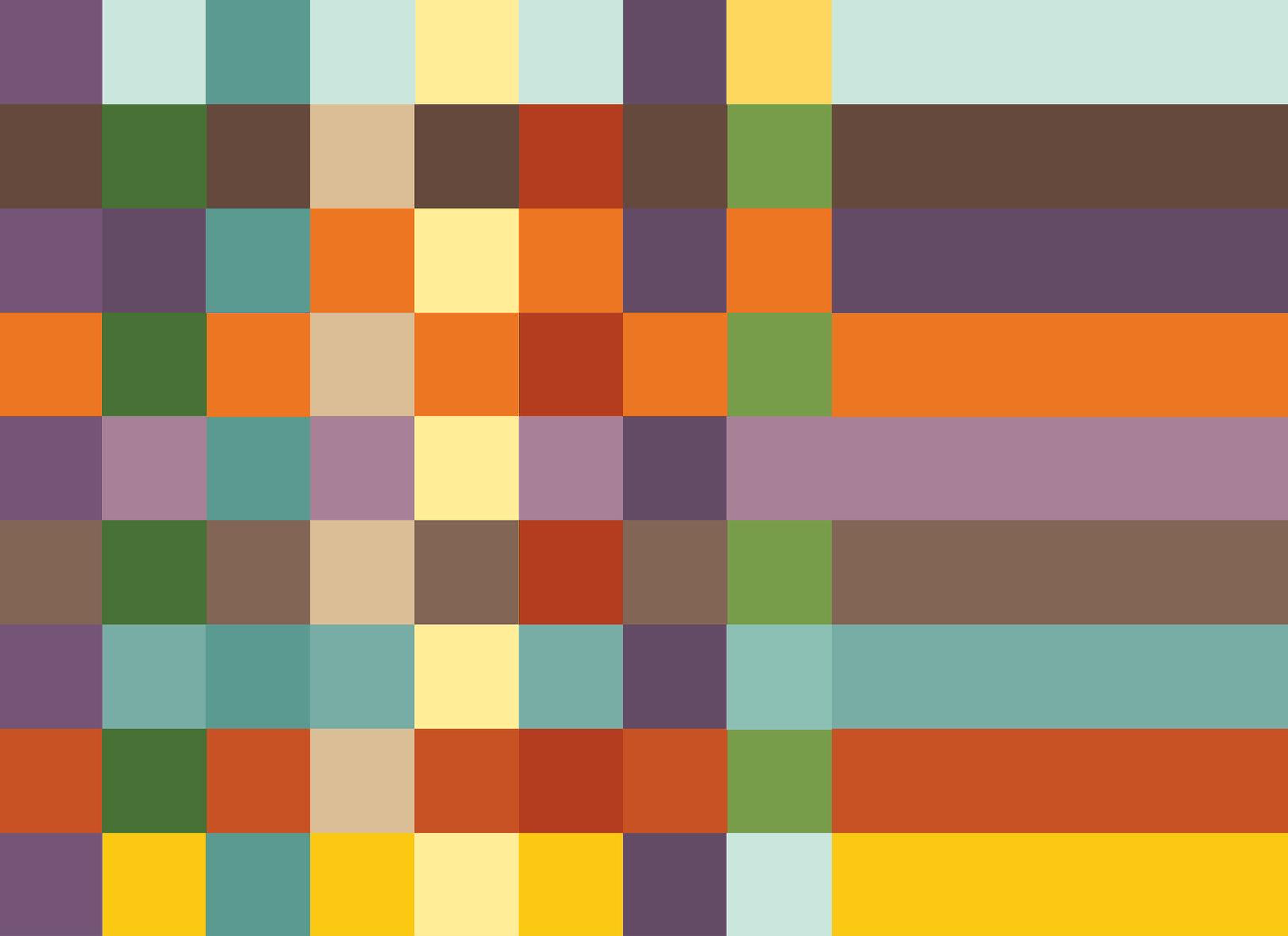


Recommendation 3: Comprehensive Plan & Code Updates

To ensure EV-friendly local government commitment through ordinances and zoning, the MPO encourages including EVs and EVSE in local comprehensive plans. Most city codes do not represent a significant barrier to EVSE installation, but adopting EV-friendly codes can encourage EVSE deployment. The plan could include new zoning ordinances to address the following:

- Define what types of EVSE are allowable by land use type
- Request developers install EVSE or wiring for future EVSE installation with new developments or significant renovations
- Establish design criteria for EVSE installations
- Provide density bonuses for EVSE installations
- Set performance measurements or target number of EVSE for the region





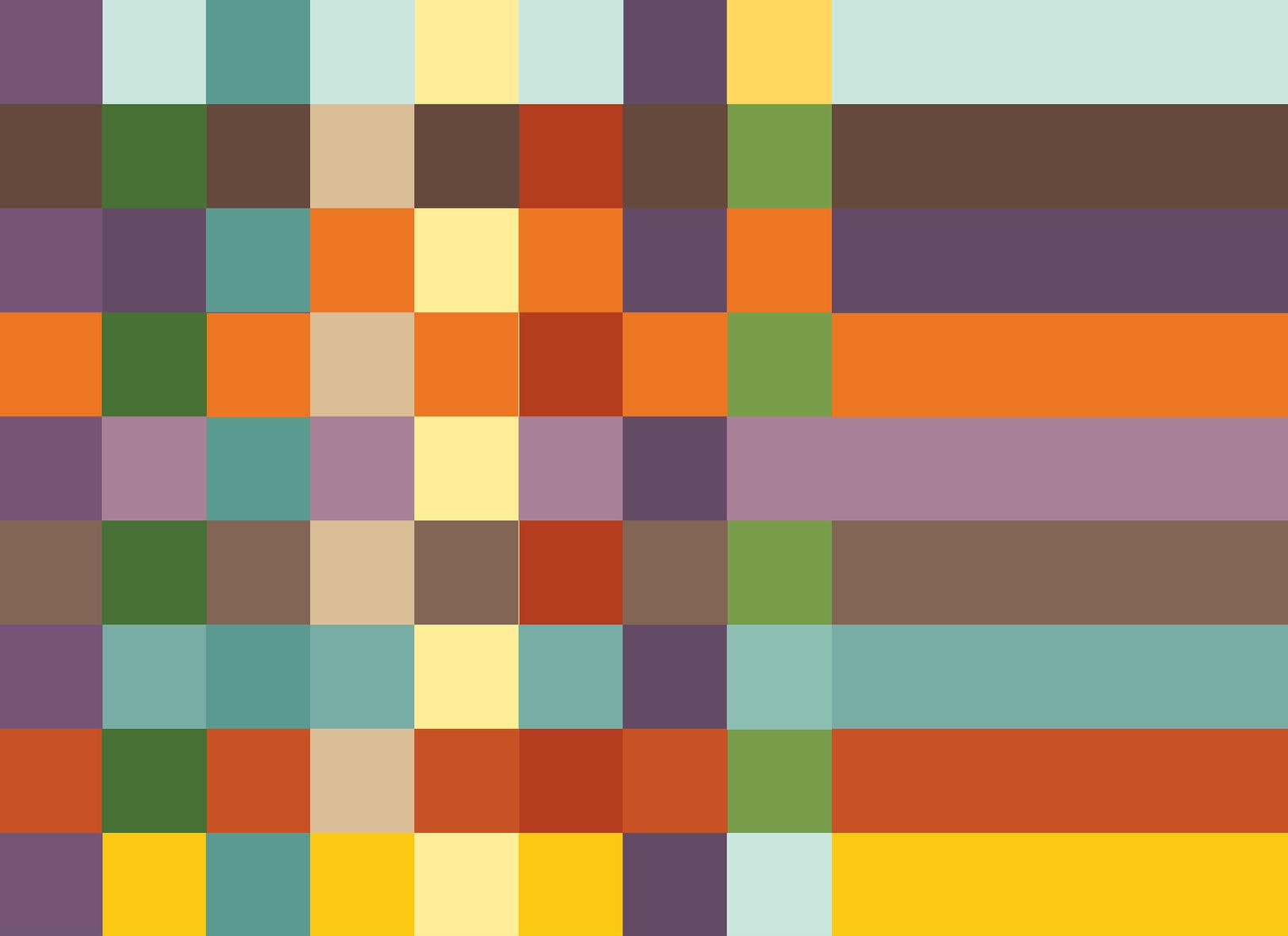


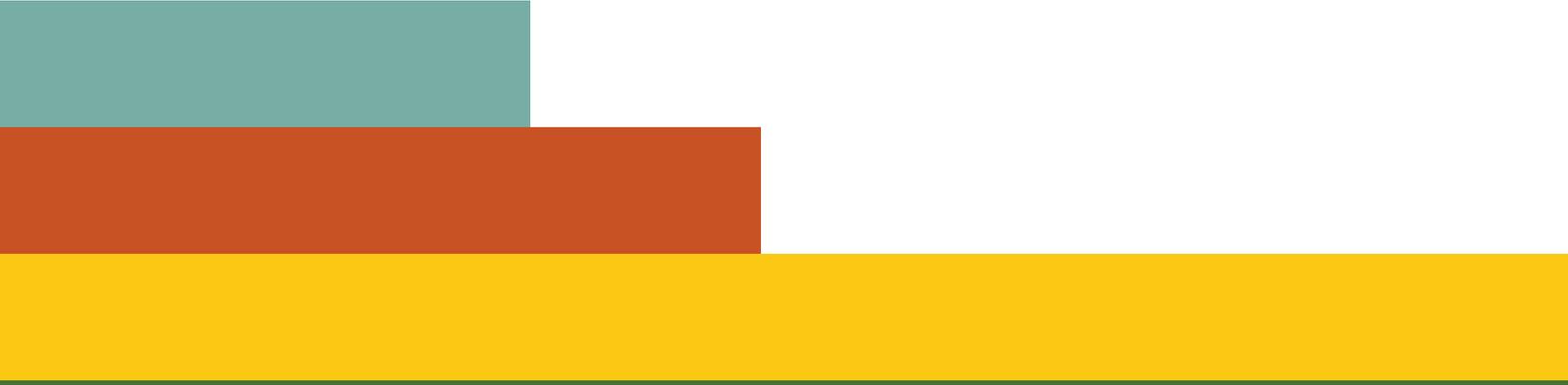
APPENDIX A: ACRONYMS

Acronyms

ACRONYM	DEFINITION
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
ALP	Airport Layout Plan
ARRA	American Recovery and Reinvestment Act of 2009
BRT	Bus Rapid Transit
CBD	Central Business District
CETA	Comprehensive Employment and Training Act
CIRALG	Central Iowa Regional Association of Local Governments
CIRPC	Central Iowa Regional Planning Commission
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CMAT	Crash Management Mapping Analysis Tool
DART	Des Moines Area Regional Transit Authority
DEMO	Demonstration Funding
DLPM	Durable Liquid Pavement Markings
DMATC	Des Moines Area Transportation Planning Committee
DOT	Iowa Department of Transportation
DSM	Des Moines International Airport Code
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
FAR	Floor Area Ratio
FHWA	Federal Highway Administration
FLAP	Federal Land Access Program
FTA	Federal Transit Administration
HIRTA	Heart of Iowa Regional Transit Agency
HSIP	Highway Safety Improvement Program
HTF	Highway Trust Fund

ACRONYM	DEFINITION
HUD	US Department of Housing and Urban Development
InTrans	Institute for Transportation
ITE	Institute of Transportation Engineers
LOS	Level of Service
LRTP	Long-Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21st Century Act
MPA	Metropolitan Planning Area
MPO	Metropolitan Planning Organization
NACTO	National Association of City Transportation Officials
NAI	No Adverse Impact
NHPP	National Highway Performance Program
PCI	Pavement Condition Index
PEV	Plug-in Electric Vehicle
RUTF	Road Use Tax Fund
SLM	Shared Lane Markings
STA	State Transit Assistance
STP	Surface Transportation Program
STP-HBP	Surface Transportation Program Highway Bridge Program
SUDAS	Statewide Urban Design and Specifications Manual
TAP	Transportation Alternatives Program
TIF	Tax Increment Financing
TIP	Transportation Improvement Program
TTP	Tribal Transportation Program
USC	US Code
USFWS	US Fish & Wildlife Service
VMT	Vehicle Miles Traveled
Y-O-E	Year-of-Expenditure





APPENDIX B: STATE OF THE TRANSPORTATION SYSTEM

STATE OF THE CURRENT TRANSPORTATION SYSTEM

Appendix B documents existing and proposed conditions for the transportation network, with a profile of each major travel mode (roadway, transit, pedestrian, bicycle), plus a description of the region's popular trail system.

In the Des Moines Metropolitan Planning Area (MPA), 92 percent of person trips are made using a personal vehicle. At the same time, a robust network of transit, including not just local fixed-route but also demand-response service, an active carpool culture, and multiple Transportation Demand Management programs, provide valuable opportunities for a more multimodal future system. Today, the average vehicle trip within the MPA takes 25 minutes and covers a distance of 15 miles. As shown in Figure B1, commute methods to work are overwhelmingly by private auto. The rate of vehicle ownership, in turn, is high, with just 5.1 percent of occupied housing units without a vehicle available. In comparison, the United States overall has 8.9 percent of households that do not have a vehicle.

FIGURE B1: MODE OF TRANSPORTATION TO WORK AND VEHICLES AVAILABLE

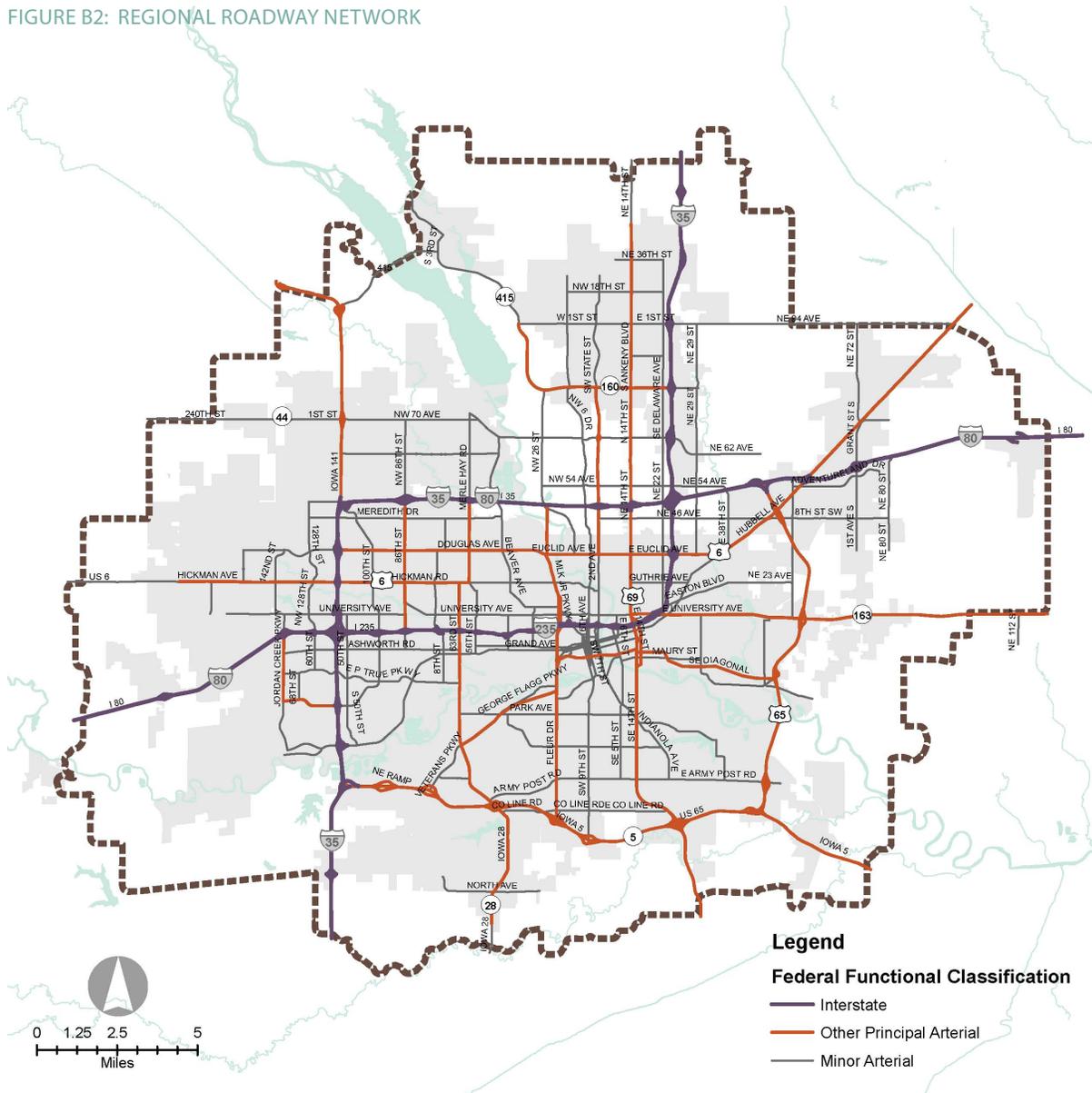
	DALLAS COUNTY	MARGIN OF ERROR	POLK COUNTY	MARGIN OF ERROR	WARREN COUNTY	MARGIN OF ERROR
Total Labor Force (Employed, Age 16+)	37,140	666	245,184	1,487	26,111	383
Workers 16 Years and Over	35,207	693	226,602	1,509	24,234	417
Car, Truck, or Van -- Drove Alone	30,033	740	184,876	1,931	19,750	517
Car, Truck, or Van -- Carpooled	2,830	378	23,455	1,274	2,271	325
Public Transportation (Excluding Taxicab)	100	63	3,484	392	112	78
Walked	282	83	3,867	495	542	140
Other Means	305	164	2,279	315	146	71
Worked at Home	1,657	274	8,641	618	1,413	220
Mean Travel Time to Work (Minutes)	20.6	0.6	18.7	0.2	25.3	0.9
Occupied Housing Units	25,561	312	171,227	952	17,265	254
Households without a Vehicle	665	152	10,501	543	519	116

Source: US Census Bureau, 2008-2012 American Community Survey 5-Year Estimates

Existing

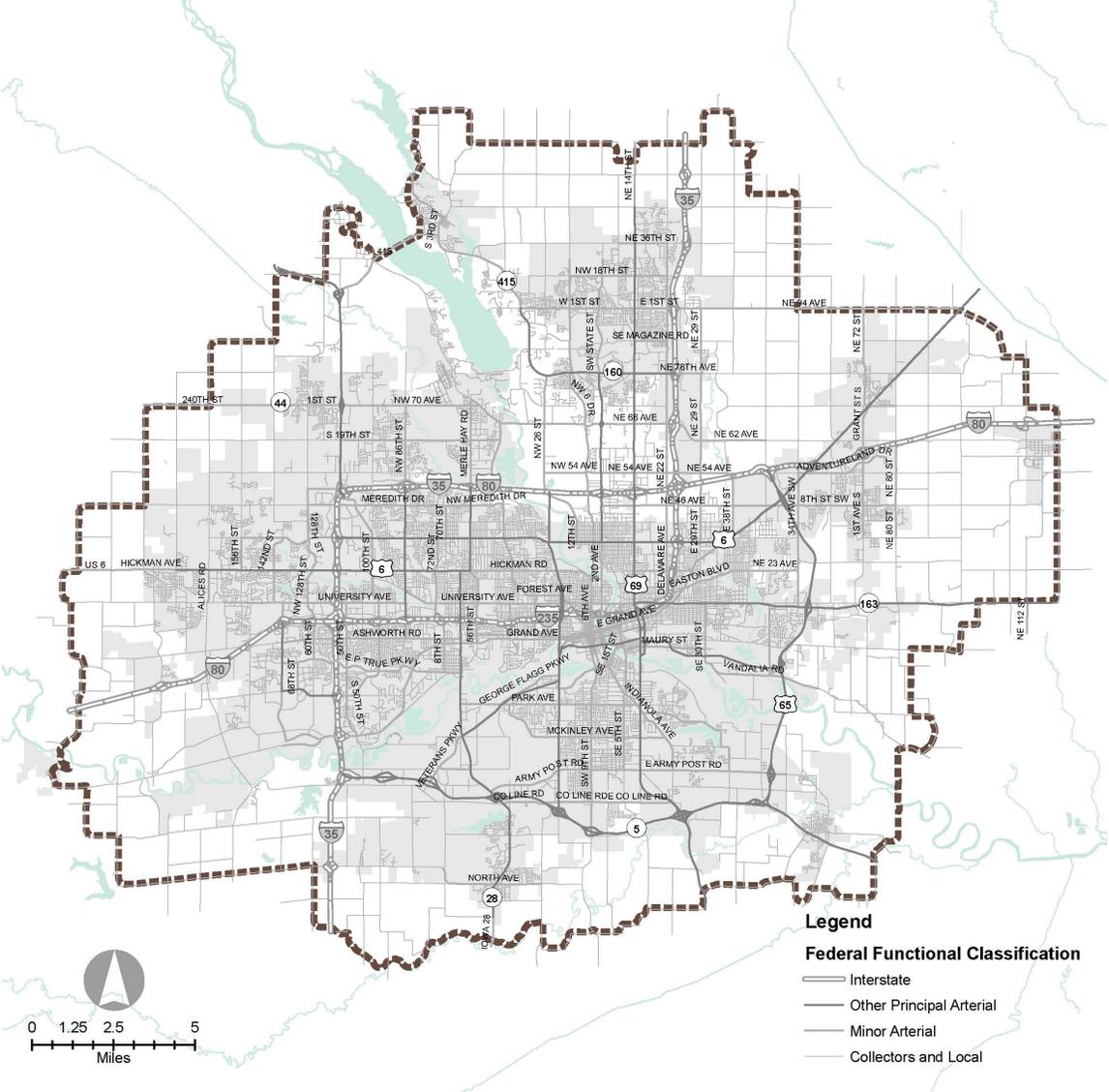
The MPA's roadway network includes highways that connect within and outside of the region, as well as an extensive local, internal roadways network. The regional interstate highway system includes I-35, which travels south from Minneapolis, past Ankeny, then turns and travels west, then south again through Urbandale, Clive, and West Des Moines south to Kansas City. I-80 travels east from Omaha and merges with I-35 north. I-235 runs along the north border of the Central Business District (CBD) subarea then curves north and turns into I-80 again after crossing I-35, then heads east to Iowa City. US Highways include 6, 65, and 69. Highway 6 runs east-west along the border between the Northwest and Southwest Suburbs. US Highway 69 travels north-south along the east side of the CBD and highway 65 arrives from the northeast then heads south and west to overlap with Iowa Highway 5. East-west Iowa Highways include numbers 415, 44, 48, and 163, while north-south routes include 141, 28, and 316. At the regional level, streets classified as principal arterials or minor arterials serve medium to long distance trips between neighborhoods or cities. Figure B2 shows the regional road network. The MPA's population is concentrated within the polygon created by I-35, I-80, Iowa Highway 5, and US Highway 65. Employment density is highest in downtown Des Moines and around the I-35/80/235 interchange.

FIGURE B2: REGIONAL ROADWAY NETWORK



The regional system is supported by a network of collectors and local streets. Collectors provide circulation within neighborhoods, and local roads provide direct access to land uses (such as homes). Figure B3 shows the collector and local network. As described, most collectors are short links within cities. The local network helps illustrate the higher use development patterns and developed areas within the region's cities (especially Des Moines, West Des Moines, and Ankeny). Places like Norwalk, Bondurant, Grimes, and Waukee contain considerable open space or undeveloped land and, therefore, less dominant roadway networks. A few developed but unincorporated areas exist between Des Moines and Ankeny, also with smaller roadway presence.

FIGURE B3: COLLECTOR AND LOCAL ROADWAY NETWORK



Within the MPA, there are a total of 3,006 miles of roads. As with any hierarchy, the various road types make up different percentages of the overall road system. A city of all principal arterials would allow no room for walking, while a city made of only collectors would not provide long-distance mobility. Figure B4 summarizes the percent each functional classification represents in the metropolitan region compared against federal statistics. The figure shows that the Des Moines Area MPA falls within typical functional classification percentages in urbanized areas, with the primary circulation network of local roads comprising more than two-thirds of all roads.

FIGURE B4: COMPARISON OF MPA ROAD SYSTEM TO FHWA URBAN AREA STANDARDS

	EXISTING	PERCENT	STANDARD
Interstate	69	2%	5-10%
Other Freeways & Expressways	176	6%	
Other Principal Arterials	336	11%	
Minor Arterial	222	7%	10-15%
Collectors	228	8%	5-10%
Local	1975	66%	65-80%
Classified	3,006	100%	

Source: Des Moines Area MPO; FHWA Federal Functional Classification Guidelines

Vehicle Miles of Travel (VMT) is a data point collected by Iowa Department of Transportation (DOT) and represents total miles traveled on rural and municipal roads for all users. Figure B5 shows VMT changes from 2005 to 2010 for each county in the Des Moines Area MPA as well as the state. In both Dallas and Warren Counties, rural road VMT decreased, while travel on municipal roads showed significant increase. Overall VMT change in Polk County was 2.5 percent. Over 5 years, this represents 0.4 percent more VMT per year.

FIGURE B5: TOTAL VEHICLE MILES TRAVELED BY ROAD TYPE

	RURAL VMT (2005)	RURAL VMT (2010)	% CHANGE	MUNICIPAL VMT (2005)	MUNICIPAL VMT (2010)	% CHANGE	TOTAL VMT (2005)	TOTAL VMT (2010)	%
Iowa	18,622,380	18,628,545	0.03%	12,945,382	12,950,811	0.04%	31,567,762	31,579,356	0.04%
Polk County	922,742	990,910	7.39%	3,010,811	3,030,974	0.67%	3,933,553	4,021,884	2.25%
Dallas County	433,216	430,168	-0.70%	191,124	219,672	14.94%	624,340	649,840	4.08%
Warren County	411,494	390,211	-5.17%	130,639	163,367	25.05%	542,133	553,578	2.11%

Source: Iowa DOT, Vehicle Miles Traveled 2010, <http://www.iowadot.gov/maps//msp/vmt/countyvmt10.pdf>

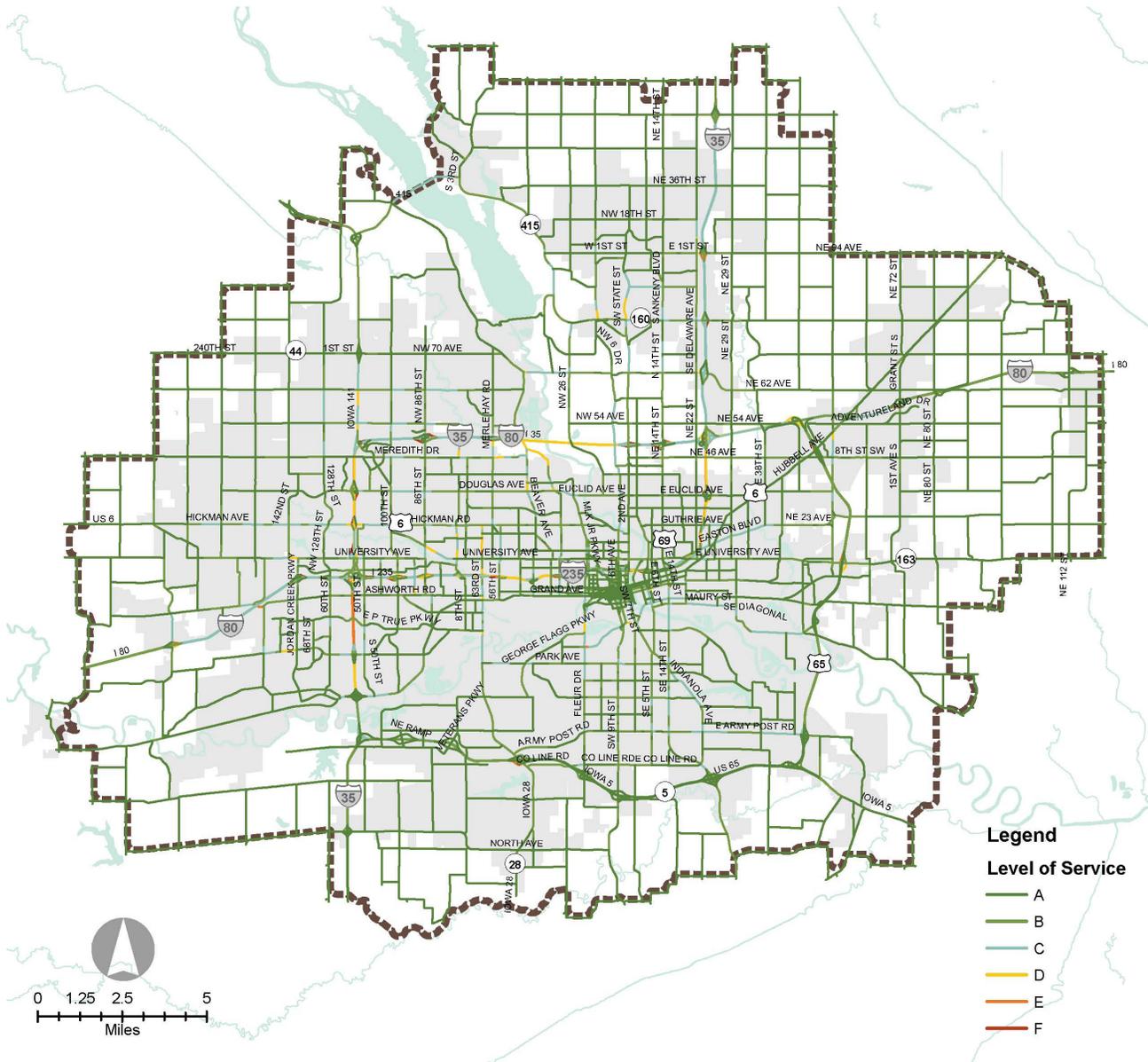
Level of Service (LOS) is a commonly-used indicator of vehicle delay, as it is a ratio of vehicles to road capacity. The LOS outcome is a letter ranking from A to F, with A designated for road links where less than half the capacity is being used, and F for links where the vehicle to capacity ratio exceeds 1.35. It is important to keep in mind that the A through F ranking does not correspond to a best to worst designation, as that is a judgment based on surrounding land uses and community priorities.

In 2010, 27 miles (or 2 percent) of the MPO's 1,480 miles of streets operated at LOS E or F. Without any future improvements to the street system, the travel demand model forecasts that 132 miles (or 9 percent) of the road network will operate at LOS E or F by 2050. Figure B6 shows forecasted LOS changes from 2010 to 2050. The MPO's travel demand model LOS projections for 2010 can be used as a proxy for current conditions, and is shown below in Figure B7.

FIGURE B6: LOS CHANGES FROM 2010 TO 2050 UNDER EXISTING CONDITIONS

	2010		2050	
	MILES	PERCENT	MILES	PERCENT
LOS A	968	65%	549	37%
LOS B	293	20%	298	20%
LOS C	148	10%	344	23%
LOS D	44	3%	151	10%
LOS E	18	1%	87	6%
LOS F	9	1%	45	3%
Total	1,480		1,474	

FIGURE B7: BASE YEAR LOS



Transit

The Des Moines Area Regional Transit Authority (DART) provides public transportation to Polk County and adjoining member communities. DART is an independent authority composed of 20 local governments. The agency owns 247 active vehicles. DART provides the following services:

- Local Bus - This is the majority of DART's service, with 10 local routes.
- Express Bus - There are nine express routes serving the morning and afternoon peak hours.
- Shuttle - DART runs two free downtown shuttles plus one university shuttle.
- On-Call: Passengers who do not live in a fixed-route service area can call for a pick-up at their home.

Fares are \$1.75 for adult one-way local trips and \$2 for express routes. Transfers between local routes are free. Transfers from local service to on-call service cost \$1.75. In the downtown loop zone, fares are 75 cents. This zone is bounded by I-235 to the north, W. 15th Street to the west, Mulberry Avenue to the south and E. 14th Street to the east. Flex route fares cost \$1.75 for adult and flex zone fares are \$3.50. On-call zone trips cost \$3.50. A monthly pass valid on all services costs \$58.

DART Central Station is the heart of the transit network in Greater Des Moines. Located in downtown Des Moines at 620 Cherry Street, it is the primary transfer location between routes and includes the Customer Service Department and Administrative Offices. The bus system has 3,500 bus stops.

Local Service

DART runs sixteen local routes that provide service in Altoona, Des Moines, Pleasant Hill, West Des Moines, and Windsor Heights. DART's local routes operate on Mondays through Fridays with some limited service on evenings and weekends. Figure B8 summarizes existing local bus service.

Express Service

DART runs eight express routes that provide service in Altoona, Ankeny, Clive, Des Moines, Johnston, Urbandale, West Des Moines and Windsor Heights. Routes operate Monday through Friday during the morning and evening rush hours, picking up passengers at limited stops and providing direct, non-stop service to and from downtown Des Moines. Figure B10 summarizes existing express bus service.

FIGURE B8: DART LOCAL ROUTES

ROUTE #	ROUTE NAME	DESCRIPTION
1	Fairgrounds	DART Central Station, Downtown, Iowa State Fairgrounds, Four Mile Community Center, Hubbell Ave and Pleasant Hill
3	University Avenue	DART Central Station, Downtown, Children & Family Services, Department of Human Services, Drake University, Windsor Heights Walmart and Valley West Mall
4	East 14th Street	DART Central Station, Downtown, State Capitol, Grandview University, Goodwill Industries, Polk County Jail and Park Fair Mall
5	Franklin Avenue	DART Central Station, Downtown, Drake University, Mercy-Franklin Medical Center and Franklin Public Library
6	Indianola Avenue	DART Central Station, SE 5th Street, SE 14th Street Walmart and Southridge Mall
7	SW 9th Street	DART Central Station, South Side Public Library, Blank Park Zoo, Fort Des Moines and Southridge Mall
8	Fleur Drive	DART Central Station, AIB College of Business, Wakonda Shopping Center and Airport South Park & Ride
11	Ingersoll Ave/Valley Junction	DART Central Station, Downtown, Ingersoll Ave and Valley Junction
13	SE Park Avenue	SE Park Ave, Forest Glen Apartments, SE 22nd Street, Evergreen Avenue, Southgate Shopping Center and service to Local Route 6
14	Beaver Avenue	DART Central Station, Downtown, Methodist Medical Center, Westchester Evangelical Free Church Park & Ride and Merle Hay Mall
15	6th Avenue	DART Central Station, Downtown, Wells Fargo Events Center, Mercy Medical Center and Park Fair Mall
16	Douglas Avenue	DART Central Station, Downtown, Broadlawns Medical Center, IOWA Department of Transportation and Merle Hay Mall
17	Hubbell Avenue/Altoona	DART Central Station, Downtown, East Side Public Library, Goodwill Industries and Altoona Walmart Park & Ride
51	Merle Hay Crosstown	DART Central Station, Downtown, Ingersoll Avenue, Merle Hay Road and Merle Hay Mall
52	Valley West/Jordan Creek Crosstown	DART Central Station, Downtown, Valley West Mall, Athene, Wells Fargo and Jordan Creek Town Center
60	University/Ingersoll	DART Central Station, Downtown, Drake University, Department of Human Services, Children & Family Services, Mercy Medical Center, Wells Fargo Event Center

FIGURE B9: DART LOCAL ROUTE MAP

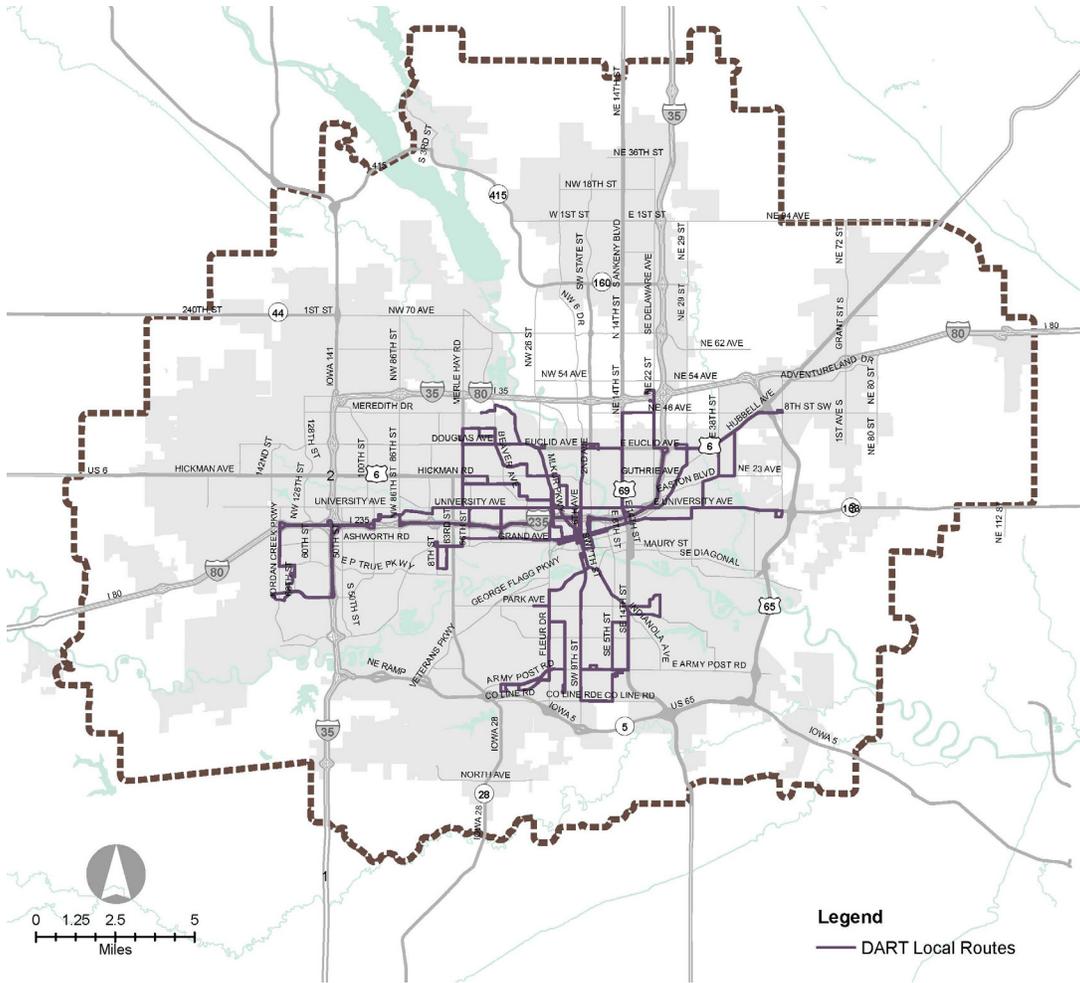
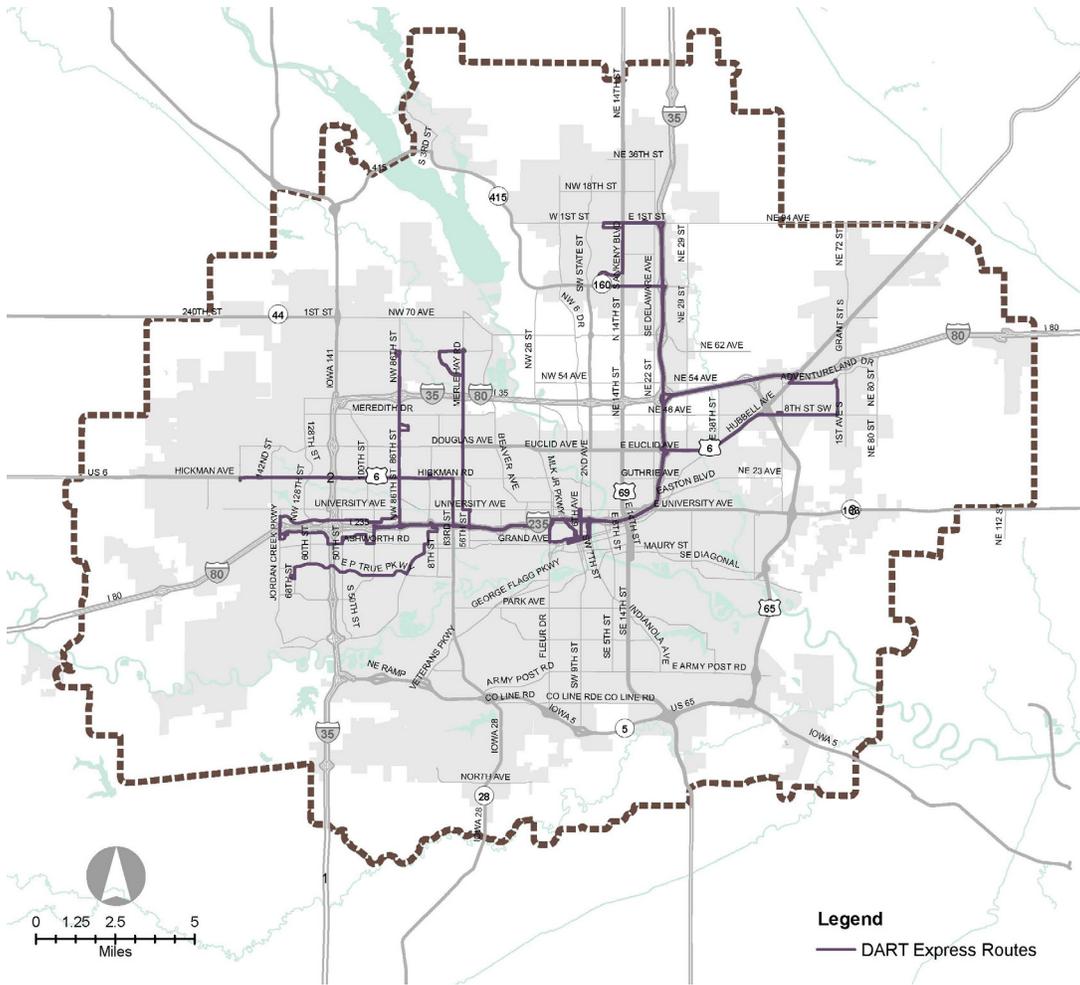


FIGURE B10: DART EXPRESS ROUTES

ROUTE #	ROUTE NAME	DESCRIPTION
91	Merle Hay	Operates between Johnston City Hall Park & Ride and downtown Des Moines
92	Hickman	Operates between 156th Street in Clive and downtown Des Moines
93	NW 86th Street	Operates between John Deere Financial in Johnston and downtown Des Moines
94	Westown	Operates between Wells Fargo in West Des Moines and downtown Des Moines
95	Vista	Operates between Jordan Creek Parkway in West Des Moines and downtown Des Moines
96	EP True	Operates between Jordan Creek Town Center in West Des Moines and downtown Des Moines
98	Ankeny	Operates between DMACC campus in Ankeny and downtown Des Moines
99	Altoona	Operates between Altoona and downtown Des Moines

FIGURE B11: DART EXPRESS ROUTE MAP



Flex Service

DART runs three flex routes that provide service in Clive, Urbandale, West Des Moines and Windsor Heights. Routes operate as a fixed-route that flexes between scheduled stops, deviating up to one mile from the fixed route. This service is demand responsive requiring customers to schedule trips. Figure B12 summarizes existing flex service.

FIGURE B12: DART FLEX ROUTES

ROUTE #	ROUTE NAME	DESCRIPTION
72	West Des Moines/Clive	Jordan Creek Town Center area, University Avenue medical corridor, Valley West Mall and the Valley Junction area
73	Urbandale/Windsor Heights	Gloria Dei Lutheran Church Park & Ride and Ice Arena Park & Ride
74	NW Urbandale	Valley West Mall, Mercer/Marsh and the business parks in northwest Urbandale

On Call Service

DART runs five on call zones that provide service in Alleman, Ankeny, Bondurant, Carlisle, Easter Lake, Granger, Grimes, Mitchellville, northwest Johnston and Polk City. This service is demand responsive requiring customers to schedule trips. The service picks up passengers at their doors and takes them to destinations within specific zones. Figure B13 summarizes existing on call service.

FIGURE B13: DART ON CALL SERVICE

SERVICE	DESCRIPTION
Alleman/Bondurant/Mitchellville	Alleman, Altoona, Ankeny, Bondurant and Mitchellville
Ankeny	City of Ankeny
Carlisle/Easter Lake	Altoona, Carlisle, Des Moines (Southridge Mall and Wal-Mart) and Easter Lake
Granger/Grimes/Polk City	Ankeny, Granger, Grimes, Polk City and West Des Moines (Valley West Mall)
Grimes/Johnston	Grimes and northwest Johnston area, including service the Wal-Mart Park & Ride

Shuttle Routes

DART runs two shuttle route that provide service in downtown Des Moines. Figure B14 summarizes existing shuttle routes.

FIGURE B14: DART SHUTTLE ROUTES

ROUTE #	ROUTE NAME	DESCRIPTION
40	The LINK	Center Street Park & Ride and destinations along 7th and 8th Streets in downtown Des Moines.
42	D-Line Downtown	East Village and the Western Gateway along Grand Avenue and Locust Street.

Ridership

Figure B15 breaks down total Fiscal Year (FY) 2013 ridership. Route 51 shows zero ridership due to the fact that the route did not come online until FY 2014.

Figure B16 shows annual ridership for express bus routes. Most population pockets are served by an express bus route, as shown in Figure B11. Areas without express service include lower density areas throughout the region, though the higher density areas are served by local bus service.

The LINK is a free shuttle circulating downtown on 7th and 8th Streets and serving the Center Street Park & Ride. The D-Line is a free downtown shuttle running every 10 minutes in a loop along Grand Avenue and Locust Streets connecting the Western Gateway, Walnut Street area, and East Village. The shuttle is funded by DART and the Downtown Community Alliance. Figure B17 shows ridership for DART's shuttle service in FY 2013.

FIGURE B15: DART LOCAL ROUTE RIDERSHIP FISCAL YEAR 2013

ROUTE #	ROUTE NAME	RIDERSHIP
1	Fairgrounds	420,165
3	University Avenue	599,517
4	East 14th Street	254,778
5	Franklin Avenue	107,377
6	Indianola Avenue	396,989
7	SW 9th Street	445,179
8	Fleur Drive	102,840
11	Ingersoll Ave/Valley Junction	109,762
13	SE Park Avenue	67,006
14	Beaver Avenue	136,081
15	6th Avenue	165,998
16	Douglas Avenue	246,284
17	Hubbell Avenue/Altoona	114,240
51	Merle Hay Crosstown	0
52	Valley West/Jordan Creek Crosstown	68,766
60	University/Ingersoll	160,604
Total Ridership		3,395,586

FIGURE B16: DART EXPRESS ROUTE RIDERSHIP FISCAL YEAR 2013

ROUTE #	ROUTE NAME	RIDERSHIP
91	Merle Hay	11,686
92	Hickman	37,453
93	NW 86th Street	43,120
94	Westown	16,660
95	Vista	24,736
96	EP True	33,691
98	Ankeny	97,865
99	Altoona	23,110
Total Ridership		288,321

FIGURE B17: DART SHUTTLE RIDERSHIP FISCAL YEAR 2013

ROUTE #	ROUTE NAME	RIDERSHIP
40	LINK Shuttle	12,755
42	D-Line Downtown	208,332
Total Ridership		221,087

Bicycle

The bikeway network in the MPO planning area is comprised of shared-used trails and various types of on-street bicycle facilities. Existing on-street bicycle facilities in the MPO include bicycle lanes, shared lane markings, bicycle boulevards, paved shoulders and bicycle routes. Figure B18 provides a summary of bicycle facilities in the MPA.

FIGURE B18: DES MOINES MPA BICYCLE ROUTE NETWORK SUMMARY

BICYCLE FACILITIES	MILES	PERCENT OF NETWORK
Trails (Shared-Use Paths)	398	94%
On-street Bicycle Facilities	27	6%
Total	425	

Bicycle lanes are a designated portion of the roadway for the preferential or exclusive use of bicyclists. Separated from vehicle travel lanes, bicycle lanes are delineated with striping and pavement markings. Bicycle lanes help define a designated space for bicyclists and are typically found on arterial and collectors streets where higher traffic volumes and vehicular speeds warrant greater separation. Figure B19 lists existing on-street bicycle facilities in the MPO.

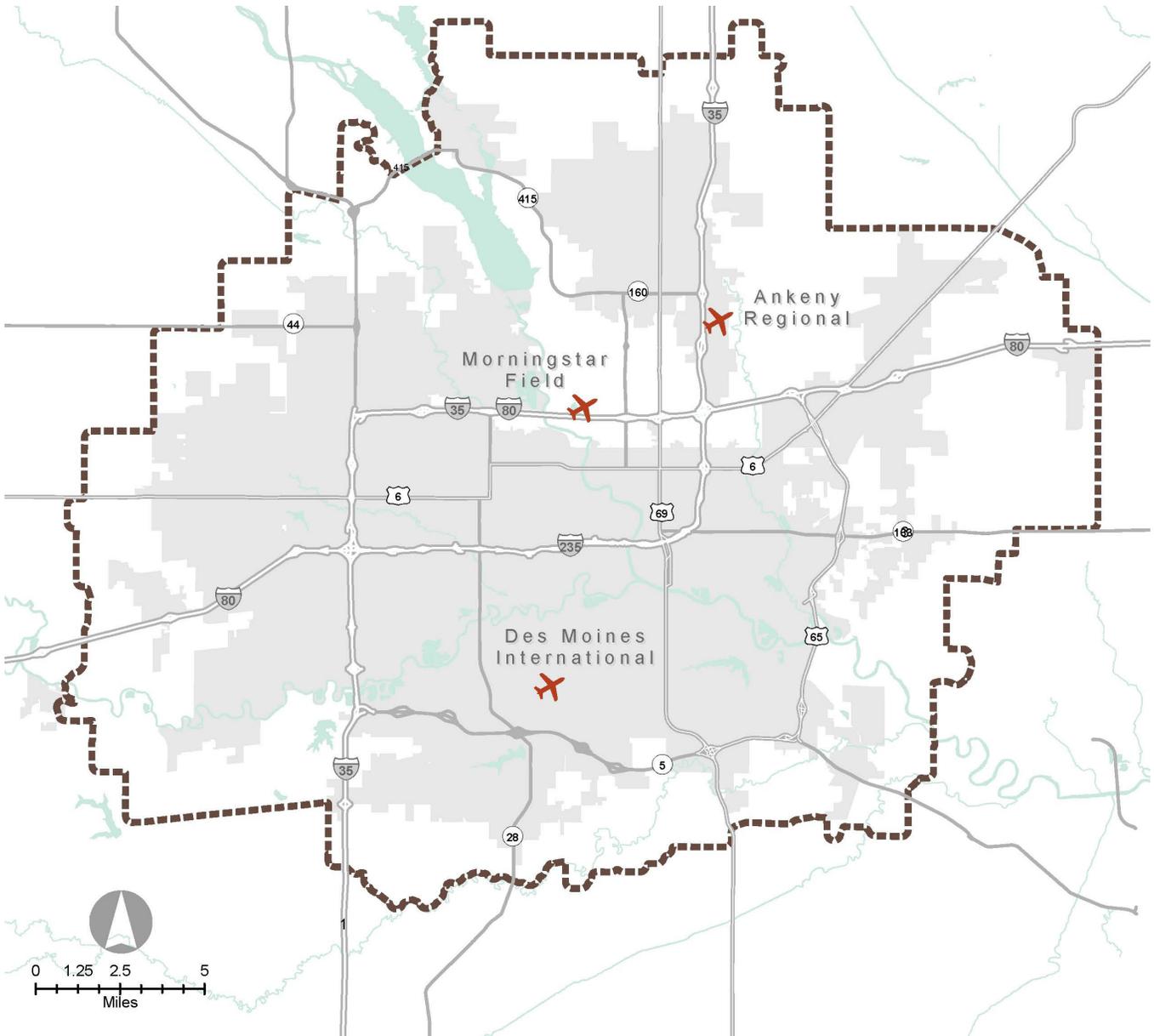
FIGURE B19: EXISTING ON-STREET BICYCLE FACILITIES IN THE MPO

STREET	JURISDICTION(S)	FACILITY TYPE(S)
133rd Street	Urbandale	Bicycle Boulevard
1st Avenue S	Altoona	Paved Shoulder
45th Street	Des Moines	Shared Lane Marking
5th Avenue	Des Moines	Shared Lane Marking/Bike Lane
7th Street	Des Moines	Bike Lane
Beaver Avenue	Des Moines	Bike Lane
Cottage Grove Avenue	Des Moines	Bike Lane
Crocker Street	Des Moines	Bike Lane
E 6th Street	Des Moines	Bike Lane
E Army Post Road	Des Moines	Paved Shoulder
Fuller Road	West Des Moines	Shared Lane Marking
Grand Avenue	Des Moines	Bike Lane
Indianola Avenue	Des Moines	Bike Lane
Locust Street	Des Moines	Shared Lane Marking
MLK Jr Parkway	Des Moines	Bike Lane
NE 56th St/34th Ave SW	Altoona/Pleasant Hill	Bike Lane
Scott Ave/1st St Bridge	Des Moines	Bike Lane
SW 6th Avenue	Des Moines	Bike Lane
Urbandale Avenue	Des Moines	Bike Lane
Vine Street	West Des Moines	Shared Lane Marking
Vista Dr/Prairie View Dr	West Des Moines	Shared Lane Marking

Aviation

The Des Moines region is served by three airports, including two public airports and one general private airfield. Figure B20 identifies the location of both public and private use airports in the region. The following section will focus on the two principal airports in the MPA – the Des Moines International Airport and the Ankeny Regional Airport. The Iowa DOT’s [Iowa Aviation System Plan 2010-2030](#) includes individual airport summaries for Iowa airports.

FIGURE B20: AIRPORTS IN THE MPA



Ankeny Regional Airport

The Ankeny Regional Airport (IKV) is considered an Enhanced Service facility that provides general aviation needs for the Des Moines region as a business airport and as a reliever to the Des Moines International Airport. The IKV is owned and operated by the Polk County Aviation Authority and accounts for personal and business travel, as well as just-in-time shipping, law enforcement, agricultural, and medical transport.¹

Facilities

The Ankeny Regional Airport has two concrete runways – a 5,500 foot runway and a 3,855 foot runway. Both runways are accessible under less-than-visual meteorological conditions, using Instrument Flight Rules (IFR). The IKV's facilities include a terminal building with a passenger lounge and meeting rooms. The fixed base operator (FBO) is located in the terminal building.

Services

The FBO provides charter service, flight department management, aircraft sales, aircraft rental, aircraft storage and maintenance, aircraft fueling, and pilot training.

Des Moines International Airport

The City of Des Moines owns and operates Des Moines International Airport (DSM). The airport is governed by a five member Airport Authority Board, composed of representatives appointed by the Des Moines Mayor and approved by the Des Moines City Council.

DSM serves as the major air passenger and airfreight service center for central Iowa. Figure B21 provides a listing of non-stop commercial flight destinations. In addition, DSM serves as a base for the Iowa Air National Guard.

Facilities

DSM supports two concrete runways that are accessible under less-than-visual meteorological conditions, using Instrument Flight Rules (IFR). Terminal facilities include a passenger terminal complex, U.S. Customs and Immigration facility, air cargo facilities, general aviation facilities, military facilities, an aircraft rescue and fire fighting facility, an air traffic control tower, and maintenance facilities.

Services

DSM provides general aviation and commercial services. General aviation services include hangar rental, charter, aircraft rental, fuel, power and airframe repair, aircraft sales, avionics sales and repair, and pilot instruction.

¹ http://www.iowadot.gov/aviation/data_driven/publications/System_plan_reports/SPRIKV.pdf

FIGURE B21: NON-STOP COMMERCIAL FLIGHT DESTINATIONS

CARRIER	NON-STOP DESTINATION
Delta Airlines	Atlanta
US Airways	Charlotte
US Airways	Washington D.C.
Frontier Airlines United Airlines	Denver
American Airlines	Dallas
Delta Airlines	Detroit
United Airlines	Newark
United Airlines	Houston
Delta Airlines	New York City
Allegiant Air Southwest Airlines	Las Vegas
Allegiant Air	Los Angeles
Southwest Airlines	Chicago (Midway)
Delta Airlines	Minneapolis
American Airlines United Airlines	Chicago (O'Hare)
Allegiant Air	Punta Gorda
US Airways	Phoenix
Allegiant Air	Tampa Bay - St. Petersburg
Allegiant Air	Orlando

Source: Des Moines Airport Authority

Passenger Data

Since 2003, the Des Moines International Airport has experience a 2 percent annual growth rate in total passenger. Table X shows enplaned, deplaned, and total passenger boarding's for the previous 10 years.

FIGURE B22: PASSENGER BOARDINGS, 2003-2013

YEAR	ENPLANED	DEPLANED	TOTAL
2003	911,063	910,852	1,821,915
2004	997,655	992,512	1,990,167
2005	951,604	951,969	1,903,573
2006	978,907	980,486	1,959,393
2007	992,059	990,574	1,982,633
2008	952,152	944,237	1,896,389
2009	875,625	876,844	1,752,469
2010	914,587	916,475	1,831,062
2011	959,997	952,999	1,912,996
2012	1,038,484	1,041,678	2,080,162
2013	1,101,524	1,099,864	2,201,388
Annual Growth Rate			2%

Railroad System

Four railroad companies operate within the MPA. Three of these railroads are Class I railroads and the other is a Class II railroad. The U.S. DOT’s Surface Transportation Board classifies railway companies based on their operating revenue. Class I railroads possess yearly operating revenues in excess of \$250 million, while Class II railroads retain operating revenues between \$20 million and \$250 million.¹

FIGURE B23: RAILROADS SERVING THE MPA

CLASS	RAILROAD COMPANY
I	Burlington Northern Santa Fe (BNSF)
I	Norfolk Southern (NS)
I	Union Pacific (UP)
II	Iowa Interstate (IAIS)

Passenger Rail

Currently, the MPA has no passenger rail services. The National Railroad Passenger Corporation’s (Amtrak) nearest station is located in Osceola, approximately 50 miles south of the MPA.

Freight Network Facilities

The freight network expands beyond the traditional freight movement by trucks, air, and rail.

Port of Entry

The United States Customs and Border Protection (CBP) lists DSM as a Port of Entry, and provides the following definition of a Port of Entry:

“Any designated place at which a CBP officer is authorized to accept entries of merchandise to collect duties, and to enforce the various provisions of the customs and navigation laws.”²

DSM is the only Port of Entry located in Iowa. This fact means that DSM is the only location in Iowa for international goods and international passengers to enter the state.

Foreign Trade Zone

The United States Department of Commerce’s International Trade Administration provides the following definition of a Foreign Trade Zone:

“Foreign Trade Zones (FTZs) were created in the United States to provide special customs procedures to U.S. plants engaged in international trade-related activities. Duty-free treatment is accorded items that are processed in FTZs and then reexported, and duty payment is deferred on items until they are brought out of the FTZ for sale in the U.S. market. This helps to offset customs advantages available to overseas producers who compete with domestic industry.”³

The MPA contains one FTZ: Foreign Trade Zone No. 107 (FTZ 107). The Foreign Trade Zones Board granted FTZ 107 to the Iowa Foreign Trade Zone Corporation, an Iowa non-profit corporation affiliated with the Greater Des Moines Chamber of Commerce, Des Moines, Iowa, in April 1980. Centennial Warehouse Corporation operates FTZ 107 at its warehouse at 10400 Hickman Road in Clive.

1 www.stb.dot.gov/fd35087files/00.9_Glossary_Dec08.pdf
2 (19 CFR 101.1).
3 <http://ia.ita.doc.gov/ftzpage/tic.html>

Intermodal Facilities

Intermodal facilities transfer goods/freight that is moved between two or more transportation modes. The Des Moines Area MPO's 2006 Goods Movement in the Des Moines Metropolitan Area report identified the following intermodal facilities in the MPA: ⁴

- Des Moines International Airport – 5800 Fleur Drive, Des Moines, IA;
- Ankeny Regional Airport – 3700 SE Convenience Boulevard, Ankeny, IA;
- Williams Pipeline Company Terminal – 2503 Southeast 43rd Street, Des Moines, IA; and,
- Amoco Oil Company Terminal – 1501 Northwest 86th Street, Clive, IA.

Air/Truck Facilities

Two air/truck intermodal facilities exist within the MPA, the Ankeny Regional Airport and the Des Moines International Airport. Companies use the airports as intermodal facilities, transferring cargo from truck to airplane for continued shipment to other locations outside central Iowa.

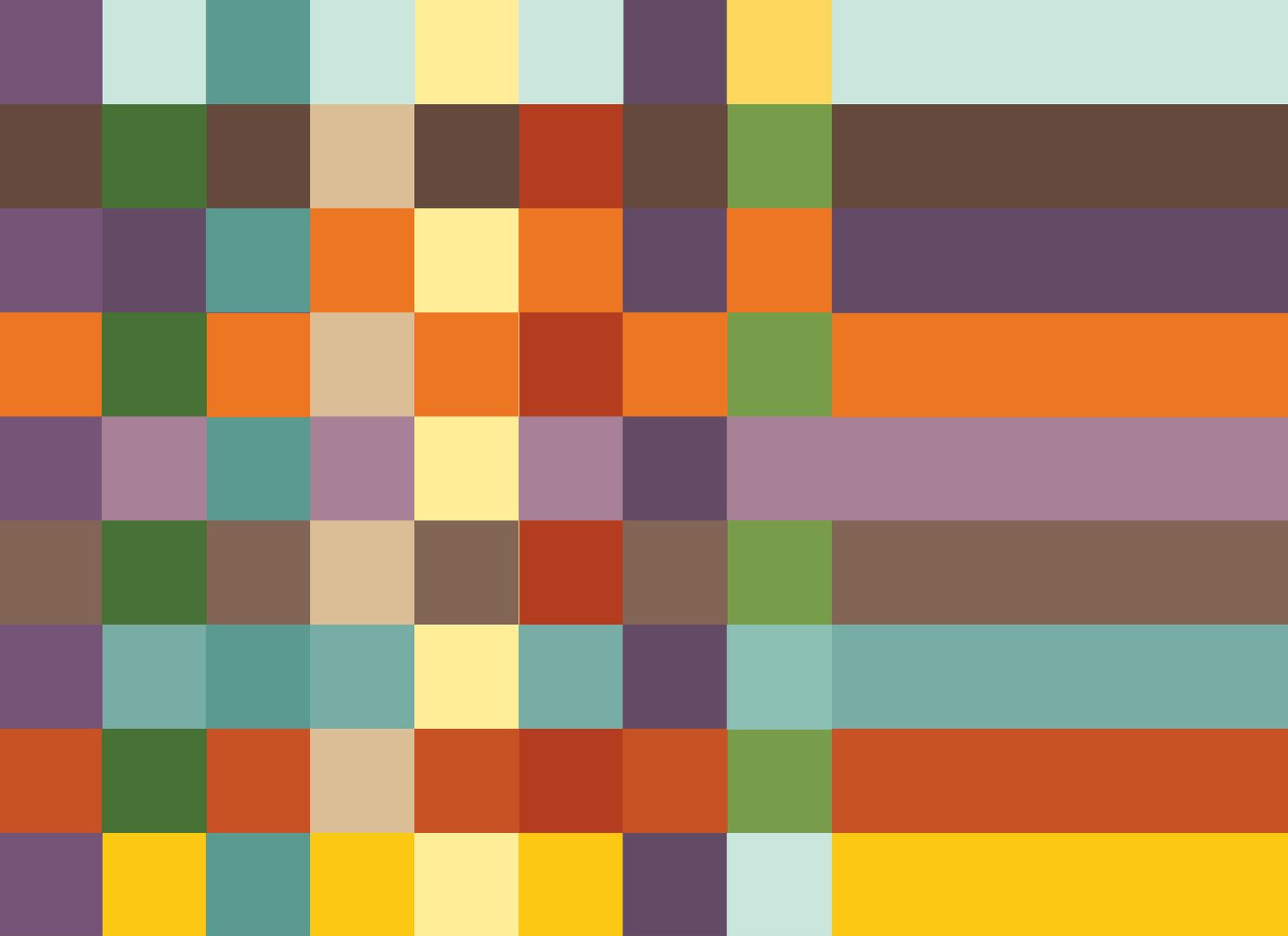
Pipeline/Railroad/Truck Facilities

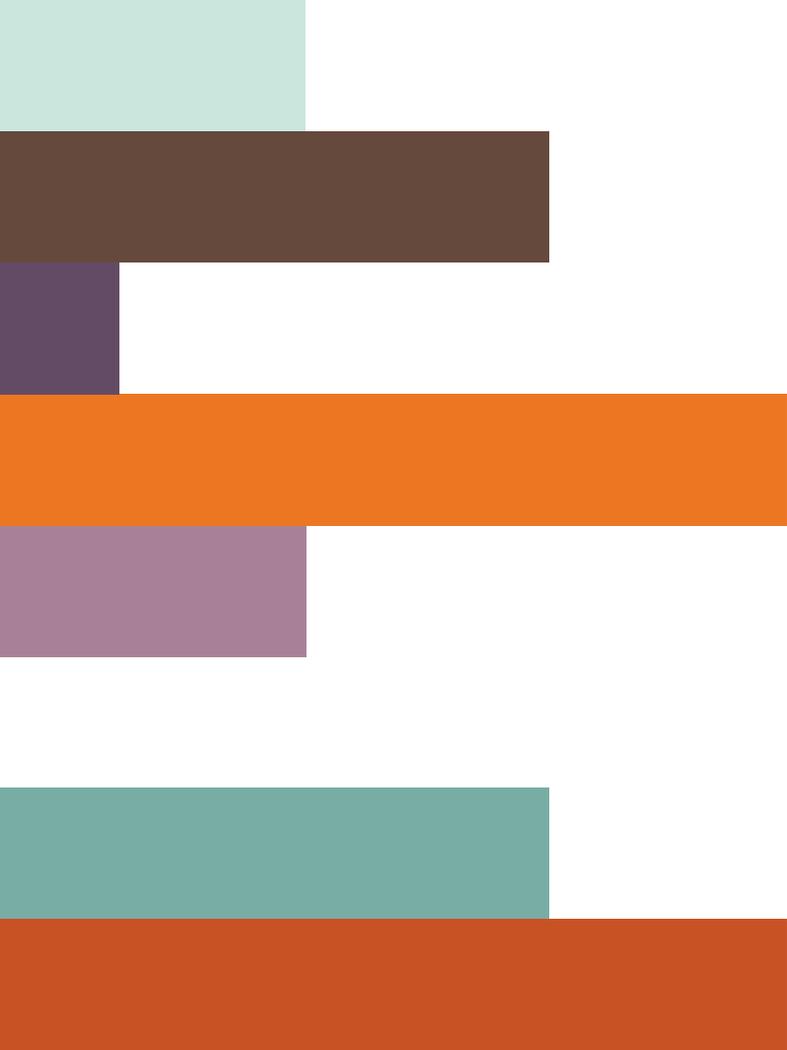
Two pipeline/railroad/truck intermodal facilities are located in the MPA. The Amoco Oil Company Terminal is located on 86th Street in Clive. The Williams Pipeline Company Terminal is located on SE 43rd Street in Des Moines. Both facilities allow petroleum products to transfer from pipeline to railcar or truck, allowing for distribution to other parts of the MPA and across Iowa.

Railroad/Truck Facilities

No railroad/truck intermodal facilities currently are located within central Iowa. The Newton Rail/Truck Intermodal Facility, located near Newton and the closest facility to the MPA, ceased operations in May 2009.

⁴ According to the National Center for Intermodal Transportation's definition of intermodal transportation, grain elevators also qualify as intermodal facilities.





APPENDIX C:
DEMOGRAPHICS +
2050 GROWTH
SCENARIO

DEMOGRAPHICS AND 2050 GROWTH SCENARIO

This appendix summarizes current socioeconomic conditions in the Greater Des Moines area and provides a forecast of future socioeconomic conditions, also known as a growth scenario.

Current Socioeconomic Conditions

The Des Moines Area MPO collects and reviews a variety of socioeconomic datasets in order to analyze the MPA's transportation needs. By collecting and analyzing socioeconomic data, the Des Moines Area MPO identifies where residents live, work, shop, and travel.

General Demographic Characteristics

Figure C1 identifies growth trends in the Des Moines-West Des Moines MSA counties from 1990 to 2013. Polk County continues to possess the largest population base in the Des Moines-West Des Moines MSA. Dallas County has experienced the largest percentage of population growth from 1990 to 2013. Additionally, as noted in Figure C2, the MPA accounts for approximately 16 percent of the State of Iowa's 2010 population. Figure C3 provides a demographic profile of Dallas, Polk, and Warren Counties from the 2010 Census.

FIGURE C1: HISTORICAL AND ESTIMATED POPULATION, 1990-2013

	1990	2000	2010	2013 ESTIMATE	1990 – 2013 GROWTH
State of Iowa	2,776,755	2,926,324	3,046,355	3,090,416	313,661
Des Moines - West Des Moines MSA	416,346	481,394	569,633	599,789	183,443
Dallas Co.	29,755	40,750	66,135	74,641	44,886
Guthrie Co.	10,935	11,353	10,954	10,687	-248
Madison Co.	12,483	14,019	15,679	15,448	2,965
Polk Co.	327,140	374,601	430,640	451,677	124,537

Source: US Census Bureau

FIGURE C2 DES MOINES AREA MPO MPA POPULATION, 2010

	2010	PERCENT OF STATE
State of Iowa	3,046,355	100%
Des Moines-West Des Moines MSA	569,633	19%
Des Moines Area MPO MPA	479,866	16%
Dallas Co. Portion of MPA	38,947	1%
Guthrie Co. Portion of MPA	0	0%
Madison Co. Portion of MPA	193	0.01%
Polk Co. Portion of MPA	423,798	14%
Warren Co. Portion of MPA	16,928	1%

Source: US Census Bureau

FIGURE C3 GENERAL DEMOGRAPHIC CHARACTERISTICS OF DALLAS, POLK, AND WARREN COUNTIES, 2010

	DALLAS COUNTY	POLK COUNTY	WARREN COUNTY
Total Population	66,135	430,640	46,225
Male	32,349	211,171	22,507
Female	33,786	219,469	23,718
Age			
5 - 15 Years	10,925	60,308	6,962
16 - 64 Years	42,962	290,971	30,130
65 Years and Over	6,476	46,545	6,159
Race			
White	61,884	374,062	45,428
Black or African American	1,245	30,929	426
American Indian and Alaska Native	351	3,474	264
Asian	1,958	17,817	392
Native Hawaiian and Other Pacific Islander	82	601	40
Other	1,685	14,873	275
Two or More Races	726	8,094	456

Source: US Census Bureau

Housing Characteristics

Figure C4 provides a housing profile of Dallas, Polk, and Warren Counties. Nearly 20 percent (45,067) of all housing units were built after 2000 and the region has a 94 percent occupancy rate. Approximately five percent of the three counties of the greater Des Moines metropolitan area's occupied housing units (households) do not have access to a vehicle, and 19 percent of the households have access to more than three vehicles.

FIGURE C4: SELECTED HOUSING CHARACTERISTICS FOR DALLAS, POLK, AND WARREN COUNTIES

	DALLAS COUNTY	MARGIN OF ERROR	POLK COUNTY	MARGIN OF ERROR	WARREN COUNTY	MARGIN OF ERROR
Housing Occupancy						
Total Housing Units	27,182	53	183,029	257	18,385	97
Occupied Housing Units	25,561	312	171,227	952	17,265	254
Vacant Housing Units	1,621	313	11,802	889	1,120	243
Homeowner Vacancy Rate	1.8	0.7	1.9	0.3	0.7	0.5
Rental Vacancy Rate	5.1	2.2	5	0.8	5	2.6
Year Built						
Before 1959	6,055	655	63,604	2,270	4,686	522
1960 - 2000	10,366	1,184	88,275	3,527	10,543	1,067
After 2000	10,761	707	31,150	1,270	3,156	339
Vehicles Available						
No Vehicles Available	665	152	10,501	543	519	116
1 Vehicle Available	6,805	460	55,401	1,297	4,111	257
2 Vehicles Available	12,318	530	72,556	1,437	6,980	340
3 or More Vehicles Available	5,773	354	32,769	994	5,655	301
Value						
Median Household Income	\$182,700	\$4,969	\$153,600	\$1,214	\$154,600	\$3,810

Source: US Census Bureau American Community Survey, 2008-2012 5-year Estimates

Economic Characteristics

Figure C5 provides an economic profile of Dallas, Polk, and Warren Counties. The three counties of the greater Des Moines metropolitan area, Dallas, Polk, and Warren Counties, employ approximately 75 percent of the persons aged 16 years and over. Of the workers aged 16 years and over, 76 percent commute to work in a single-occupant car, truck, or van.

FIGURE C5: ECONOMIC CHARACTERISTICS FOR DALLAS, POLK, AND WARREN COUNTIES

	DALLAS COUNTY	MARGIN OF ERROR	POLK COUNTY	MARGIN OF ERROR	WARREN COUNTY	MARGIN OF ERROR
Employment Status						
Population 16 Years and Over	49,514	181	332,916	450	35,600	149
In Labor Force	37,140	666	245,184	1,487	26,111	383
Civilian Labor Force	37,040	665	244,670	1,506	26,087	383
Employed	35,749	678	230,366	1,599	24,732	410
Unemployed	1,291	286	14,304	804	1,355	191
Armed Forces	100	56	514	189	24	19
Not in Labor Force	12,374	665	87,732	1,376	9,489	335
Commuting to Work						
Workers 16 Years and Over	35,207	693	226,602	1,509	24,234	417
Car, Truck, or Van -- Drove Alone	30,033	740	184,876	1,931	19,750	517
Car, Truck, or Van -- Carpooled	2,830	378	23,455	1,274	2,271	325
Public Transportation (Excluding Taxicab)	100	63	3,484	392	112	78
Walked	282	83	3,867	495	542	140
Other Means	305	164	2,279	315	146	71
Worked at Home	1,657	274	8,641	618	1,413	220
Mean Travel Time to Work (Minutes)	20.6	0.6	18.7	0.2	25.3	0.9

FIGURE C5: ECONOMIC CHARACTERISTICS FOR DALLAS, POLK, AND WARREN COUNTIES (CONTINUED)

	DALLAS COUNTY	MARGIN OF ERROR	POLK COUNTY	MARGIN OF ERROR	WARREN COUNTY	MARGIN OF ERROR
Industry						
Civilian Employed Population 16 Years and Over	35,749	678	230,366	1,599	24,732	410
Agriculture, Forestry, Fishing and Hunting, and Mining	766	150	2,723	442	288	82
Construction	2,287	343	12,744	945	2,091	258
Manufacturing	2,969	341	18,061	868	1,437	169
Wholesale Trade	1,246	235	7,346	549	736	148
Retail Trade	3,794	425	25,435	1,149	2,990	300
Transportation and Warehousing, and Utilities	1,089	219	9,645	624	1,178	198
Information	957	241	5,937	592	492	106
Finance and Insurance, and Real Estate and Rental and Leasing	8,139	572	39,232	1,420	3,484	358
Professional, Scientific, and Management, and Administrative and Waste Management Services	3,256	351	22,420	1,174	2,124	276
Educational Services, and Health Care and Social Assistance	7,109	532	47,386	1,451	6,182	398
Arts, Entertainment, and Recreation, and Accommodation, and Food Services	1,618	308	19,705	1,111	1,465	220
Other Services, Except Public Administration	1,273	239	9,779	778	1,061	173
Public Administration	1,246	260	9,953	692	1,204	157
Income						
Median Household Income (Dollars)	71,878	2,326	58,096	1,019	62,778	2,256
Mean Household Income (Dollars)	91,057	2,744	74,256	1,096	76,578	2,769

Source: US Census Bureau American Community Survey, 2008-2012 5-year Estimates

2050 Growth Scenario

Summary

Introduction and Background

A long-range transportation plan (LRTP) must project transportation demand for persons and goods over the period of the plan. To do this, the MPO must forecast population and employment growth out to the plan's horizon year and also identify where this growth will occur. To accomplish this, the MPO undertakes a growth scenario process that identifies a number of alternatives for how this growth may occur.

There are two main components within the growth scenario process to which alternatives may be applied: the overall growth rate and the location of growth. The MPO's overall rate of growth historically been assumed to be a continuation of past trends or, more recently, has been based off of the Regional Economic Models, Inc. (REMI) population and employment forecasts. REMI forecasts are provided by the Iowa Department of Transportation. The location of growth has had some degree of alternatives considered, most recently in the Horizon Year 2030 Long-Range Transportation. The Horizon Year 2035 Metropolitan Transportation Plan (MTP) did not explicitly consider alternative growth scenarios, although it did allocate the MPO's overall growth to the subarea level at the same proportions used for the 2030 plan's final scenario.

Growth Scenario in The Tomorrow Plan

As noted in the introduction to *Mobilizing Tomorrow*, the region developed The Tomorrow Plan between 2010 and 2013. Throughout The Tomorrow Plan development, both components of a 2050 growth scenario were developed to some extent. For the 2035 MTP, the MPO evaluated the REMI forecast methodology for accuracy and ultimately determined it to be the source for the MPO's population and employment forecasts moving forward. The Tomorrow Plan continued with this precedent and used REMI when updating population and employment forecasts out to the year 2050.

The Tomorrow Plan also undertook a scenario planning exercise that looked at four possible scenarios for growth in the metropolitan area through the year 2050. Each of the four scenarios used the same population and employment control totals for both the MPO boundary and each of the seven subareas within the MPO boundary. The purpose of these four scenarios was not to predict with certainty how the region will or should develop at a local level, but rather to understand how the region could develop under different circumstances and policies and what the trade-offs and impacts of each scenario might be. The scenarios were developed using a geographic information system (GIS)-based growth raster model and were aggregated to the Traffic Analysis Zone (TAZ) level for use in the MPO's travel demand model. The four scenarios developed included:

- Scenario 1: Business As Usual (growth continues as allowed by existing zoning regulations)
- Scenario 2: Business As Usual – Small Lots (growth continues as allowed by existing zoning regulations but will develop at the highest possible densities allowed)
- Scenario 3: Future Land Use (growth will occur as identified in local community comprehensive plans)
- Scenario 4: Regional Systems (growth will be directed toward vacant properties, along transit routes, and at higher densities, while no growth occurs in ecologically sensitive areas)

Following the presentation of the four scenarios to The Tomorrow Plan steering committee, local community representatives, and the public, The Tomorrow Plan steering committee decided to move forward with crafting goals, strategies, and initiatives that provide a mix of Scenario 3 and Scenario 4. However, a detailed final growth allocation to geographies smaller than the seven subareas (such as TAZs) did not occur.

Development of a Final 2050 Growth Scenario

For purposes of travel demand modeling, the 2050 growth forecasts must be allocated to the TAZ level of geography. To be consistent with and to help implement The Tomorrow Plan, the MPO staff worked with the MPO's Planning Subcommittee to develop a final scenario that fell somewhere between The Tomorrow Plan's Scenario 3 and Scenario 4. In particular, the MPO Planning Subcommittee desired to have earlier years of the final scenario build off of investments already made by communities in support of their existing plans and to transition the

growth in later years to reflect growth as advocated in The Tomorrow Plan.

Steps to Develop the 2050 Growth Scenario

The following steps were undertaken to develop the final 2050 Growth Scenario.

1. Established base-year population and employment data for MPO, subareas, and TAZs.
2. Determined employment growth allocations out to 2050 for each subarea following methodology used in The Tomorrow Plan.
3. Determined population growth allocations out to 2050 for each subarea following methodology used in The Tomorrow Plan.
4. Divided subarea control totals by jurisdictions based on an average allocation from The Tomorrow Plan's Scenario 3 and 4.
5. Community representatives worked with MPO staff to assign their allocated growth using the Envision Tomorrow software.
6. Allocated growth aggregated to TAZs for use in the travel demand model

Detailed Information

The following section provides a more in-depth explanation of the process and methodology used to develop the final 2050 Growth Scenario.

Geography

The 2050 Growth Scenario includes multiple steps that involves the collection, aggregation, and/or forecasting of data at a variety of geographic levels. The following is an explanation of the geographic levels used throughout the growth scenario process.

- Four-county level: the MPO's Metropolitan Planning Area (MPA) resides in parts of Polk, Dallas, Warren, and Madison Counties, which are referred to throughout this document as the four-county level. REMI data is provided at the county level and, therefore, must be adjusted to provide Planning Area data.
- Metropolitan Planning Area (MPA): the MPA includes areas within Polk, Dallas, Warren, and Madison Counties that are expected to be urbanized by the year 2050.
- Subarea: the MPO's MPA boundary is divided into seven subareas. These subareas were established during The Tomorrow Plan's development based on interviews with real estate and community development/economic development communities, consideration of symbolic and physical boundaries, analysis of real estate supply data and development trends, and previous subareas used by the MPO.
- Traffic Analysis Zone: The MPA is divided into over 1,000 TAZ for use in travel demand modeling.
- Parcel-Based Geography: Base-year employment data and future year growth assignments were completed using parcel-based geography. These geographies were based upon land parcels. To limit the size of parcels, a five-acre grid was placed over the parcel map which resulted in the subdivision of some parcels.

Figures C6 and C7 illustrate the geographies from the above list.

FIGURE C6: FOUR-COUNTY AREA AND MPA GEOGRAPHIES

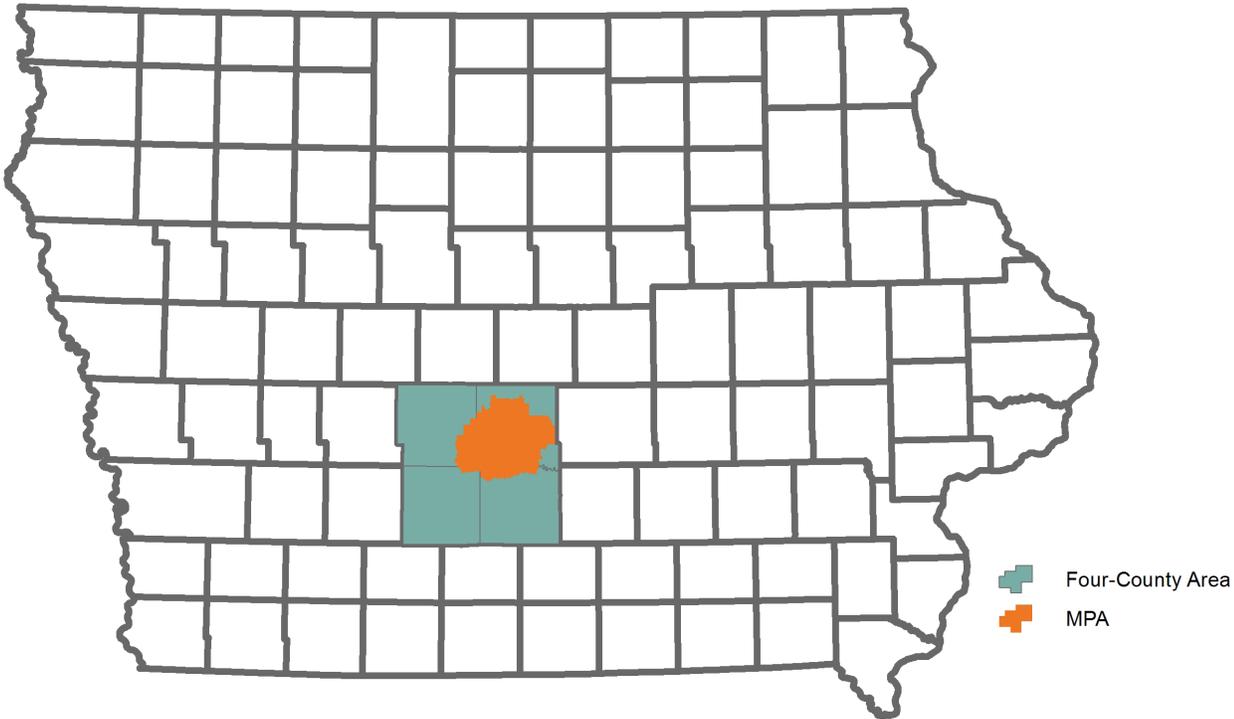
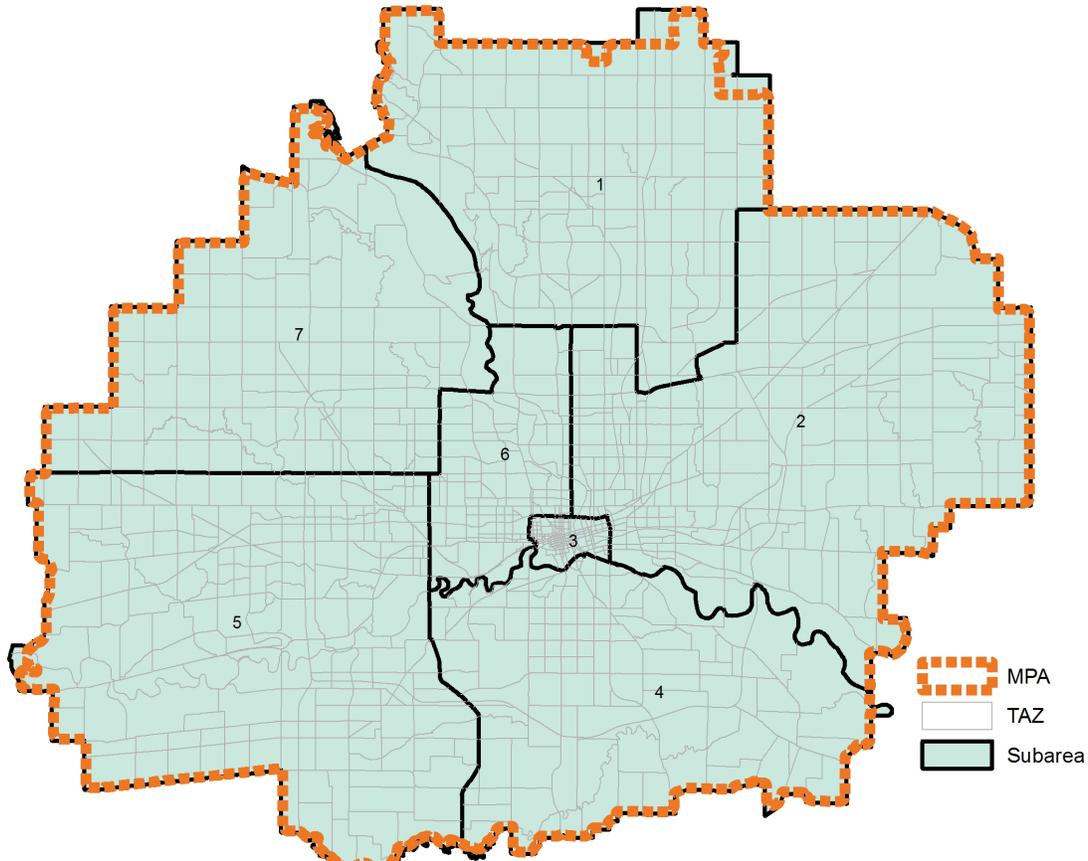


FIGURE C7: MPA, SUBAREA, AND TAZ GEOGRAPHIES



Step 1: Establish Base-Year Population and Employment Data

MPO staff collected data for population and employment that was current as of 2010, which serves at the base year. Population, housing unit, and household information was collected from the US Census Bureau’s 2010 Decennial Census. Census data at the block geographic level were aggregated to the TAZ level.

Employment was estimated following a parcel-based methodology. MPO staff collected GIS information for commercial and industrial use parcels within each county. Information collected included the parcel size, detailed occupancy, building area, height, and age of the building. The detailed occupancy information was used to categorize each parcel into one of ten categories, and a jobs per square foot ratio was applied to each building, as illustrated in Figure C8. Mixed use buildings were addressed as well by identifying parcels with a mix of uses and estimating the percentage of each building’s area attributed to each use. Employment for each parcel was calculated by taking the building area multiplied by the number of floors multiplied by the jobs/square foot ratio.

Finally, the estimated employment was indexed to the REMI control total for each subarea. This was accomplished by summarizing the estimated employment for each parcel, determining the percentage of the total employment each parcel represents, and then applying that percentage for each parcel to the REMI control total for the parcel’s respective subarea. This process changed employment on each parcel slightly yet results in the sum of all parcel employment equaling the REMI employment control total.

Step 2: Determine Subarea Employment Forecasts

MPO staff used the methodology prescribed in the report Existing Conditions Analysis and Baseline Projections for The Tomorrow Plan, prepared by Gruen Gruen + Associates in November 2011, as a template for the 2050 Growth Scenario. This methodology is based upon analysis of REMI forecasts by county, historical employment trends by sector from Iowa Workforce Development, and current employment allocation.

REMI employment forecasts by North American Industry Classification System (NAICS) industry sector for the four-county area were obtained. NAICS sectors were aggregated into twelve primary classifications. Farm employment was not considered. Growth rates for each five-year time increment for each classification were calculated, as shown in Figure C9. A key assumption made was that the same industry classification growth rate forecasted at the county level also would be observed at the MPA level.

A determination of each county’s base-year employment within the MPA was then determined using ratios calculated during the HY 2035 MTP planning process. Work-from-home employment also was calculated by subtracting 0.95% of total employment, which was the percent determined during development of the HY 2035 MTP. Figure C10 summarizes the MPA’s base-year employment.

The 2010 to 2015 growth rate for each industry was applied to the base year employment for each sector to develop a 2015 employment figure for each sector. This process was repeated for each five-year increment out to 2050. Figure C11 summarizes forecasted employment by decade.

The next step was to subdivide employment to the subarea geography. To do this, each industry sector’s current distribution among the eight subareas was determined. Because the parcel-based base-year employment in Step 1 did not consider industry sectors, the MPO had to determine the current distribution using Iowa Workforce Development data. Iowa Workforce Development provided the MPO with the percentage of each subarea’s total employment comprised of each industry sector.

FIGURE C8: BUILDING USE AND JOBS/SF RATIO

USE CATEGORY	JOBS/SQUARE FOOT RATIO
Education	969
Hospital	385
Hotel	3,000
Manufacturing	750
Office	250
Public Assembly	1,400
Religious Worship	2,000
Retail	500
Senior Care	1,000
Warehouse/Flex	1,250

Source: Des Moines Area MPO

FIGURE C9: FIVE-YEAR GROWTH RATES BY INDUSTRY CLASSIFICATION, FOUR-COUNTY AREA

INDUSTRY	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050
Natural Resources and Construction	6.28%	1.93%	1.90%	1.27%	0.69%	0.68%	0.52%	0.07%
Manufacturing	0.12%	-0.59%	0.07%	0.28%	0.29%	0.17%	-0.27%	-0.61%
Wholesale Trade	0.78%	-0.08%	0.31%	0.24%	0.24%	0.05%	-0.26%	-0.60%
Retail Trade	0.59%	-0.02%	0.55%	0.42%	0.61%	0.47%	0.49%	0.55%
Transportation and Utilities	1.85%	0.72%	1.10%	1.24%	1.38%	1.33%	1.11%	0.87%
Information	1.12%	1.26%	-0.29%	-0.63%	-0.58%	-0.76%	-1.05%	-1.34%
Financial Activities	0.80%	0.30%	0.44%	0.35%	0.39%	0.25%	-0.11%	-0.59%
Professional and Business Services	2.41%	1.16%	1.00%	1.05%	1.13%	1.04%	0.73%	0.29%
Educational and Health Services	3.00%	2.23%	1.54%	1.37%	1.39%	1.34%	1.29%	1.17%
Leisure and Hospitality	1.43%	0.34%	0.97%	0.99%	1.15%	1.13%	0.93%	0.51%
Other Services	1.74%	0.75%	0.75%	0.79%	0.99%	0.93%	0.76%	0.32%
Government	0.73%	1.11%	0.83%	0.78%	0.85%	0.81%	0.61%	0.29%

Source: REMI Policy Insight Mode, February 2011

FIGURE C10: BASE YEAR MPA EMPLOYMENT BY INDUSTRY (NON-FARM AND NON-WORK FROM HOME)

INDUSTRY	DALLAS COUNTY	MADISON COUNTY	POLK COUNTY	WARREN COUNTY	MPA TOTAL
Natural Resources and Construction	1,250	5	15,783	291	17,330
Manufacturing	1,182	3	14,060	148	15,394
Wholesale Trade	522	1	15,553	144	16,220
Retail Trade	3,111	7	30,979	544	34,639
Transportation and Utilities	676	1	9,874	64	10,615
Information	355	0	8,253	96	8,704
Financial Activities	4,321	3	43,448	162	47,934
Professional and Business Services	2,497	8	55,072	523	58,099
Educational and Health Services	1,825	6	41,440	727	43,998
Leisure and Hospitality	1,939	4	27,718	392	30,053
Other Services	1,272	4	15,948	262	17,487
Government	2,079	11	35,548	673	38,311
Total	21,028	53	313,676	4,026	338,784

Source: REMI Policy Insight Mode, February 2011

FIGURE C11: MPA EMPLOYMENT GROWTH, 2010-2050

INDUSTRY	2010	2020	2030	2040	2050	2010-2050 GROWTH
Natural Resources and Construction	17,330	25,855	30,258	32,399	33,353	16,023
Manufacturing	15,394	15,032	15,294	15,652	14,976	-418
Wholesale Trade	16,220	16,801	17,268	17,518	16,777	556
Retail Trade	34,639	35,626	37,389	39,443	41,531	6,891
Transportation and Utilities	10,615	12,054	13,540	15,491	17,094	6,479
Information	8,704	9,795	9,352	8,743	7,752	-952
Financial Activities	47,934	50,640	52,683	54,385	52,503	4,569
Professional and Business Services	58,099	69,315	76,753	85,506	89,945	31,846
Educational and Health Services	43,998	56,949	65,804	75,356	85,153	41,155
Leisure and Hospitality	30,053	32,813	36,179	40,515	43,525	13,472
Other Services	17,487	19,786	21,364	23,501	24,805	7,319
Government	38,311	41,969	45,480	49,408	51,681	13,371
Total	338,784	386,634	421,364	457,918	479,094	140,311

Source: REMI Policy Insight Mode, February 2011

FIGURE C12: BASE YEAR EMPLOYMENT DISTRIBUTION BY INDUSTRY SECTOR AND SUBAREA

INDUSTRY	SUBAREA							TOTAL
	1	2	3	4	5	6	7	
Natural Resources and Construction	7%	24%	7%	17%	19%	5%	21%	100%
Manufacturing	16%	39%	1%	8%	11%	11%	14%	100%
Wholesale Trade	13%	27%	5%	8%	12%	3%	32%	100%
Retail Trade	12%	15%	2%	9%	37%	8%	17%	100%
Transportation and Utilities	9%	43%	5%	12%	13%	5%	14%	100%
Information	1%	2%	36%	17%	26%	5%	13%	100%
Financial Activities	1%	1%	30%	4%	50%	1%	12%	100%
Professional and Business Services	9%	8%	16%	12%	32%	7%	16%	100%
Educational and Health Services	8%	15%	14%	6%	19%	24%	13%	100%
Leisure and Hospitality	9%	19%	11%	9%	28%	10%	14%	100%
Other Services	11%	18%	12%	8%	27%	12%	11%	100%
Government	8%	6%	58%	5%	8%	4%	11%	100%
Total	8%	15%	16%	9%	27%	10%	15%	100%

Source: Iowa Workforce Development

The final step to determine employment distribution by subarea was to subdivide the MPA employment forecasts to the subarea level. To do this, an assumption was made that the base year distribution of each industry sector would continue into the future. For example, Subarea 1 would continue to have 16 percent of all manufacturing jobs in future years as it does in the base year. Therefore, for each subarea, each industry sector's future year employment at the MPA level was multiplied by each industry sector's current distribution percentage and summarized to arrive at a total for the subarea. A calculation for Subarea 1 for the year 2020 is provided as an example in Figure C13. Applying this example to all subareas results in employment totals for each subarea, as shown in Figure C14.

FIGURE C13: SUBAREA 1 FUTURE YEAR EMPLOYMENT TOTAL CALCULATION EXAMPLE

INDUSTRY	2020 MPA TOTAL (A)	SUBAREA 1 BASE YEAR DISTRIBUTION (B)	SUBAREA 1 2020 TOTAL (A X B)
Natural Resources and Construction	25,855	7%	1,773
Manufacturing	15,032	16%	2,369
Wholesale Trade	16,801	13%	2,145
Retail Trade	35,626	12%	4,133
Transportation and Utilities	12,054	9%	1,091
Information	9,795	1%	130
Financial Activities	50,640	1%	636
Professional and Business Services	69,315	9%	5,982
Educational and Health Services	56,949	8%	4,792
Leisure and Hospitality	32,813	9%	3,022
Other Services	19,786	11%	2,154
Government	41,969	8%	3,341
Total	386,634	-	31,568

FIGURE C14: SUBAREA EMPLOYMENT GROWTH, 2020-2050

SUBAREA	2010	2020	2030	2040	2050	2010-2050 GROWTH
1 - North Suburbs	27,820	31,568	34,478	37,645	39,667	11,848
2 - East DM	47,571	54,473	59,747	65,207	68,703	21,133
3 - CBD	64,355	72,652	78,614	84,994	88,125	23,770
4 - South DM	29,539	34,403	37,660	40,914	42,769	13,230
5 - SW Suburbs	90,275	101,785	110,127	118,993	123,410	33,135
6 - NW Des Moines	28,969	34,260	38,103	42,330	45,723	16,754
7 - NW Suburbs	50,255	57,493	62,634	67,834	70,697	20,441
Total	338,784	386,634	421,364	457,918	479,094	140,311

Step 3: Determine Subarea Population Forecasts

As with Step 2, MPO staff used the methodology prescribed in the report Existing Conditions Analysis and Baseline Projections for The Tomorrow Plan, prepared by Gruen Gruen + Associates in November 2011, as a template for the 2050 Growth Scenario. This methodology also is based upon analysis of REMI forecasts by county and upon historical growth trends, as well as the relationship between employment growth and housing demand.

As with the employment forecast, the first step was to look at county-level population forecasts and adjust to develop a MPA forecast. REMI provided forecasts for each county out to 2050. In reviewing historical growth from 1990 to 2010, the four-county area saw an average annual rate of growth of 1.62 percent. This is slightly lower than growth observed in the MPA over the same timeframe, which had an average annual rate of growth of 1.71 percent, or 105.56 percent that of the four-county area. Therefore, the four-county area's growth rates were adjusted by multiplying the five-year growth rate by 105.56 percent resulting in MPA growth rates. These rates were applied to the base year population and housing unit figures, which were derived from the 2010 Census. Figure C15 illustrates population forecast for the four-county area and the MPA.

FIGURE C15: POPULATION FORECAST, 2010-2050

YEAR	DALLAS	MADISON	POLK	WARREN	4-COUNTY TOTAL	COUNTY 5-YEAR GROWTH RATES	MPA 5-YEAR GROWTH RATE	MPA TOTAL	MPA TOTAL HOUSING UNITS
2010	66,135	15,679	430,640	46,225	558,679	-	-	480,266	202,419
2015	81,000	16,388	462,031	49,579	608,998	1.740%	1.836%	526,014	221,701
2020	91,583	16,857	483,257	52,147	643,844	1.119%	1.181%	557,823	235,107
2025	100,118	17,459	502,712	54,803	675,092	0.952%	1.005%	586,431	247,165
2030	107,311	18,215	522,727	57,353	705,606	0.888%	0.937%	614,438	258,969
2035	113,802	19,012	545,126	59,491	737,431	0.886%	0.935%	643,719	271,310
2040	120,506	19,812	571,353	61,409	773,080	0.949%	1.001%	676,601	285,169
2045	127,850	20,621	600,557	63,457	812,485	0.999%	1.055%	713,045	300,529
2050	135,758	21,534	630,203	66,012	853,507	0.990%	1.045%	751,088	316,563

Source: REMI Policy Insight Mode, February 2011; US Census Bureau

Once the MPA forecasts were determined, subarea forecasts could be calculated. Subarea population growth was determined as a factor of employment growth. A housing units created per job ratio was determined for each subarea. This ratio was developed in part based on a review of historical housing and job data at the community level with adjustments made based on interviews with representatives from MPO member communities. The units added per job ratio was used to develop an allocation factor for each subarea. This allocation factor was calculated by taking the subarea employment growth multiplied by the units added per job ratio, and dividing that product by the MPA's total employment growth. The allocation percentage represents the percent of the total population allocated to each subarea for a given year, as illustrated in Figure C16. The allocation factors for each subarea and each time increment were then applied to the MPA forecasts for housing units and population, as shown in Figure C17.

FIGURE C16: GROWTH ALLOCATION PERCENTAGE BY SUBAREA

SUBAREA	UNITS PER JOB	ALLOCATION PERCENTAGE BY YEAR							
		2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050
1 - North Suburbs	2.88	19%	20%	20%	21%	21%	22%	22%	26%
2 - East DM	1.44	19%	16%	19%	19%	18%	19%	19%	22%
3 - CBD	0.35	5%	7%	5%	5%	5%	5%	5%	4%
4 - South DM	1.44	13%	12%	12%	11%	11%	11%	11%	10%
5 - SW Suburbs	1.15	24%	24%	24%	24%	24%	24%	22%	17%
6 - NW Des Moines	0.48	4%	5%	5%	5%	5%	5%	6%	8%
7 - NW Suburbs	1.22	16%	16%	16%	15%	15%	15%	15%	13%

FIGURE C17: POPULATION AND HOUSING UNIT FORECAST BY SUBAREA, 2010-2050

SUBAREA	2010		2020		2030		2040		2050	
	UNITS	POP.								
1 - North Suburbs	22,296	55,916	28,712	71,353	33,650	83,068	39,273	96,410	46,797	114,260
2 - East DM	38,263	95,422	44,115	109,512	48,590	120,129	53,439	131,633	59,941	147,062
3 - CBD	4,877	7,435	6,652	11,697	7,883	14,617	9,261	17,886	10,575	21,004
4 - South DM	30,259	73,333	34,413	83,329	37,176	89,884	40,065	96,738	43,402	104,657
5 - SW Suburbs	42,010	95,794	49,876	114,721	55,537	128,153	61,826	143,074	67,985	157,689
6 - NW Des Moines	35,530	78,815	37,064	82,502	38,151	85,081	39,404	88,052	41,600	93,263
7 - NW Suburbs	29,020	72,067	34,274	84,710	37,981	93,506	41,902	102,809	46,262	113,153
Total	202,255	478,782	235,107	557,823	258,969	614,438	285,169	676,601	316,563	751,088

Step 4: Subdivide Subarea Control Totals to Jurisdictions

To help subdivide subarea controls totals to TAZs, the MPO's Planning Subcommittee recommended that the subarea totals first be allocated to each jurisdiction. To accomplish this, each TAZ was assigned to a city or county based on each jurisdiction's future land use map. Note that TAZs do not always follow jurisdictional boundaries. Where a TAZ was split across two or more jurisdictions, the TAZ was assigned to the jurisdiction with a larger percentage of the TAZ.

Once TAZs were assigned to jurisdictions, each jurisdiction's share of each subarea's base year housing units and employment was calculated. MPO staff then looked back at growth allocated in The Tomorrow Plan's Scenarios 3 and 4 and determined each jurisdiction's share of each subarea's 2050 housing units and employment. Note that The Tomorrow Plan only forecast the year 2050 allocation with no interim year data provided. Each jurisdiction's share of each subarea's 2050 housing units and employment for Scenario 3 and Scenario 4 was averaged, and this percent was then applied to the updated 2050 control totals for each subarea (note that subarea totals changed slightly from The Tomorrow Plan growth scenarios to the Mobilizing Tomorrow growth scenario due to updates in base year employment data). The change in each jurisdiction's share of the subarea total between 2010 and 2050 was then calculated and divided by 40 resulting in an annual percent change. An example from Subarea 1 is provided in Figure C18.

FIGURE C18: JURISDICTION CONTROL TOTAL EXAMPLE

JURISDICTION	2010		SCENARIO 3 (2050)		SCENARIO 4 (2050)		AVERAGE (2050)		ANNUAL PERCENT CHANGE IN SUBAREA SHARE (2010 TO 2050)	
	UNITS	POP.	UNITS	POP.	UNITS	POP.	UNITS	POP.	UNITS	POP.
Subarea Total	22,296	27,824	47,455	40,448	46,767	40,445	47,111	40,447	-	-
Ankeny	19,583	26,236	39,342	37,394	41,604	34,602	40,473	35,998	-	-
Percent of Subarea	88%	94%	83%	92%	89%	86%	86%	89%	-0.05%	-0.13%
Polk City	1,336	654	5,039	845	2,109	2,304	3,574	1,575	-	-
Percent of Subarea	6%	2%	11%	2%	5%	6%	8%	4%	0.04%	0.04%
Polk County	1,377	934	3,074	2,209	3,054	3,539	3,064	2,874	-	-
Percent of Subarea	6%	3%	7%	6%	7%	9%	7%	7%	0.01%	0.09%

The calculated annual percent change for each jurisdiction was then applied to the 2010 share resulting in interim year percent of subarea figures. These percentages were then applied to the housing unit and employment control totals for each subarea, resulting in jurisdictional control totals for each time increment. These control totals, summarized in Figure C19, were provided to each jurisdiction and used in Step 5.

Step 5: Growth Allocation

Each jurisdiction used its control total from Step 4 to allocate growth through the region. To aid in this process, the MPO staff used the scenario planning software Envision Tomorrow. Envision Tomorrow is a free tool that integrates an ArcGIS mapping extension with Microsoft Excel files. The user is able to “paint” areas on a map with different land uses. Each land use can contain different building types and development densities, which are then used to calculate population and employment growth.

MPO staff set up a template for each community and worked with the Planning Subcommittee to develop general land uses for each community to use. MPO staff also set up a geodatabase built off county assessor records. As noted in the discussion of geography earlier in document, a five-acre grid was placed over the parcel map which resulted in the subdivision of some parcels in order to keep parcel sizes less than five acres. Constrained land uses also were identified based on sensitive area information collected through The Tomorrow Plan’s development. MPO staff then met with representatives from most all communities to identify areas of growth and/or redevelopment within their jurisdictions. Community representatives were able to “paint” development or redevelopment, shown in Figure C20, until their allotment of growth was expended.

Step 6: Growth Aggregated to TAZs

Once growth for all jurisdictions was allocated for each time horizon, the parcel-based geographies were aggregated to TAZs using ArcGIS.

FIGURE C20: GROWTH DENSITIES

LAND CLASS	DENSITY/ ACRE
CBD Urban Residential	20 units
Urban Residential	10 units
Suburban Residential	5 units
Rural Residential	0.8 units
Retail	21 jobs
Office	39 jobs
Industrial	8 jobs
Public/Civic	17 jobs
Education	13.5 jobs
Hotel/Hospitality	11 jobs

FIGURE C19: GROWTH TOTALS BY JURISDICTION

JURISDICTION	2010		2020		2030		2040		2050	
	UNITS	JOBS								
Altoona	6,175	8,504	7,201	9,217	8,055	9,537	8,995	9,783	10,242	9,649
Ankeny	19,583	26,236	25,081	29,348	29,232	31,598	33,928	34,003	40,203	35,304
Bondurant	1,788	1,141	2,131	1,403	2,433	1,645	2,770	1,911	3,213	2,135
Carlisle	1,775	1,540	2,074	2,125	2,299	2,689	2,542	3,316	2,823	3,878
Clive	6,652	16,007	7,880	18,054	8,754	19,535	9,714	21,106	10,674	21,890
Subarea 5	5,610	15,501	6,534	17,486	7,135	18,929	7,786	20,464	8,390	21,235
Subarea 7	1,042	506	1,346	567	1,619	605	1,927	642	2,283	655
Cumming	136	81	306	472	501	923	736	1,442	1,006	1,957
Dallas County	32	-	35	8	36	17	36	28	36	39
Des Moines	90,584	143,575	100,378	165,351	107,019	181,230	114,154	198,090	123,314	208,654
Subarea 2	22,948	25,572	25,954	29,994	28,157	33,674	30,494	37,599	33,673	40,507
Subarea 3	4,877	64,356	6,652	72,652	7,883	78,614	9,261	84,994	10,575	88,125
Subarea 4	26,675	26,775	30,120	30,632	32,303	32,933	34,559	35,127	37,164	36,039
Subarea 6	34,620	25,940	36,036	30,955	37,012	34,733	38,143	38,927	40,181	42,415
Subarea 7	1,464	932	1,615	1,119	1,664	1,276	1,697	1,443	1,720	1,569
Grimes	3,768	4,242	4,662	5,328	5,401	6,323	6,218	7,409	7,151	8,307
Johnston	6,562	15,744	7,596	17,060	8,247	17,548	8,911	17,883	9,630	17,467
Mitchellville	688	656	817	718	929	750	1,054	778	1,219	777
Norwalk	3,682	2,262	4,635	2,837	5,472	3,354	6,423	3,921	7,470	4,384
Subarea 4	1,622	1,228	2,016	1,599	2,362	1,934	2,745	2,302	3,190	2,616
Subarea 5	2,060	1,034	2,619	1,239	3,110	1,420	3,677	1,619	4,281	1,768
Pleasant Hill	4,455	3,222	5,176	3,990	5,770	4,706	6,420	5,495	7,286	6,168
Polk City	1,336	654	1,835	864	2,285	1,076	2,823	1,320	3,550	1,544
Polk County	4,804	12,431	5,829	13,854	6,703	14,700	7,688	15,515	8,989	15,800
Subarea 1	1,377	934	1,797	1,356	2,133	1,804	2,522	2,322	3,044	2,819
Subarea 2	2,373	8,469	2,836	9,151	3,246	9,435	3,705	9,641	4,308	9,466
Subarea 4	19	-	22	39	23	85	25	138	27	192
Subarea 6	910	3,028	1,028	3,306	1,139	3,370	1,260	3,403	1,419	3,308
Subarea 7	125	-	146	3	161	7	176	11	192	15
Urbandale	15,633	27,375	17,896	31,847	19,203	35,272	20,492	38,826	21,859	41,116
Warren County	174	-	189	10	195	21	201	34	207	48
Subarea 4	168	-	183	9	188	20	193	32	199	45
Subarea 5	6	-	7	1	7	1	8	2	8	3
Waukee	5,424	6,210	6,705	6,843	7,757	7,216	8,943	7,586	10,203	7,651
Subarea 5	5,030	4,753	5,728	5,282	6,108	5,631	6,498	5,994	6,813	6,122
Subarea 7	394	1,457	977	1,561	1,649	1,585	2,445	1,592	3,390	1,529
West Des Moines	27,175	66,085	32,468	74,128	36,381	79,790	40,755	85,766	45,095	88,487
Windsor Heights	1,993	2,822	2,213	3,178	2,295	3,434	2,365	3,705	2,393	3,838
Total	202,419	338,787	235,107		258,969	421,364	285,169	457,918	316,563	

Figures C20 and C21 illustrate the forecasted population and employment growth, respectively.

FIGURE C20: MAP OF POPULATION GROWTH , 2010-2050

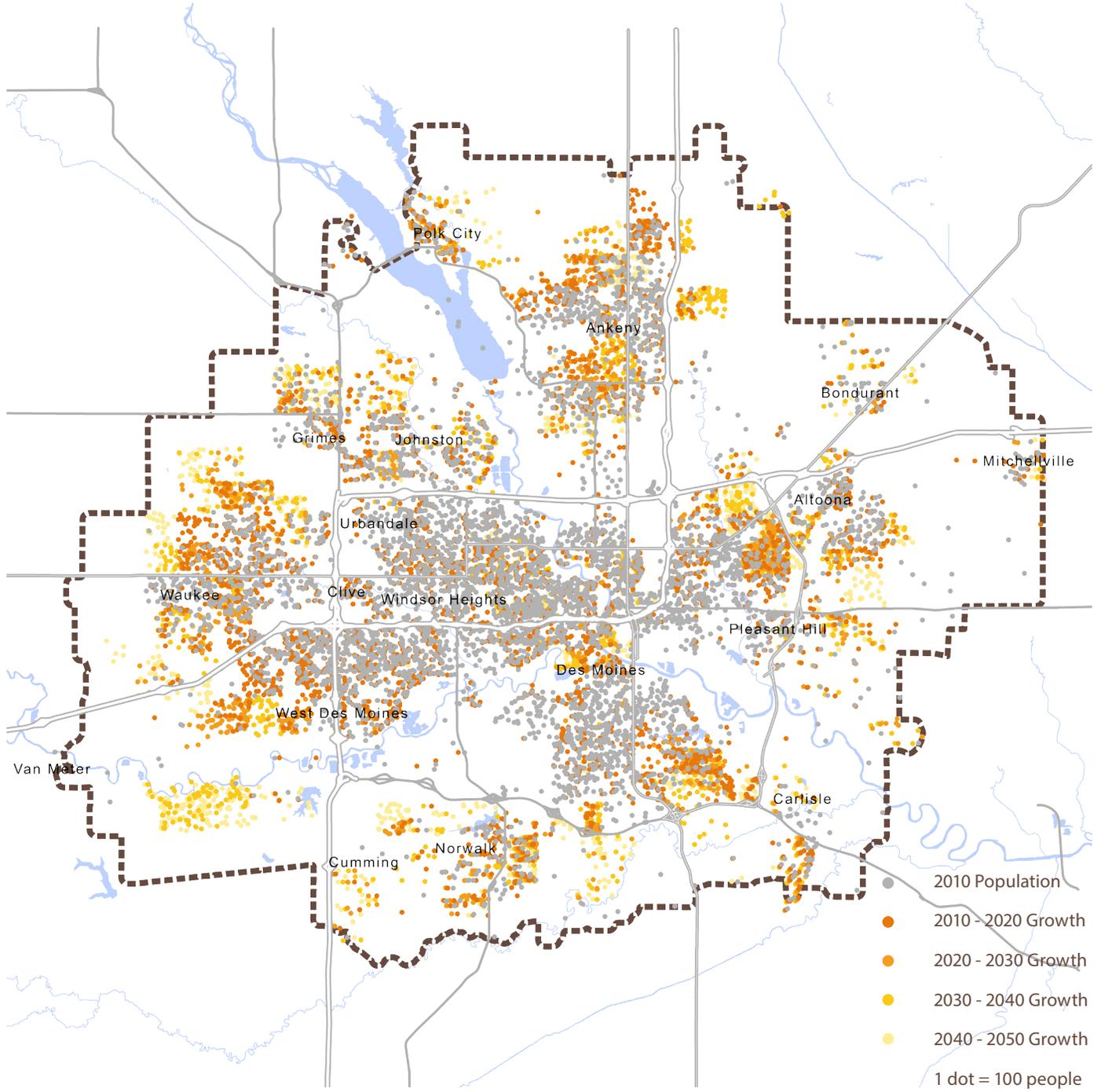
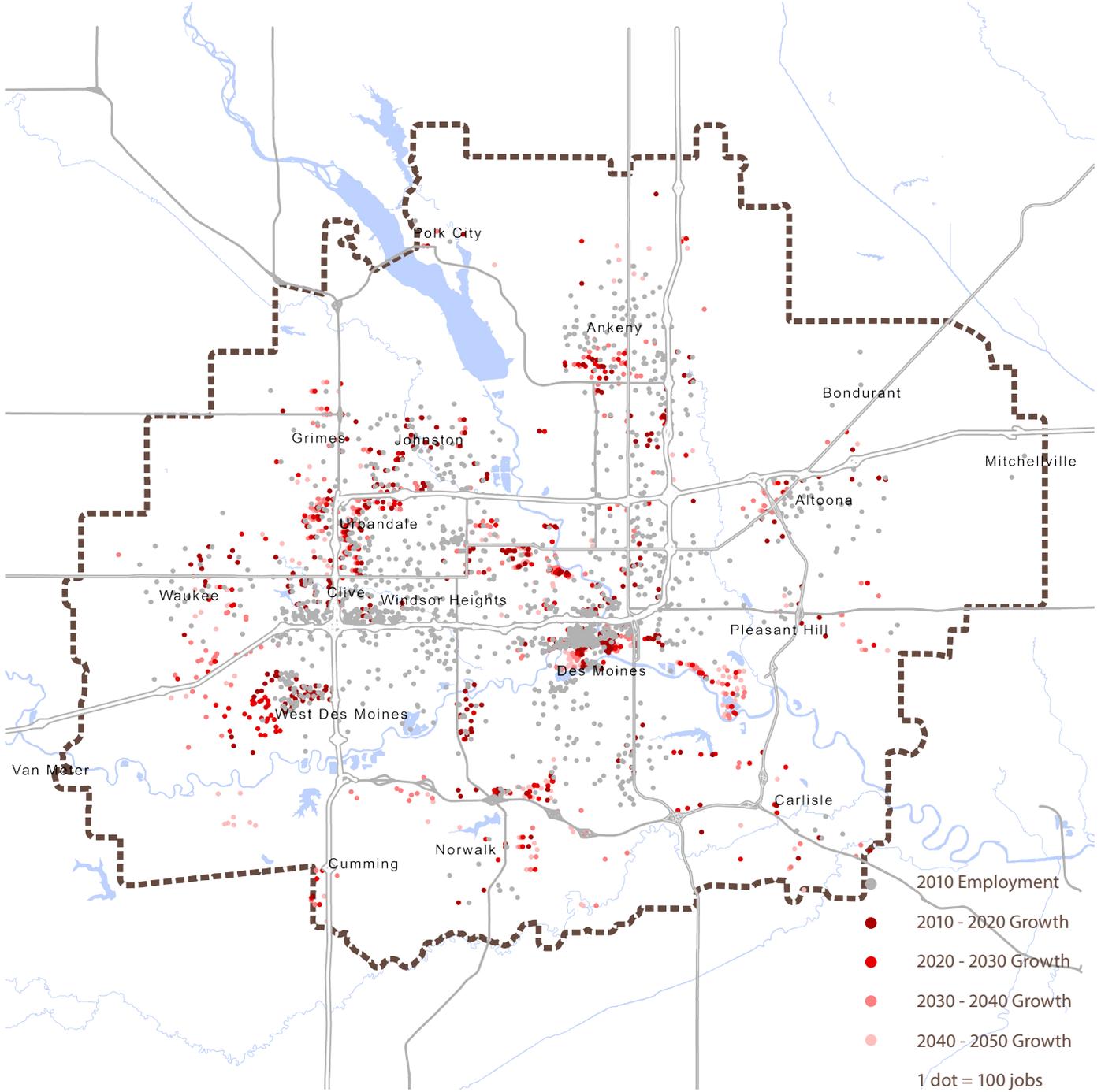


FIGURE C21: MAP OF EMPLOYMENT GROWTH , 2010-2050



Impact on Transportation

The Greater Des Moines region is growing. Population is projected to increase nearly 60 percent from 480,000 in 2010 to 751,000 by 2050, and employment is expected to increase by 40 percent by 2050. More critical to transportation, however, is the fact that the demographics of Greater Des Moines are shifting. The population over the age of 65 will increase from approximately 53,000 to 155,000, an increase of nearly 200 percent. This population will go from roughly 10 percent of the population to roughly 20 percent. As the region's population ages, what will this mean for the transportation system? At the same time, Greater Des Moines must prepare for the XYZ factor. Those individuals aged 45 and younger – these population cohorts make up approximately two-thirds of our region's population and exhibit different lifestyle choices and preferences than they have in the past.

They seek communities with a mix of uses within walking distance and many of them do not necessarily want to own an automobile.¹ A recent study showed that new car purchases dropped 30 percent from 2008-2012 for people aged 18-34 year old.² Over time, Vehicle Miles Travelled (VMT) has steadily increased. However, around the turn of the century VMT peaked. Since the mid-2000s, VMT (per capita 2004 & Total 2007) have both declined.³ Young people, age 16-34, are driving this trend with a 23 percent drop in average VMT from 2001 to 2009.⁴ In that same time period, biking trips increase 24 percent, walking trips increased 16 percent, and transit trip increased 40 percent in 16-34 year olds.⁵

These trends are likely to persist and have profound implications for our transportation system. For decades, transportation policy and investment was based on the assumption that automobile use will continue to increase indefinitely – this mind set persist today despite the increasing evidence that automobile use is in decline. However, this mind set is beginning to shift as is evident in recent statements from the Transportation Secretary of the U.S. Department of Transportation which emphasized moving people over moving cars.⁶

The demographic and economic circumstances driving the decline in automobile use present the region with an opportunity to use our limited resources to create a transportation system that will meet our needs 10, 20, and 40 years from now. Due to these reasons, Mobilizing Tomorrow recommends increased investment in maintenance and multimodal transportation options and reduced emphasis in the expansion of the roadway system.

1 Belden, Russonelo, & Stewart. The 2011 Community Preference Survey: What Americans Are Looking For When Deciding Where to Live. Research Report, National Association of Realtors, 2011.

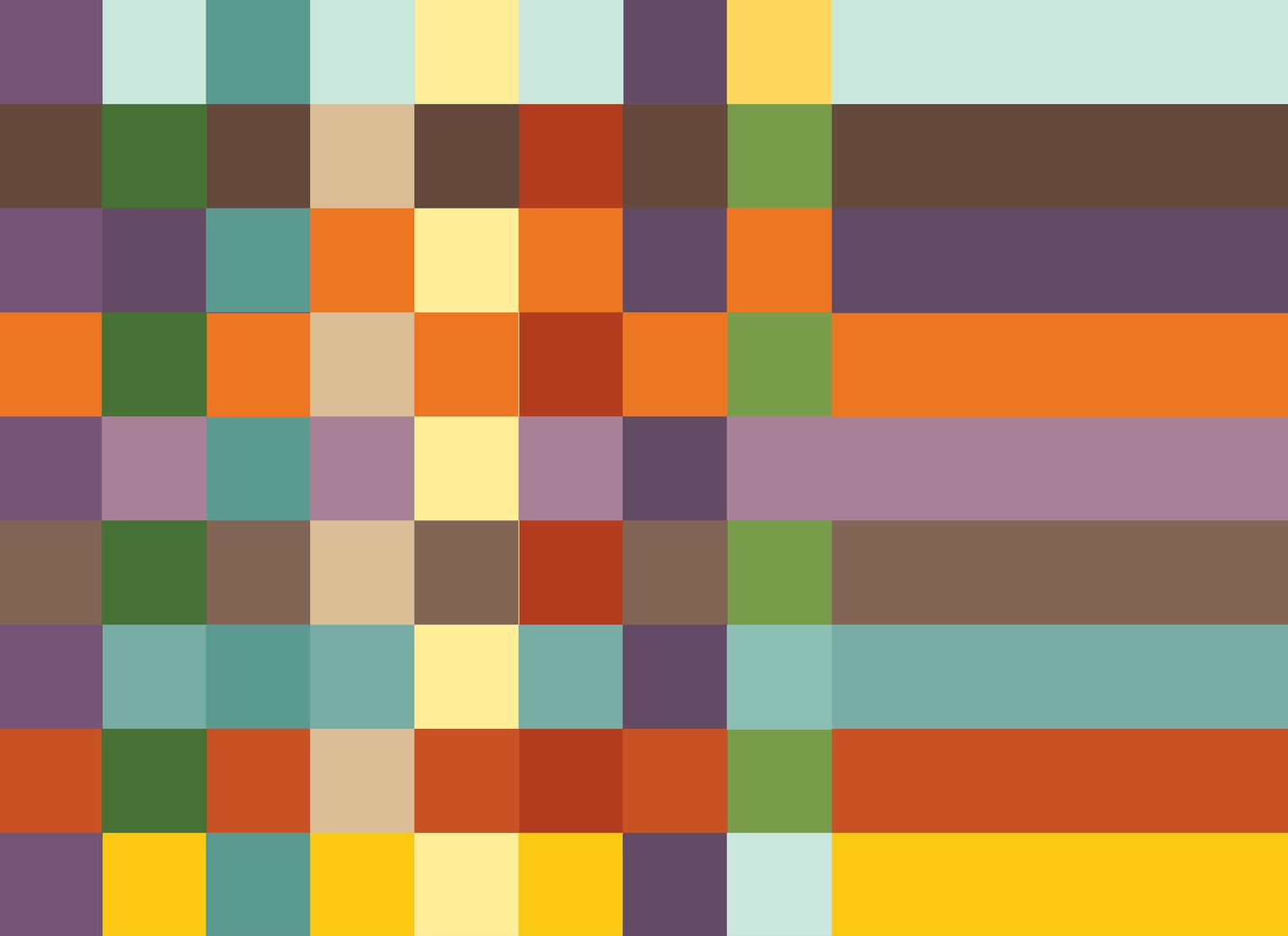
2 Hargreaves, S. Young Americans Ditch the Car. September 17, 2012. <http://money.cnn.com/2012/09/17/news/economy/young-buying-cars/index.html>

3 <http://www.ssti.us/2013/02/per-capita-vmt-ticks-down-for-eighth-straight-year/>

4 http://www.uspirg.org/sites/pirg/files/reports/Transportation%20%26%20the%20New%20Generation%20vUS_0.pdf

5 http://www.uspirg.org/sites/pirg/files/reports/Transportation%20%26%20the%20New%20Generation%20vUS_0.pdf

6 <http://www.politico.com/story/2014/09/anthony-foxx-department-of-transportation-110656.html#ixzz3CjLXkpOZ>





APPENDIX D: FISCAL ANALYSIS METHODOLOGY

FISCAL ANALYSIS METHODOLOGY

Appendix D provides supplemental information about the Des Moines Area Metropolitan Planning Organization's (Des Moines Area MPO) methodology and assumptions used to estimate project costs and to develop funding revenue projections.

Cost Projections

This section is an overview of the Des Moines Area MPO's methodology and assumptions used to estimate project costs and revenue projections. These costs include project capital costs and operation and maintenance costs.

Project Costs

The Des Moines Area MPO relied on local governments to estimate costs for their respective projects in 2014 dollars. Projects were submitted for the follow three time periods, 2015-2024, 2025-2034, and 2035-2050. Projects costs were determined using a year of expenditure (YOE) calculated on the midpoint of each of the time periods¹². The Des Moines Area MPO used a four percent annual inflation rate recommended by the Federal Highway Administration (FHWA) to convert these costs into YOE dollars³. The Des Moines Area MPO assumed that some projects would be constructed or implemented prior to the HY 2024, 2034, and 2050, and used HY 2019, 2029 and 2039 as average YOE.

Historical Street and Highway Expenditures

The Des Moines Area MPO used data from the Iowa DOT's Street Finance Reports to determine expenditures on MPO member government's street and highway system for FY 2008-2013. Maintenance costs include costs associated with maintaining the existing physical infrastructure (i.e., pavement, signals, and right-of-way). Operation costs include costs associated with snow removal, street lighting, equipment purchases, administration, and other related costs. Construction costs include engineering, right-of-way purchase, and the construction of bridges and streets. Debt service includes principal and interest payments made on municipal bonds. Figure D1 provides a summary of street and highway expenditures over the past six federal fiscal years.

1 YOE refers to the year a project is completed. The Des Moines Area MPO assumed some projects would be completed prior to the HY and identified HY 2019, 2029, and HY 2039 as average YOE.

2 FY refers to the State Fiscal Year (July 1 through June 30).

3 U.S. Department of Transportation, Federal Highway Administration, Financial Planning and Fiscal Constraint for Transportation Plans and Programs Questions and Answers, April 15, 2009.

FIGURE D1: HISTORICAL STREET & HIGHWAY EXPENDITURES

FEDERAL FISCAL YEAR	MAINTENANCE	OPERATIONS	CONSTRUCTION	DEBT SERVICE	TOTAL
2008	\$29,676,308	\$18,870,821	59,188,963	60,795,750	\$168,531,842
2009	\$27,039,735	\$14,613,676	77,941,705	81,461,389	\$201,056,505
2010	\$29,166,472	\$13,256,200	80,117,091	89,608,542	\$212,148,305
2011	\$27,192,080	\$12,815,786	78,324,928	95,174,456	\$213,507,250
2012	\$28,172,061	\$20,824,569	66,810,766	84,958,117	\$200,765,513
2013	\$33,490,648	\$13,206,117	66,608,096	73,533,803	\$186,838,664
Total	\$174,737,304	\$93,587,169	\$428,991,549	\$485,532,057	\$1,182,848,079
6-Year Average	\$29,122,884	\$15,597,862	\$71,498,592	\$80,922,010	\$197,141,347
Percent of Expenditures	15%	8%	36%	41%	100%

Revenue Projections

The Des Moines Area MPO considered three revenue types when developing future funding estimates: federal, state, and local funds.

Federal Funding

Federal funds allocated to states and local governments are derived from modal trust funds funded through user fees. The Highway Revenue Act of 1956 created the Highway Trust Fund (HTF) to provide a dependable source of funding for the Interstate System. The HTF is funded through user fees applied to fuel taxes, heavy vehicle use taxes, and taxes on purchases of trucks and truck tires. The HTF has two divisions; the highway account and the mass transit account. According to the Iowa DOT, Iowa contributed \$499.2 million to the highway account and \$65.8 million to the mass transit account in 2012. The HTF's highway account provides funds for a number of programs, ranging from construction and maintenance to safety. The HTF's mass transit account provides funds for the construction and operation of transit systems.

Federal funds that flow directly to the MPO include Surface Transportation Program (STP) and Transportation Alternative Program (TAP) funding. Figure D2 provides a summary of historic STP and TAP funding levels for the MPO.

The MPO used historic data going back to 1996 to determine the historic annual growth rate for STP and TAP funding over the 19 year period. The historic growth rate for STP and TAP funding was reviewed by the MPO Finance Subcommittee. Their recommendation was to use a conservative 5 percent annual growth rate to project federal funding for Mobilizing Tomorrow. This approach was based on the overall uncertainty concerning transportation funding at the federal level and congresses unwillingness to pass a gas tax increase to address the HTF shortfall. Staff used the 5 percent growth rate to determine an annual funding increase of \$191,000. The annual funding increase was added to each year to create a straight line projection of STP and TAP funding that is expected to be available through 2050. Figure D3 provides a summary for projected STP and TAP funding through 2050.

FIGURE D2: HISTORICAL STP & TAP FUNDING

FEDERAL FISCAL YEAR	STP FUNDING	TAP FUNDING
1996	\$3,811,000	N/A
1997	\$3,614,000	N/A
1998	\$3,614,000	N/A
1999	\$4,851,000	\$442,000
2000	\$5,690,000	\$466,000
2001	\$6,088,000	\$508,000
2002	\$6,222,000	\$525,000
2003	\$6,233,000	\$518,000
2004	\$7,150,000	\$585,000
2005	\$7,960,000	\$672,000
2006	\$5,860,000	\$541,000
2007	\$5,812,000	\$549,000
2008	\$7,112,000	\$580,000
2009	\$8,084,000	\$622,000
2010	\$9,013,000	\$669,000
2011	\$10,275,000	\$708,000
2012	\$10,581,000	\$799,000
2013	\$10,102,000	\$768,000
2014	\$11,743,000	\$1,177,000
Percent Change 1999-2014	208%	166%
Average Annual Percent Change	13%	10%

FIGURE D3: PROJECTED STP & TAP FUNDING THROUGH HY 2050

FUNDING TYPE	2015-2024	2025-2034	2035-2050	TOTAL
STP	\$121,731,248	\$139,685,000	\$263,224,000	\$524,640,248
TAP	\$12,109,760	\$14,180,000	\$27,264,000	\$53,553,760
Total	\$133,841,008	\$153,865,000	\$290,488,000	\$578,194,008

State Funding

Funds derived from State-assessed fees on fuel, motor vehicle sales, vehicle registrations, and other transportation-related transactions support numerous funding programs. The following sections describe State of Iowa funding programs available for streets and highways, bicycle and pedestrian facilities, and public transportation systems.

The State of Iowa's primary revenue source is the Road Use Tax Fund (RUTF). The 53rd Iowa General Assembly created the RUTF in 1949 to provide a dependable source of funding for the State of Iowa's primary, secondary, and municipal street and highway system. Similar to the HTF, the RUTF is funded through user fees. These user fees include fuel taxes, motor vehicle registration fees, motor vehicle use tax, driver's license fees, and other miscellaneous sources.

Table D4 shows the total historic RUTF revenues for MPO member governments for 2008 to 2013. The annual growth rate over the six years of available data was 3 percent. The MPO Finance Subcommittee reviewed the growth rate for RUTF's and determined that a 3 percent rate could reasonably be expected to continue into the foreseeable future. Staff used the 3 percent growth rate to determine an annual funding increase of approximately \$1.3 million for RUTF. Figure D4 provides a summary of projected RUTF through 2050.

FIGURE D4: HISTORICAL RUTF

FUNDING TYPE	2008	2009	2010	2011	2012	2013	ANNUAL GROWTH RATE
RUTF	\$44,870,155	\$43,764,491	\$45,986,236	\$48,701,795	\$53,641,310	\$53,375,607	3%

Local Funding

The MPO member governments and participating agencies generate local revenues for transportation improvements. Sources include debt service (proceeds from bonds sold, notes, and loans) property taxes, tax increment financing districts (TIF), special assessments, and developer contributions. One should note that local revenue sources, as well as the amount of revenues generated, are the decisions of the local jurisdiction.

Table D5 shows the historic local revenues for MPO member governments for 2008 to 2013. The annual growth rate over the six years of available data was zero percent. The MPO Finance Subcommittee reviewed the growth rate for RUTF's and determined that a zero percent rate could reasonably be expected to continue into the foreseeable future. This decision was based on the historic average being viewed as a long-term trend rather than an anomaly and the likely effect of the property tax rollback passed by the state legislature. Staff determined the six year average of \$133 million in local funding. The six year average use used to account for fluctuations in bonding levels by local communities on a year-to-year basis. Figure D5 provides a summary of projected local funding through 2050.

FIGURE D5: HISTORICAL LOCAL FUNDING

FUNDING TYPE	2008	2009	2010	2011	2012	2013	ANNUAL GROWTH RATE
Local Funding	\$121,075,865	\$136,861,125	\$134,530,309	\$158,209,158	\$132,030,720	\$119,837,862	0%

Total Funding

Figure D6 shows the projected federal, state, and local funding that is reasonably expected to be available over the life of the plan. A review of the Street Finance Reports over the last six years indicated that only 36 percent of the available state and local revenue for transportation is spent on construction expenditures, as indicated in Figure D1. The projections assume that this trend will continue into the future. Therefore 64 percent of the projected state and local revenues were subtracted from the total available revenue to accurately reflect operation, maintenance, and debt service costs. It was assumed that these costs would remain consistent as a percentage of the total projected revenue for each time period of Mobilizing Tomorrow.

FIGURE D6: PROJECTED FEDERAL, STATE, & LOCAL FUNDING THROUGH HY 2050

FUNDING TYPE	2015-2024	2025-2034	2035-2050	TOTAL
Federal	\$133,841,008	\$153,865,000	\$290,488,000	\$578,194,008
State	\$607,164,389	\$716,159,429	\$1,372,564,769	\$2,695,888,586
Local	\$1,337,575,065	\$1,337,575,065	\$2,140,120,105	\$4,815,270,235
Non-Construction Expenditures	(\$1,244,633,250)	(\$1,314,390,076)	(\$2,248,118,319)	(\$4,807,141,645)
Total Revenue	\$833,947,211	\$893,209,418	\$1,555,054,554	\$3,282,211,184

Fiscal Capacity

MPO Funding

The MPO developed an investment strategy for the Mobilizing Tomorrow that targets funding into six categories – roadway, system preservation and optimization, bridge, transit, transportation alternatives, and flex. The investment strategy recommended by the MPO considers only federal funds the MPO controls (STP & TAP funds) and non-federal match at a 40 percent federal – 60 percent non-federal ratio. For purposes of forecasting revenue for fiscal constraint, the transit, system preservation and optimization, and bridge categories are dedicated set-asides with minimum funding targets (10 percent of STP funds each for transit and system preservation and optimization, and 15 percent of STP funds for bridges). A maximum of 60 percent of STP funds are targeted to fund the regionally significant roadway projects listed in this plan. An additional five percent of STP funds would be left unallocated in a flex category, which would be available to any eligible STP use in a given year. TAP funds would be dedicated exclusively to transportation alternatives. Figure D7 summarizes the breakdown of available STP and TAP funds considered in each time period of Mobilizing Tomorrow.

Figure D8 shows the amount of local funding (RUTF + local funding sources) available compared to the amount of funds necessary to match the projected STP and TAP through 2050. The table also includes the additional \$10 million annually to maintain the current system while still have a positive balance in each of the plans time periods. Figure D9 shows that the MPO has the fiscal capacity to match the projected STP and TAP funds that are expected to be available over the next 36 years.

FIGURE D7: MPO FUNDING AVAILABLE

FUNDING CATEGORY	2015-2024	2025-2034	2035-2050	TOTAL
Federal Funds by Category (40% of Funding)				
STP Funds	\$121,731,000	\$139,685,000	\$263,244,000	\$524,640,000
System Preservation & Optimization (10% of STP)	\$12,173,000	\$13,968,500	\$26,324,400	\$52,464,000
Bridge (15% of STP)	\$18,259,650	\$20,952,750	\$39,486,600	\$78,696,000
Roadway (60% of STP)	\$73,038,600	\$83,811,000	\$157,946,400	\$314,784,000
Transit (10% of STP)	\$12,173,100	\$13,968,500	\$26,324,400	\$52,464,000
Flex (5% of STP)	\$6,086,550	\$6,984,250	\$13,162,200	\$26,232,000
TAP Funds	\$12,109,760	\$14,180,000	\$27,264,000	\$53,553,760
Total Federal Funds	\$133,841,000	\$153,865,000	\$290,488,000	\$578,194,000
Local Match Funds by Category (60% of Funding)				
STP Match	\$182,596,500	\$209,527,500	\$394,866,000	\$786,960,000
System Preservation & Optimization	\$18,259,650	\$20,952,750	\$39,486,600	\$78,696,000
Bridge	\$27,389,475	\$31,429,125	\$59,229,900	\$118,044,000
Roadway	\$109,557,900	\$125,716,500	\$236,919,600	\$472,176,000
Transit	\$18,259,650	\$20,952,750	\$39,486,600	\$78,696,000
Flex	\$9,129,825	\$10,476,375	\$19,743,300	\$39,348,000
TAP Match	\$18,165,000	\$21,270,000	\$40,896,000	\$80,331,000
Total Matching Funds	\$200,761,500	\$230,797,500	\$435,762,000	\$867,291,000
Total Funding Available by Category (100% of Funding)				
STP-Eligible Total Revenue	\$304,327,500	\$349,212,500	\$658,110,000	\$1,311,600,000
System Preservation & Optimization	\$30,432,750	\$34,921,250	\$65,811,000	\$131,160,000
Bridge	\$45,649,125	\$52,381,875	\$98,716,500	\$196,740,000
Roadway	\$182,596,500	\$209,527,500	\$394,866,000	\$786,960,000
Transit	\$30,432,750	\$34,921,250	\$65,811,000	\$131,160,000
Flex	\$15,216,375	\$17,460,625	\$32,905,500	\$65,580,000
TAP-Eligible Total Revenue	\$30,275,000	\$35,450,000	\$68,160,000	\$133,885,000
Total Revenue Available	\$334,602,500	\$384,662,500	\$726,270,000	\$1,445,485,000

FIGURE D8: FISCAL CAPACITY OF MPO FUNDING

FUNDING TYPE	2015-2024	2025-2034	2035-2050	TOTAL
Available Matching Funds	\$700,106,000	\$739,344,000	\$1,264,567,000	\$2,704,017,000
Local Match Required	(\$182,501,850)	(\$209,844,750)	(\$396,275,400)	(\$788,595,000)
Additional Maintenance	(\$100,000,000)	(\$100,000,000)	(\$160,000,000)	(\$360,000,000)
Balance	\$417,604,150	\$429,499,250	\$708,291,600	\$1,555,422,000

Transit Funding

The Des Moines Area Regional Transit Authority (DART) incurs ongoing costs for its operations. DART staff worked with Des Moines Area MPO staff to inflate DART's FY 2014 operating budget by three percent annually to calculate future annual operating costs. Other cost, such as fleet replacement, were inflated by four percent annual to be consistent with historical rates. Figure D9 includes a summary of DART's historic revenues from 2005 to 2014. Figure D11 provides a summary of projected capital and operating funding through 2050.

FIGURE D9: HISTORICAL TRANSIT FUNDING 2005-2014

YEAR	FEDERAL	STATE	LOCAL	TOTAL
2005	\$6,417,277	\$763,407	\$9,970,746	\$17,151,430
2006	\$7,303,958	\$946,249	\$11,041,701	\$19,291,908
2007	\$6,266,309	\$854,951	\$12,310,679	\$19,431,939
2008	\$7,689,326	\$1,823,084	\$13,744,850	\$23,257,260
2009	\$15,879,406	\$904,185	\$15,223,756	\$32,007,347
2010	\$17,513,167	\$5,198,952	\$19,942,085	\$42,654,204
2011	\$11,475,441	\$1,817,433	\$13,558,251	\$26,851,125
2012	\$11,007,788	\$1,404,303	\$14,835,720	\$27,247,811
2013	\$8,397,274	\$1,585,152	\$20,631,058	\$30,613,484
2014	\$8,517,522	\$1,796,276	\$20,394,341	\$30,708,139
10 Year % Increase	33%	135%	105%	79%
Annual % Increase	3%	14%	10%	8%

Source: DART

DART staff provided forecasts for federal, state, and local sources of revenue based on historical trends as well as anticipated award of discretionary funds such as TIGER and/or FTA Small Starts for proposed bus rapid transit services. Specific annual increases by program are as follows:

- Section 5307: capital at three percent increase, operating at zero percent increase;
- Section 5310: three percent increase;
- Section 5311: two percent increase;
- STP: four percent increase;
- STA: three percent increase;
- Fares: one percent increase;
- Advertising: three percent increase;
- Other local (including property tax): increased as necessary to fund future needs;
- Discretionary (ICAAP, Section 5330, and Section 5309): assumes full federal maximum is received for applicable projects.

FIGURE D10 DART'S FEDERAL, STATE, AND LOCAL FUNDING PROJECTIONS THROUGH HY 2050

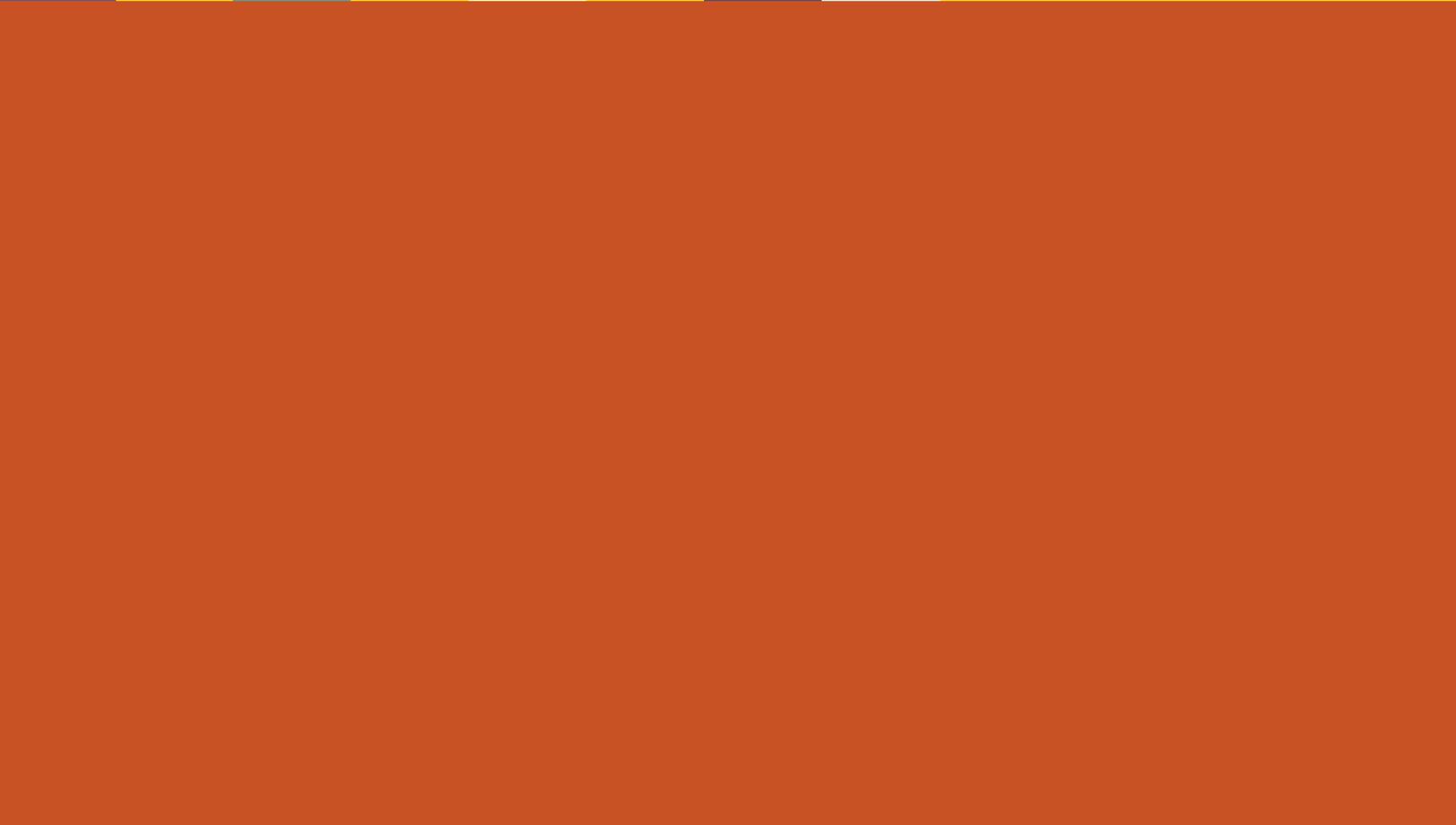
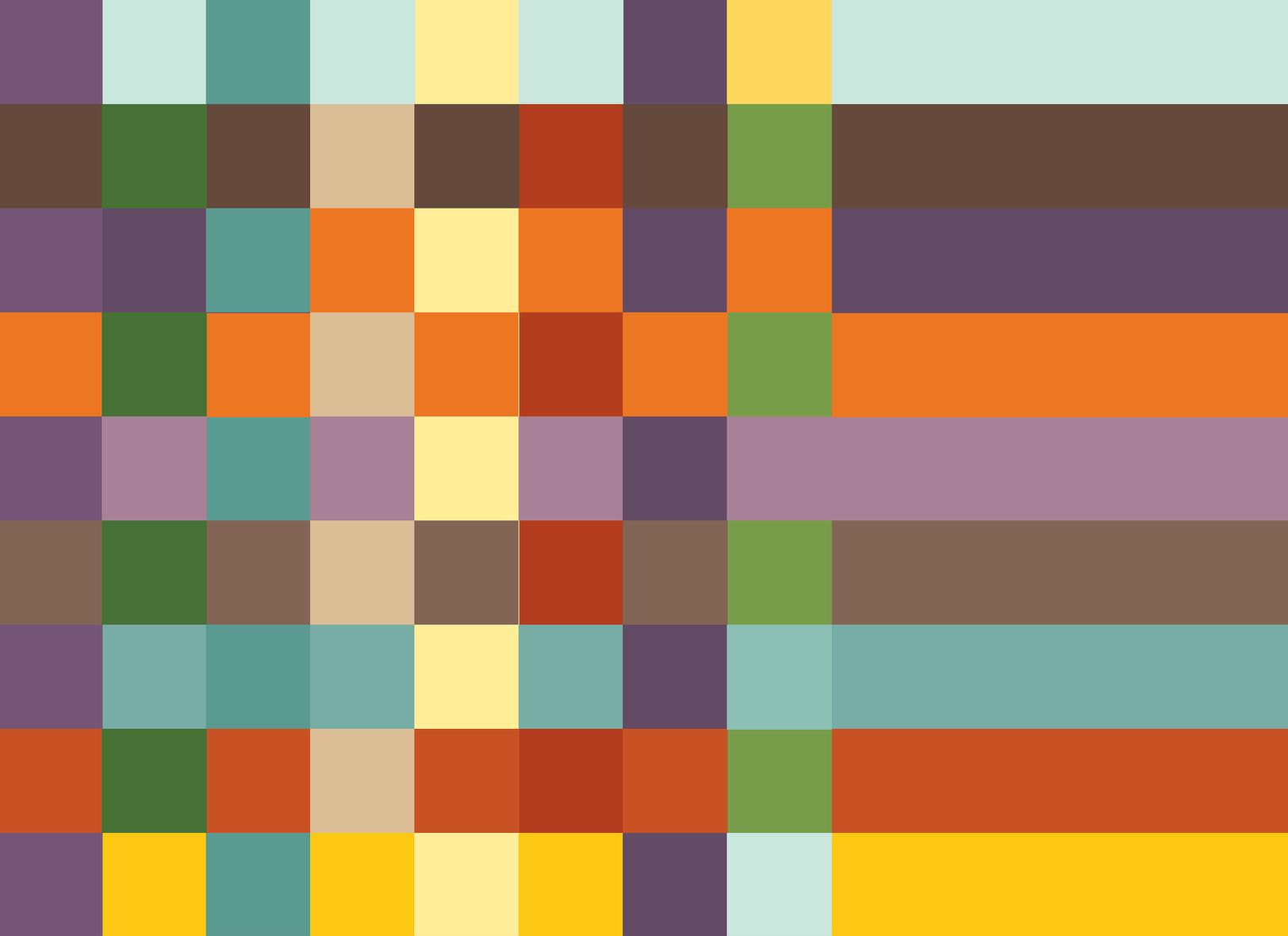
FUNDING CATEGORY	2015-2024	2025-2034	2035-2050	TOTAL
Transit Capital Funds				
Federal	\$108,820,000	\$140,645,000	\$212,837,000	\$462,302,000
State	\$2,095,000	\$0	\$0	\$2,095,000
Local	\$24,569,000	\$36,488,000	\$62,254,000	\$123,311,000
Total Capital	\$135,484,000	\$177,133,000	\$275,091,000	\$587,708,000
Transit Operating Funds				
Federal	\$43,582,000	\$44,796,000	\$75,270,000	\$163,648,000
State	\$13,183,000	\$17,717,000	\$41,819,000	\$72,719,000
Local	\$310,901,000	\$476,331,000	\$1,180,219,000	\$1,967,451,000
Total Operating	\$367,666,000	\$538,844,000	\$1,297,308,000	\$2,203,818,000
Total Funds				
Total Revenue Available	\$503,150,000	\$715,977,000	\$1,572,399,000	\$2,971,526,000

Iowa Department of Transportation Funding

Over the last 10 years, the Iowa DOT has invested an average of approximately \$68.5 million per year in the MPO planning area. Iowa DOT funding was projected by applying a 3 percent annual growth rate to the 10 year average. Figure D11 summarizes the funding available for projects on the DOT system.

FIGURE D11: IOWA DOT PROJECTED FUNDING THROUGH HY 2050

FUNDING TYPE	2015-2024	2025-2034	2035-2050	TOTAL
DOT Funding	\$803,025,000	\$1,003,525,000	\$2,033,080,000	\$3,839,630,000





APPENDIX E:
PROJECT SELECTION
METHODOLOGY +
PROJECT LIST

PROJECT SELECTION METHODOLOGY AND PROJECT LIST

Appendix E summarizes the process used to solicit, evaluate, and select capital projects for inclusion in Mobilizing Tomorrow. It also provides a list of projects included in the fiscally-constrained plan as well as a list of illustrative projects.

Project Solicitation

The MPO began soliciting projects from its member governments and the Iowa DOT on April 25, 2014, via an email to its Transportation Technical Committee and Policy Committee representatives. On May 6, 2014, the MPO staff sent an email clarifying questions received from communities about the submittal of maintenance projects. MPO staff clarified that maintenance projects through 2020 were desired, and that communities did not need to attempt identifying every maintenance project through 2050. A final reminder was emailed on May 15, 2014. In addition to these emails, MPO staff made announcements at meetings of the MPO's Technical, Executive, and Policy Committees.

MPO staff developed an online application for project sponsors to use. The application was designed to collect information for each project that related to performance measures that had been identified for inclusion in the plan. MPO staff developed an online map of all data gathered for performance measures (e.g., pavement condition, bridge condition, level of service, environmental justice areas, and so on). MPO staff made this map available, along with copies of performance measures and targets as well as project evaluation criteria, for member governments to consider as they developed project applications. In addition to the application, the MPO requested GIS shapefiles of projects submitted for consideration. The MPO received approximately 550 projects from member governments, the Iowa DOT, and DART.

Project Evaluation

Evaluation Criteria

MPO staff worked with the Planning and Engineering Subcommittees of the Transportation Technical Committee, as well as the Long-Range Transportation Plan Steering Committee, to develop project evaluation criteria against which projects would be reviewed. The criteria was intended to help identify projects that performed best at moving the region towards the identified performance measure targets.

The evaluation criteria were designed to be as objective as possible, relying on GIS data as well as responses from project applications. Twenty-six criteria were identified for use, as shown in Figure E1. Of these, 24 criteria rewarded positive points, while 2 deducted points. To receive a point, a project must have been either located in an area with an identified condition as indicated in a GIS map (e.g., poor pavement, deficient bridge, transit route, environmental justice area, and so on) or have a certain project characteristics as indicated in the project application (e.g., safety features, complete streets features, coordination with DART, and so on). Some criteria require both a location and a feature requirement to be met to receive a point. Each criterion satisfied provided the project with one point (or one negative point, in cases of point deductions). In other words, each criterion's possible scores were either 0 or 1 (or -1 in cases of point deductions).

Project Review

MPO staff reviewed each project against the performance criteria. Project shapefiles were compared against GIS data, and applications were reviewed to understand project characteristics. MPO staff determined whether evaluation criteria were met and awarded points accordingly.

Scoring Options

MPO staff worked with the Planning and Engineering Subcommittees to develop different options for summarizing project scores based on the evaluation criteria. Weighting certain criteria more than others, for example, was something discussed by the subcommittees. Ultimately three scoring options were developed, as follows:

- Option 1 – Straight Score: all points received added together.
- Option 2- Weighted Score: half of the criteria receive double points and are then added together.
- Option 3- Average Goal Score: a percent score for each of the four goal areas is calculated and then averaged. This option weighted each goal equally

For each of the three options, projects were ranked from top to bottom by score using Microsoft Excel's rank formula. From this rank, a percentile ranking for each project was calculated for each option using Microsoft Excel's percent rank formula. The three percentile rankings for each option were then averaged which resulted in a final ranking.

Performance Ranking

For each of the three options, projects were ranked from top to bottom by score using Microsoft Excel's rank formula. From this rank, a percentile ranking for each project was calculated for each option using Microsoft Excel's percent rank formula. The three percentile rankings for each option were then averaged which resulted in a final ranking. Any changes to the project list (e.g., removing a project from the list) affected the ranking.

Project Selection

MPO staff worked with the Planning and Engineering Subcommittees of the Transportation Technical Committee, as well as the Long-Range Transportation Plan Steering Committee, to develop various methods for selecting projects for inclusion in the final fiscally-constrained list. A first step taken was to separate Iowa DOT projects and DART projects from the local community projects. This was done to acknowledge that the Iowa DOT and DART have different funding sources than local communities. A second step taken was to determine an investment scenario, which included determining which funding sources to consider, any local match requirements, and funding set-asides. As noted in Chapter 3, the MPO ultimately decided to look only at STP funds, assuming a 40 percent federal to 60 percent local match ratio, setting aside at least 40 percent of funds for transit, maintenance, and bridge projects. The final step was to determine a method for including roadway projects in the final constrained and illustrative lists.

Iowa DOT and DART Projects

As noted previously, Iowa DOT and DART projects were separated from the community project list. The Iowa DOT list of projects was then ranked by performance, as described above. Only one of the Iowa DOT's projects fell outside of the cost-feasible list of projects and therefore was deemed illustrative. All other projects were included in the constrained list.

FIGURE E1: PROJECT EVALUATION CRITERIA

ID	EVALUATION CRITERIA	INFO SOURCE
Goal 1: Enhance Multimodal Transportation Options		
1	Project is on an existing or planned transit route and the applicant agrees to coordinate with DART regarding transit needs for the project or the project is a new transit facility	Both
2	Project includes an addition to or improvement of the bicycle network	Application
3	Project enhances multi-modal opportunities within or along a designated node/corridor as defined in The Tomorrow Plan	Both
Goal 2: Transportation infrastructure and services are well-managed and optimize		
4	Project improves or maintains an existing route or intersection	Application
5	Project addresses major maintenance (e.g. bridge repair, transit state of good repair, pavement condition index, trails, etc.)	Map
6	Project is on a corridor with existing congestion (Defined as currently having LOS E or F in peak hours)	Map
7	Project is on a corridor with future congestion (Defined as having LOS E or F during peak hours by 2050 based on the MPO's Travel Demand Model)	Map
Project intends to implement one or more of the following congestion management strategies:		
8	Geometrical improvement	Application
9	Improvements to access management	Application
10	ITS/Signalization improvements	Application
11	Improvements to turning movements	Application
12	Improves parallel facility/contributes to alternative routing	Application
13	Signage/Wayfinding	Application
14	Project is programmed in the 2015 - 2018 TIP	Map
15	Route addresses designated freight impediment	Map
16	Existing traffic volume as defined by AADT	Map
Goal 3: Improve the Region's Environmental Health		
17	Project overlaps an environmental conflict area	Map
18	Project overlaps an environmental challenge area	Map
19	Project contributes to improved water quality and/or habitat (e.g. significant investment in trees, vegetated storm water management strategies, permeable surfaces, etc.)	Application
20	Project promotes air quality improvements (e.g. idle reduction, reduces VMT, EV readiness, etc.)	Application
Goal 4: Further the health, safety, and well-being of all residents in the region.		
21	Project is located in a high-crash area as defined by CMET and the project incorporates traffic calming solutions	Both
22	Project has traffic calming solutions to reduce modal conflict (e.g. traffic signals, grade separation, dedicated lanes, etc.)	Application
23	Project is entirely or partially located within an social justice area	Map
24	Project provides alternative transportation to/from an social justice area	Both
25	Project addresses a critical gap in the regional trail network (Level 1 and 2 trails only)	Map
26	Project promotes safe routes to schools	Map

DART worked with MPO staff to identify which would be in the fiscally-constrained list and which would be in the illustrative list. While some of DART's projects worked well with the project evaluation criteria, many others did not and therefore were not evaluated or ranked.

Community Roadway Projects

The first step in developing the community roadway list with remaining STP funds was to allow each community that submitted projects to identify its top priority for inclusion in the plan, regardless of performance ranking. This ensured that all communities that submitted projects had a least one project in the final plan (note that Mitchellville and Dallas County did not submit projects for consideration).

The second step in developing the community roadway list was to include the highest ranking roadway projects until all capacity was used. The MPO limited eligible projects arterial roadways or higher, per current Federal Functional Classification System status, to ensure the more regionally-significant projects were included. Projects that were not able to be included in the constrained list were placed into the illustrative list.

Bridge, Maintenance, and TAP-Funded Projects

Projects to be funded through the bridge and maintenance set-asides, as well as those funded through TAP funds, are not specifically listed in Mobilizing Tomorrow. Instead, projects will be solicited annually for funding awards during the Transportation Improvement Program development.

Roadway Projects

This section documents the roadway projects identified in Mobilizing Tomorrow. Roadway projects identified include a fiscally-constrained list of projects sponsored MPO member governments, which can be funded through the funding strategy discussed in Chapter 3, as well as fiscally-constrained list of Iowa DOT-sponsored projects that can be funded with Iowa DOT funds identified in Chapter 3. Also included are illustrative roadway projects, which are projects that have been identified but are beyond the fiscal capacity of either the MPO or Iowa DOT to fund given anticipated revenues. Figure E2 summarizes fiscal capacity of projects included in both the MPO member government and Iowa-DOT sponsored fiscally-constrained project lists.

FIGURE E2: FISCAL CAPACITY OF FISCALLY-CONSTRAINED ROADWAY PROJECTS

	2015-2024	2025-2034	2035-2050
MPO Member Government Projects			
Revenue Available (from Figure D7 in Appendix D)	\$182,596,500	\$209,527,500	\$394,866,000
Carryover from previous time period	(\$47,088,000)*	\$565,500	\$4,326,000
Project Costs (from figures E5, E6, and E7)	\$134,943,000	\$205,767,000	\$397,345,000
Balance	\$565,500	\$4,326,000	\$1,847,000
Iowa Department of Transportation Projects			
Revenue Available (from Figure D11 in Appendix D)	\$803,025,000	\$1,003,525,000	\$2,033,080,000
Carryover from previous time period	\$0	\$1,041,000	\$82,719,000
Project Costs (from figures E9, E10, and E11)	\$801,984,000	\$921,847,000	\$1,653,353,000
Balance	\$1,041,000	\$82,719,000	\$462,446,000

* funds already committed for 2015-2018 were deducted from available revenue

FIGURE E3: MAP OF FISCALLY CONSTRAINED MPO MEMBER GOVERNMENT ROADWAY PROJECTS

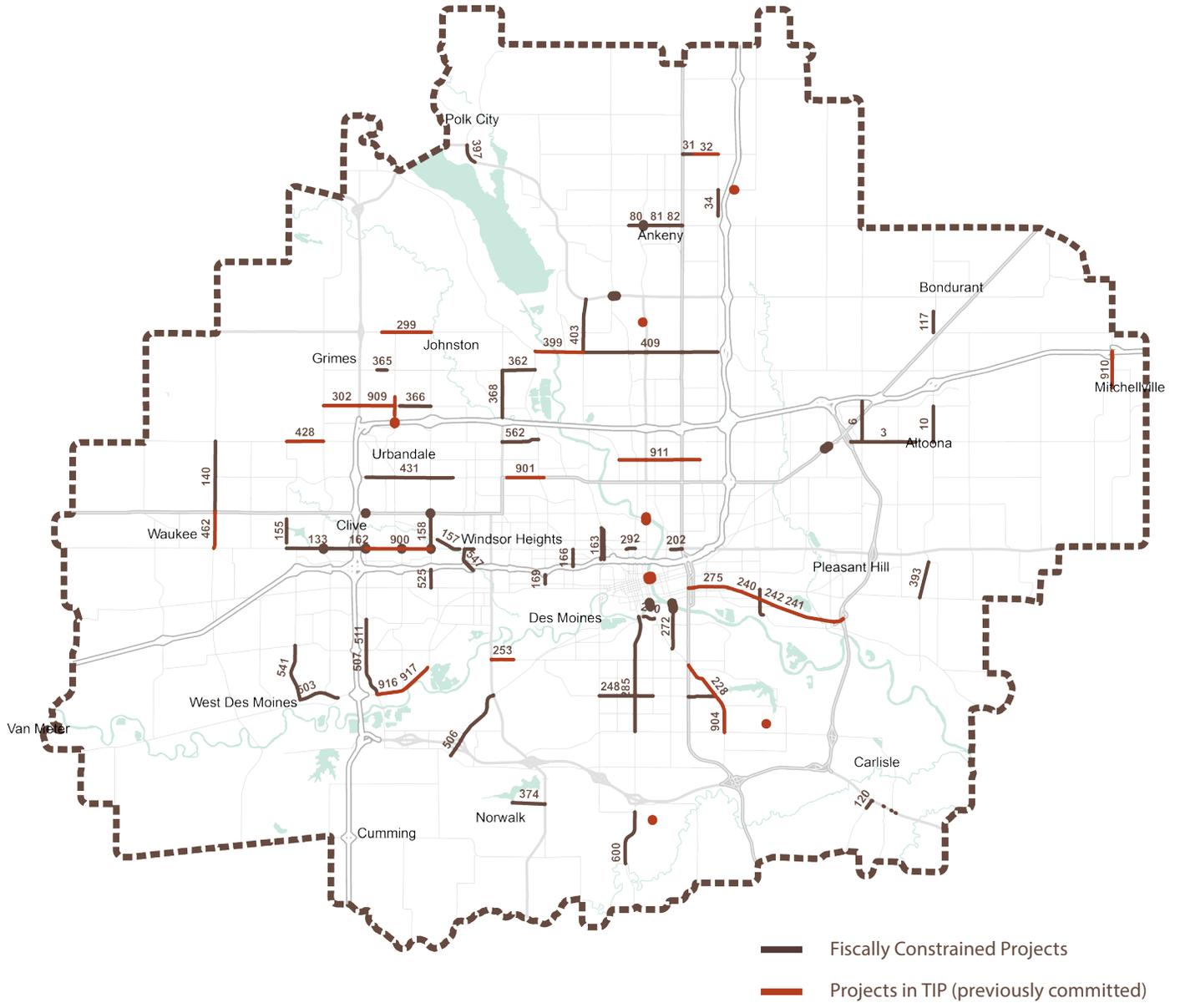


FIGURE E4: PREVIOUSLY COMMITTED MPO MEMBER GOVERNMENT PROJECTS

TPMS ID	L RTP ID	SPONSOR	PROJECT	DESCRIPTION	TERMINI 1	TERMINI 2
22140	900	Clive	University Avenue	Pavement rehab	NW 86th Street	NW 114th Street
27142	164	Des Moines	2nd Ave Bridge Over Des Moines River	Rehabilitation of existing bridge	N of Des Moines River	S of Des Moines River
27144	228	Des Moines	Indianola Widening	Widen street from 2 lanes to 4 lanes	SE 14th St	Army Post Rd
19354	240	Des Moines	SE Connector	New roadway connection	SE 14TH	SE 30TH
17785	253	Des Moines	Park Ave Widening	Widen from 2 to 4 Lanes	SW 63RD ST	SW 56th St
25172	901	Des Moines	E. Douglas Avenue Widening	Pavement widening	E 42nd Street	E 56th Street
29684	902	Des Moines	Locust Street Bridge	Bridge rehab	Over Des Moines River	
18065	903	Des Moines	E. Grand Avenue Bridge	Bridge replacement	Over Des Moines River	
19934	904	Des Moines	E. Indianola Avenue Widening	Grade and pave, right-of-way	SE 16th CT	Army Post Road
26960	905	Des Moines	East Payton Avenue Bridge	Bridge rehab	Over stream	
25372	906	Des Moines	S. Union Street/Clover Hill Drive	Bridge replacement	Over Middle South Creek	
22138	909	Grimes	SE 37th Street Widening	Pavement rehab and widening	IA 141	NW 100th Street
22141	910	Mitchellville	Cotton Avenue	Grade and pave	I-80	Mill Street SW
16690	399	Polk County/Johnston	NW 66 Ave/Kempton Bridge Reconstruction	Reconstruct the street from a rural 2 lane to urban 4-lane roadway with continuous left turn lane; replace existing bridge	NW Beaver Drive	NW 26 Street
20964	911	Polk County	NW Aurora Avenue	Pavement rehab	NW Morningstar Drive	Dixon Street
23639	912	Polk County	NW 72nd Place	Bridge replacement	Over Saylor Creek	
26893	913	Polk County	NE 102nd Avenue	Bridge replacement	Over Fourmile Creek	
25175	428	Urbandale/Grimes	Meredith Drive: 128th Street to 142nd Street	Construct roadway	128th St	142nd St
18070	914	Urbandale	NW 100th Street	Pavement widening	at NW 54th Avenue	
20960	915	Urbandale	100th Street Intersection	Bridge replacement	at I-35/80	
25498	916	West Des Moines	Grand Avenue Widening	Pavement rehab and widening	S 35th Street	S 50th Street
18153	917	West Des Moines	Grand Avenue Widening	Pavement rehab and widening	Raccoon River Park	S 35th Street

FIGURE E5: FISCALLY-CONSTRAINED MPO MEMBER GOVERNMENT ROADWAY PROJECTS - 2015-2024

L RTP ID	SPONSOR	PROJECT	DESCRIPTION	TERMINI 1	TERMINI 2	COST (YOE)
3	Altoona	8th Street SW Reconstruction	Roadway reconstruction	US 65	Venbury Drive	\$22,751,000
27	Ankeny	First St and State St Intersection	Intersection improvements	State Street	1st	\$1,551,000
31	Ankeny	NE 36th Street	Widen to 5-lane roadway	Ankeny Boulevard	NE Trilein	\$3,832,000
32	Ankeny	NE 36th Street	Widen to 5-lane roadway	NE Trilein	NE Delaware	\$3,650,000
51	Ankeny	West First Street	Widen to 5-lane roadway	School	Ankeny Boulevard	\$1,217,000
117	Bondurant	Garfield St. SW Extension	Construct new street	Garfield St./5th St. SW intersection	Garfield St./15th St. SW intersection	\$3,042,000
120	Carlisle	Scotch Ridge Road Intersection Improvements	Add turn lanes and intersection improvements at four intersections	Bellflower Drive	Highway 5	\$1,825,000
133	Clive/West Des Moines	University Avenue Overlay	HMA overlay	NW 114th Street	NW 142nd Street	\$3,042,000
166	Des Moines	31st Widening	Widen From 2 to 3 Lanes	University Ave	I-235	\$1,995,000
197	Des Moines	McKinley Widening	Widen From 2 to 3 Lanes	SE 14th ST	Indianola Ave	\$4,234,000
226	Des Moines/Iowa DOT	Hubbell/NE 46th Intersection Improvements	Add signal and turn lanes	NE 46th ST	Hubbell	\$1,217,000
266	Des Moines	SE 30th Widening	Widen from 2 to 3 Lanes	Scott Ave	Vandalia Rd	\$2,798,000
292	Des Moines	University Widening	Widen from 4 to 5 Lanes	6th Ave	10th Street	\$3,042,000
302	Grimes	SE 37th Street Improvements	Widen rural 2-lane street to 5-lane urban section	HWY 141	S. James Street	\$6,083,000
365	Johnston	NW 62nd Avenue - west of NW 100th Street	Widen from 2 to 5 Lanes	NW 103rd Street	West City Limits	\$3,042,000
366	Johnston/Urbandale	NW 54th Avenue between NW 86th Street and NW 100th Street	Widen from 2 to 4 lanes, rural to urban with pedestrian improvements.	NW 86th Street	NW 100th Street	\$4,867,000
374	Norwalk	Beardsley Reconstruction West	Urbanize and reconstruct, adding turn lanes or additional lanes as needed	IA 28	Lake Colchester Bridge	\$6,083,000
393	Pleasant Hill	Future Roadway Connecting SE 70th to SE 68th	Construction of a future roadway	SE 70th St and Rising Sun Drive	SE 68th St and SE 6th Ave	\$3,163,000
397	Polk City/Iowa DOT	HWY 415 Corridor Improvements	Construction of left and right turn lanes, intersection radii improvements and intersection lighting	Bridge Road	McBride Drive (Saylorville Sandpiper Recreational Area)	\$821,000
403	Polk County	NW 26 Street Reconstruction	Widen the existing 2-lane roadway to 4-lanes with left turn lanes, and preserve existing recreational trail	NW 66 Avenue	Iowa Highway 415	\$10,342,000
431	Urbandale	Douglas Avenue Beautification	Roadway improvements and streetscaping.	I 35/80	62nd Street	\$3,346,000
568	Urbandale	100th Street Interchange	Interchange construction	100th	I-35/80	\$10,646,000

FIGURE E5: FISCALLY-CONSTRAINED MPO MEMBER GOVERNMENT ROADWAY PROJECTS - 2015-2024 (CONTINUED)

L RTP ID	SPONSOR	PROJECT	DESCRIPTION	TERMINI 1	TERMINI 2	COST (YOE)
600	Warren County	County Highway R-63	Add 3 lanes	North River Bridge	Des Moines city limits	\$1,423,000
462	Waukee	Alice's Road Widening	Widen roadway from 2 lanes to 4 lanes with turning lanes.	SE University Avenue	E Hickman Road (HWY 6)	\$17,641,000
502	West Des Moines	S Jordan Creek Widening	Widen 2 lanes to 5 lanes undivided	Mills Civic Parkway	Grand Avenue	\$2,398,000
506	West Des Moines	SW Connector Widen	Widen/Add from 2 lanes to 4 lanes undivided	Iowa 5	Iowa 28	\$6,278,000
511	West Des Moines	50th Street	Widen 2 lanes to 5 lanes undivided	EP True Parkway	Mills Civic Parkway	\$3,762,000
543	Windsor Heights	University Avenue Overlay	Street overlay project	73rd Street	70th Street	\$852,000
Total Project Costs						\$134,943,000

FIGURE E5(A): FISCALLY-CONSTRAINED MPO MEMBER GOVERNMENT ROADWAY PROJECTS - 2015-2024 (AMENDMENT 3)

L RTP ID	SPONSOR	PROJECT	DESCRIPTION	TERMINI 1	TERMINI 2	COST (YOE)
600	Des Moines	Bridges to Opportunity: Des Moines' Community Connection*	The rehabilitation of Court Avenue Bridge, Scott Avenue Bridge, and SW 1st Street Multi-Use Trail Bridge	N/A	N/A	\$14,000,000
601	West Des Moines	Veterans Parkway**	Construction of a new two-lane roadway	IA 5	Grand Prairie Parkway	\$69,900,000
602	West Des Moines	Grand Prairie Parkway***	New road or roadway extension	Veterans Parkway	Wendover Road	\$28,100,000
Total Project Costs						\$112,000,000

* This project is being funded with an \$8 million TIGER grant. The City of Des Moines will cover the remaining costs with local funding. This project also includes the rehabilitation of the Locust Street Bridge (902). The Locust Street Bridge is included in the previously committed projects section.

**This project is being funding entirely with local funding from the City of West Des Moines. It was amended into the plan because the City of West Des Moines is breaking ground in 2017 and the project needs to be reflected in the Model. This is a combination of the following illustrative projects: 448, 449, 450, and 451.

***This project is being funding entirely with local funding from the City of West Des Moines. It was amended into the plan because the City of West Des Moines is breaking ground in 2017 and the project needs to be reflected in the Model. This is a combination of the following illustrative projects: 518, 524, 529, and 530.

FIGURE E6: FISCALLY-CONSTRAINED MPO MEMBER GOVERNMENT ROADWAY PROJECTS - 2025-2034

L RTP ID	SPONSOR	PROJECT	DESCRIPTION	TERMINI 1	TERMINI 2	COST (YOE)
6	Altoona	34th Avenue SW Widening and Realignment	Reconstruct and widen from a 2-lane rural roadway to a 5-lane urban roadway with bike lanes	8th Street SW	I-80	\$16,389,000
10	Altoona	1st Avenue Widening and Reconstruction	Reconstruct portions and widen the roadway to make a 3 lane urban complete street with bike lanes	8th Street SW	9th Street NW	\$8,572,000
34	Ankeny	NE Delaware Avenue	Widen roadway to 5-lane	NE 5th	NE 18th	\$11,346,000
67	Ankeny	SW Oralabor at SW Irvinedale Intersection	Intersection improvements	at SW Irvinedale	SW Irvinedale Dr	\$1,351,000
130	Carlisle	Highway 5 Pedestrian Safety Improvements	Reconfiguration of intersections to roundabouts for the following intersections, Scotch Ridge Road, South 5th Street, South 1st Street, and 165th Place / Garfield	Scotch Ridge Road	First Street	\$1,801,000
140	Clive/Waukee	Alices Road Reconstruction	Widen roadway from 2-lane to 5-lane and add multi-use trail	Hickman Road	Meredith Drive	\$10,806,000
144	Clive/Urbandale	Hickman Road and NW 114th Street Intersection Improvements	Add lanes for dedicated turning movements	Hickman Road	NW 114th Street	\$3,602,000
146	Clive/Urbandale	Hickman Road and NW 86th Street Intersection Improvements	Add lanes for dedicated turning movements	Hickman Road	NW 86th Street	\$3,602,000
148	Clive/West Des Moines	University Avenue and NW 86th Street Intersection Improvements	Add lanes for dedicated turning movements	University Avenue	NW 86th Street	\$4,502,000
149	Clive/West Des Moines	University Avenue and NW 100th Street Intersection Improvements	Add lanes for dedicated turning movements	University Avenue	NW 100th Street	\$4,502,000
150	Clive/West Des Moines	University Avenue and NW 114th Street Intersection Improvements	Add lanes for dedicated turning movements	University Avenue	NW 114th Street	\$4,502,000
151	Clive/West Des Moines	University Avenue and NW 128th Street Intersection Improvements	Add lanes for dedicated turning movements	University Avenue	NW 128th Street	\$4,502,000
169	Des Moines	42nd St Widening	Widen from 2 to 3 Lanes	I-235	Ingersoll	\$1,801,000
202	Des Moines	E University Ave Widening	Widen from 4 to 5 Lanes	E 9th	E 14th	\$3,062,000
241	Des Moines/Pleasant Hill	SE Connector	New 2 lane roadway	SE 30th St	US 65	\$72,038,000
247	Des Moines	McKinley Widening	Widen from 2 to 3 Lanes	S. Union Street	SW 9th	\$8,104,000
299	Johnston	NW 70th Avenue west of NW 86th Street	widen from 2 to 5 lanes with roundabouts, trail and sidewalk	NW 86th Street	West City Limits	\$21,611,000

FIGURE E6: FISCALLY-CONSTRAINED MPO MEMBER GOVERNMENT ROADWAY PROJECTS - 2025-2034 (CONTINUED)

L RTP ID	SPONSOR	PROJECT	DESCRIPTION	TERMINI 1	TERMINI 2	COST (YOE)
368	Johnston	Merle Hay Road - I 35/80 to NW 62nd Avenue	Asphalt overlay project, including intersection/ access management improvements were necessary	I 35/80	NW 62nd Avenue	\$5,403,000
503	West Des Moines	Grand Ave Extension	Add 3 lanes undivided	Raccoon River Drive	Jordan Creek Parkway	\$7,297,000
507	West Des Moines	50th St Widen	Widen 2 lanes to 5 lanes undivided	EP True Parkway	Grand Avenue	\$8,619,000
525	West Des Moines	22nd Street	Widen 2 lanes to 3 lanes undivided	South of I-235	Ashworth Road	\$1,094,000
547	Windsor Heights	73rd Street overlay	Street overlay	University Ave	8th St in West Des Moines	\$1,261,000
Total Project Costs						\$205,767,000

FIGURE E7: FISCALLY-CONSTRAINED MPO MEMBER GOVERNMENT ROADWAY PROJECTS - 2035-2050

L RTP ID	SPONSOR	PROJECT	DESCRIPTION	TERMINI 1	TERMINI 2	COST (YOE)
80	Ankeny	West First Street	Widen from 4 to 5 lanes	Linden	State Street	\$13,329,000
81	Ankeny	West First Street	Widen from 4 to 5 lanes	State Street	Cherry	\$18,661,000
82	Ankeny	West First Street	Widen from 4 to 5 lanes	Cherry	School	\$6,665,000
155	Clive/ Waukee	NW 142nd Street Reconstruction	Widen Street from 2-lane to 3-lane and add multi-use trail	Pinnacle Pointe Drive	Hawthorn Drive	\$6,665,000
156	Clive	NW 86th Street Widening	Widen from 5-lane to 7-lane	University Avenue	University Boulevard	\$5,332,000
157	Clive	University Boulevard Widening	Widen from 3-lane to 5-lane	NW 75th Street	NW 84th Street	\$6,665,000
158	Clive	NW 86th Street HMA Overlay	HMA overlay	University Avenue	Hickman Road	\$2,666,000
162	Clive	University Avenue HMA Overlay	HMA overlay	NW 86th Street	NW 142nd Street	\$13,329,000
163	Des Moines	19th St Widening	Widen 2 to 3 Lanes	Martin Luther King Jr PKWY	I-235	\$17,061,000
230	Des Moines	Indianola Rd Widening	Widen 2 to 3 Lanes	SW 7th	SE 1st	\$5,332,000
239	Des Moines	Martin Luther King Jr PKWY Widening	Widen 2 to 4 Lanes	19th	I-235	\$17,061,000
242	Des Moines/ Pleasant Hill	SE Connector	Widen 2 to 4 Lanes	SE 30th St	US 65	\$37,322,000
248	Des Moines	McKinley Widening	Widen 2 to 3 Lanes	SW 9th	Fleur Drive	\$13,862,000
272	Des Moines	SE 6th Widening	Widen 2 to 3 Lanes	Des Moines River	Indianola Ave	\$21,327,000
273	Des Moines	SE 6th Bridge Over Des Moines River	Rehabilitation of existing bridge	6th Ave	Des Moines River	\$10,930,000
275	Des Moines	SE Connector	Widen from 2 to 4 Lanes	SE 14th	SE 30th	\$34,656,000
281	Des Moines	SW 3rd Bridge Over Raccoon River	Rehabilitation of existing bridge	3rd Street	Raccoon River	\$8,531,000
285	Des Moines	SW 9th Widening	Widen from 4 to 5 Lanes	Raccoon River	Army Post Rd	\$79,975,000
362	Johnston	NW 62nd Avenue - NW Beaver Drive to Merle Hay Road	Reconstruction to urban cross-section with trail and sidewalk	NW Beaver Drive	NW 62nd Avenue	\$10,663,000
409	Polk County	NW/NE 66 Avenue Widening	Reconstruction to urban cross-section with bike lanes	NW 26 Street	NE 22 Street	\$47,985,000
562	Polk County/ Des Moines	NW Meredith Drive Reconstruction	Reconstruction to urban cross-section with bike lanes and sidewalks	Merle Hay Road	Beaver	\$9,330,000
541	West Des Moines	S Jordan Creek Parkway	Widen 2 lanes to 5 lanes undivided	Mills Civic Parkway	Grand Avenue	\$9,998,000
Total Project Costs						\$397,345,000

FIGURE E8: MAP OF FISCALLY CONSTRAINED IOWA DOT ROADWAY PROJECTS

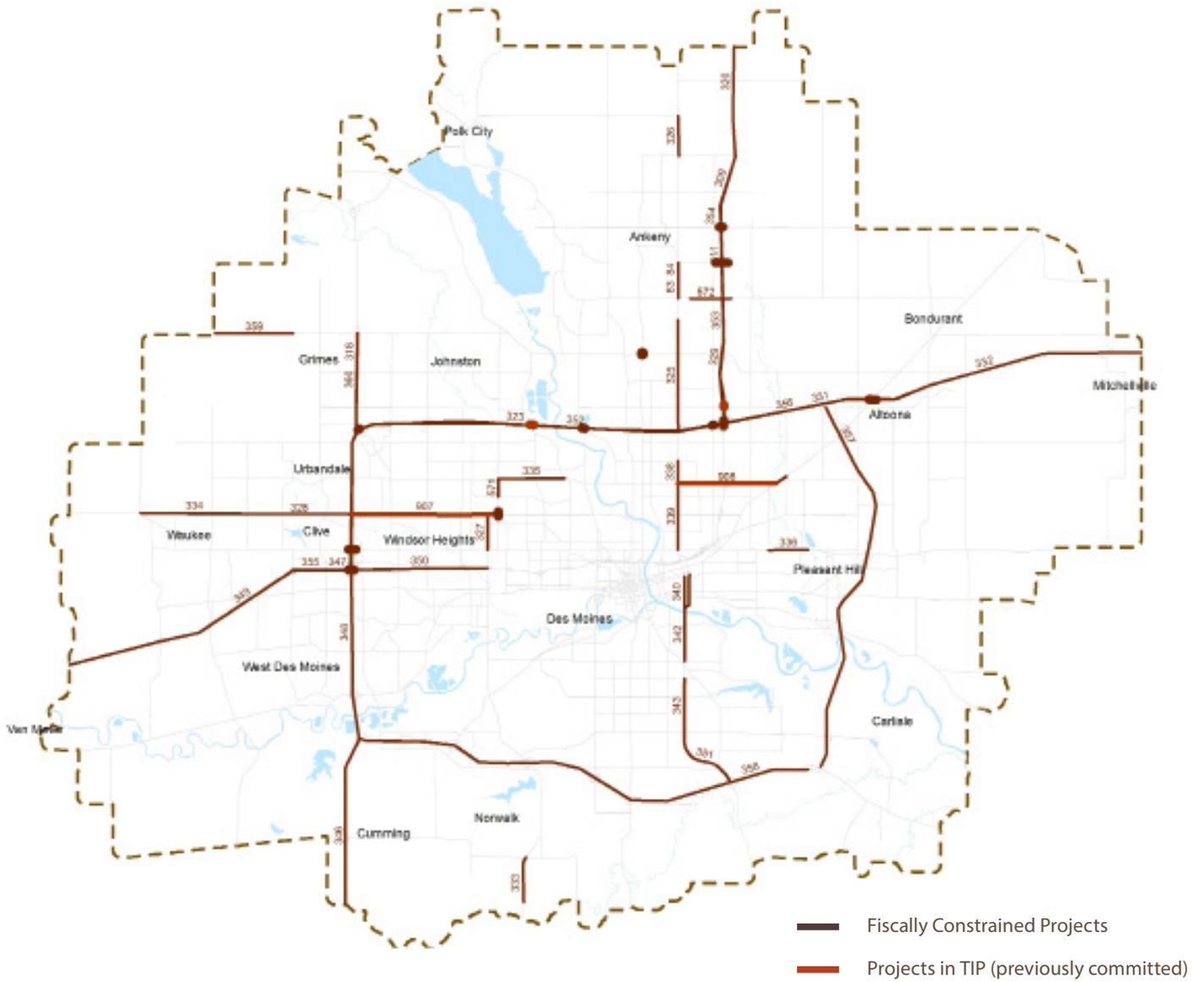


FIGURE E9: FISCALLY-CONSTRAINED IOWA DOT ROADWAY PROJECTS - 2015-2024

L RTP ID	CO-SPONSOR	PROJECT	DESCRIPTION	TERMINI 1	TERMINI 2	COST (YOE)
250	Des Moines	Merle Hay/Hickman Intersection Improvements	Improve turn movements at intersection	Hickman Rd		\$4,867,000
260	Des Moines	SE 14th Widening	Widen from 4 to 5 lanes	Des Moines River	Maury	\$2,433,000
309		I-35 Widening	Widen I-35 from four to six lanes; Replace bridges over Four Mile Creek	First Street, Ankeny	36th Street, Ankeny	\$42,583,000
310	Ankeny	Reconfigure First St. Interchange	Reconfigure First interchange; A diverging diamond design is being developed	I-35 at First St., Ankeny		\$18,250,000
311		I-35 Auxiliary Lanes	Construct an auxiliary lane in both directions to supplement the existing six-lane facility	I-35 interchange at Oralabor Rd.	I-35 interchange at First St.	\$2,433,000
312		NE 54th Ave. bridge over I-35	Replace NE 54th Avenue bridge over I-35.	NE 54th Ave. bridge over I-35		\$6,327,000
313	Polk County	Delaware Avenue Bridge Replacement	Replace Delaware Avenue bridge over I-35/80	Delaware Avenue bridge over I-35/80		\$23,725,000
314	Polk County	Replace Morningstar Bridge over I-35/80	Replace Morningstar Bridge over I-35/80	I-35/80 at Morningstar Dr.		\$5,718,000
315	Polk County	Replace Beaver Dr. Bridge over I-35/80	Replace Beaver Dr. Bridge over I-35/80	I-35/80 at Beaver Drive		\$8,030,000
316		Reconfigure I-35/80 Interchange at IA 141; to include 1/2 diamond at Meredith, and ramps at 100th	Reconfigure I-35/80 Interchange at IA 141; to include 1/2 diamond at Meredith, and ramps at 100th	I-35/80 at IA 141		\$33,300,000
317		Reconfigure I-80 Interchange at E Jct US 65/IA 330	Complete the reconfiguration of interchange	I-80 at E Jct US 65/IA 330		\$10,950,000
318	Grimes	IA 141 Widening	The project will widen the existing divided four-lane facility to six lanes. Intersection improvements.	SE 37th Street, Grimes	IA 44 Interchange	\$9,247,000
319		Reconfiguration of East Mixmaster Interchange	Reconfiguration of the East Mixmaster Interchange	East Mixmaster Interchange		\$72,999,000
322	Clive/Urbandale	Reconfigure I-35/80 interchange at US 6/ Hickman Rd.	Reconfigure the interchange, most likely as a diverging diamond	I-35/80 interchange at US 6/Hickman Rd.		\$12,167,000
323		I-35/80 Widening	Widen from six lanes to eight lanes	West Mixmaster	East Mixmaster	\$200,748,000
324		Reconfigure West Mixmaster	Reconfigure the interchange at the west junction of I-35/80/235	West Jct. of I-35/80/235		\$158,165,000
325	Polk County	US 69 Widening	Widen US 69 from two lanes to five lanes	NE 51st Ave.	SCL Ankeny	\$14,600,000

FIGURE E9: FISCALLY-CONSTRAINED IOWA DOT ROADWAY PROJECTS - 2015-2024 (CONTINUED)

L RTP ID	CO-SPONSOR	PROJECT	DESCRIPTION	TERMINI 1	TERMINI 2	COST (YOE)
327	Des Moines	IA 28 Widening	Widen IA 28/63rd Street from two lanes to four lanes	University Avenue, Des Moines	Hickman Road, Des Moines	\$6,083,000
328	Clive/Urbandale	US 6 Widening	Widen US 6/Hickman Road from four lanes to six lanes	NW 156th Street, Clive & Urbandale	NW 111th Street, Clive & Urbandale	\$18,250,000
331		I-80 Widening	Widen I-80 from six to eight lanes	East Mixmaster	First Street, Altoona	\$57,183,000
332		I-80 Widening	Widen I-80 from four lanes to six lanes	First Street, Altoona	East Urban Area Boundary	\$25,550,000
336	Des Moines	IA 163/E. University Widening	Widen IA 163/E. University Avenue from four lanes to five lanes	E. 33rd Street, Des Moines	ECL Des Moines	\$51,099,000
337	Des Moines	US 6/Hubbell Avenue Widening	Widen US 6/Hubbell Avenue from four lanes to five lanes	Euclid Avenue	E. 38th Street	\$2,190,000
563	Polk County	IA 415/NW 66th Interchange	Replace existing interchange with signalized at-grade intersection	NW 66th Avenue	IA 415	\$8,602,000
571	Des Moines	Merle Hay Widening	Widen from 4 lanes to 5	Douglas	Urbandale	\$3,285,000
572	Ankeny	SE Oralabor Road Operational and Capacity Improvements	Operational and capacity improvements throughout the SE Oralabor Road corridor and at both I-35 exit ramp terminals; Reconfigure intersection at SE Oralabor Road and SE Delaware Avenue; Traffic signal improvements	SE Peachtree Drive	SE Creekside Drive	\$3,200,000
Total Project Costs						\$801,984,000

FIGURE E10: FISCALLY-CONSTRAINED IOWA DOT ROADWAY PROJECTS - 2025-2034

L RTP ID	CO-SPONSOR	PROJECT	DESCRIPTION	TERMINI 1	TERMINI 2	COST (YOE)
68	Ankeny	Oralabor at I-35	Interchange improvements	at I-35		\$54,028,000
83	Ankeny	Ankeny Boulevard SE Oralabor to SE Shurfine	Widening from 4 lanes to 5	SE Oralabor	SE Shurfine	\$7,204,000
84	Ankeny	Ankeny Boulevard SE Shurfine to SE Magazine	Widening from 4 to 5 lanes	SE Shurfine	SE Magazine	\$7,204,000
193	Des Moines	Euclid Ave Widening	Widen from 4 to 5 lanes	Cornell St	E 14th St	\$9,455,000
320		I-35 Widening	The project will widen I-35 from four lanes to six	36th Street Interchange, Ankeny	North Urban Area Boundary	\$72,038,000
321		Completion of reconfiguration I-35/80 Interchange at IA 141; to include C/D system, 1/2 diamond at Meredith, and ramps at 100th	Project will complete the reconfiguration of the interchange that began in the 2015-2020 period	I-35/80 interchange at IA 141		\$31,517,000
326	Ankeny	US 69 Widening	Widen US 69/Ankeny Blvd. from three lanes to five lanes	N. 36th Street, Ankeny	N. 54th Street, Ankeny	\$18,009,000
329		I-35 Widening	Widen I-35 from six lanes to eight lanes	East Mixmaster	First Street, Ankeny	\$50,426,000
330		Complete reconfiguration of the East Mixmaster	Complete reconfiguration of the East Mixmaster	N/E Jct. of I-35/80/235		\$259,336,000
333	Norwalk	Widen IA 28	Widen IA 28 from 2 lanes to four lanes	SCL Norwalk	North Avenue, Norwalk	\$16,208,000
338	Des Moines	US 69/NE 14th Street Widening	Widen US 69/NE 14th Street from four lanes to five lanes	Aurora Avenue	Euclid Avenue	\$6,303,000
339	Des Moines	US 69/NE 14th Street Widening	Widen US 69/NE 14th Street from four lanes to five lanes	Euclid Avenue	University Avenue	\$15,488,000
340	Des Moines	US 69/E. 14th Street One-Way Conversion	Convert US 69/E. 14th Street to a one-way street	Court Avenue	E. 15th Street Extension	\$576,000
341	Des Moines	US 69/SE 15th Street Extension	Extend US 69/SE 15th Street south approximately 1.8 miles; Construct three lanes on new alignment	North of Court Avenue	South of Hartford Avenue	\$117,061,000
342	Des Moines	US 69/SE 14th Street Widening	Widen US 69/SE 14th Street from four lanes to six lanes	South termini of future E 15th Street Extension	Park Avenue	\$5,943,000
343	Des Moines	US 69/SE 14th Street Widening	Widen US 69/SE 14th Street from four lanes to six lanes	Watrous Avenue	E. Army Post Road	\$12,787,000
344		Reconfigure West Mixmaster (W Jct I-35/80/235)	Complete reconfiguration of the West Mixmaster	West Mixmaster (W Jct I-35/80/235)		\$147,677,000
346		I-35 Widening	Widen I-35 from four lanes to six lanes	South Urban Area Boundary	IA 5	\$32,957,000
350		I-235 Widening	Widen I-235 from six lanes to eight lanes	West Mixmaster	63rd Street	\$57,630,000
Total Project Costs						921,847,000

FIGURE E11: FISCALLY-CONSTRAINED IOWA DOT ROADWAY PROJECTS - 2035-2050

L RTP ID	CO-SPONSOR	PROJECT	DESCRIPTION	TERMINI 1	TERMINI 2	COST (YOE)
186	Des Moines	E 14th Widening	Widen 4 to 5 lanes	E Euclid Ave	E University Ave	\$20,100,000
334	Clive/ Urbandale/ Waukee	US 6 Widening	Widen US 6/Hickman Road from four lanes to six lanes	W Jct Co Rd R22	NW 156th Street, Clive	\$45,319,000
335	Des Moines	US 6/Douglas Avenue Widening	Widen US 6/Douglas Avenue from four lanes to five lanes	Merle Hay Road	Lower Beaver Road	\$13,676,000
345	Clive/West Des Moines	Reconfigure I-35/80 Interchange at University Avenue	Reconfigure I-35/80 Interchange at University Avenue	I-35/80 Interchange at University Avenue		\$27,725,000
347		I-80 Widening	Widen I-80 from six lanes to eight lanes	Jordan Creek PKWY	West Mixmaster	\$31,990,000
348		I-35 Widening	Widen I-35 from six lanes to eight lanes	IA 5	West Mixmaster	\$114,631,000
349		I-80 Widening	Widen I-80 from four lanes to six lanes	West Urban Area Boundary	Jordan Creek PKWY	\$95,970,000
351	Des Moines	US 69/SE 14th Street Widening	Widen US 69/SE 14th Street from four lanes to six lanes	E. Army Post Road	US 65/IA 5	\$19,007,000
353		I-35 Widening	Widen I-35 from eight lanes to ten lanes	East Mixmaster	First Street, Ankeny	\$199,938,000
354		I-35 Widening	Widen I-35 from six lanes to eight lanes	First Street, Ankeny	36th Street, Ankeny	\$39,988,000
355		I-80 Widening	Widen I-80 from eight lanes to ten lanes	Jordan Creek PKWY	West Mixmaster	\$53,317,000
356		I-80 Widening	Widen I-80 from eight lanes to ten lanes	East Mixmaster	First Avenue, Altoona	\$119,963,000
357		US 65 Widening	Widen US 65 from four lanes to six lanes	W. Jct IA 5	I-80	\$338,561,000
358		IA 5 Widening	Widen IA 5 from four lanes to six lanes	I-35	W Jct US 65	\$298,574,000
359	Grimes	IA 44 Widening	Widen IA 44 from two lanes to four lanes	West Urban Area Boundary	Begin three-lane section in Grimes	\$165,282,000
360	Grimes	IA 141 Widening	Widen IA 141 from six lanes to eight lanes	I-35/80	IA 44	\$69,312,000
Total Project Costs						\$1,653,353,000

FIGURE E12: MAP OF ILLUSTRATIVE ROADWAY PROJECTS (MPO AND IOWA DOT)

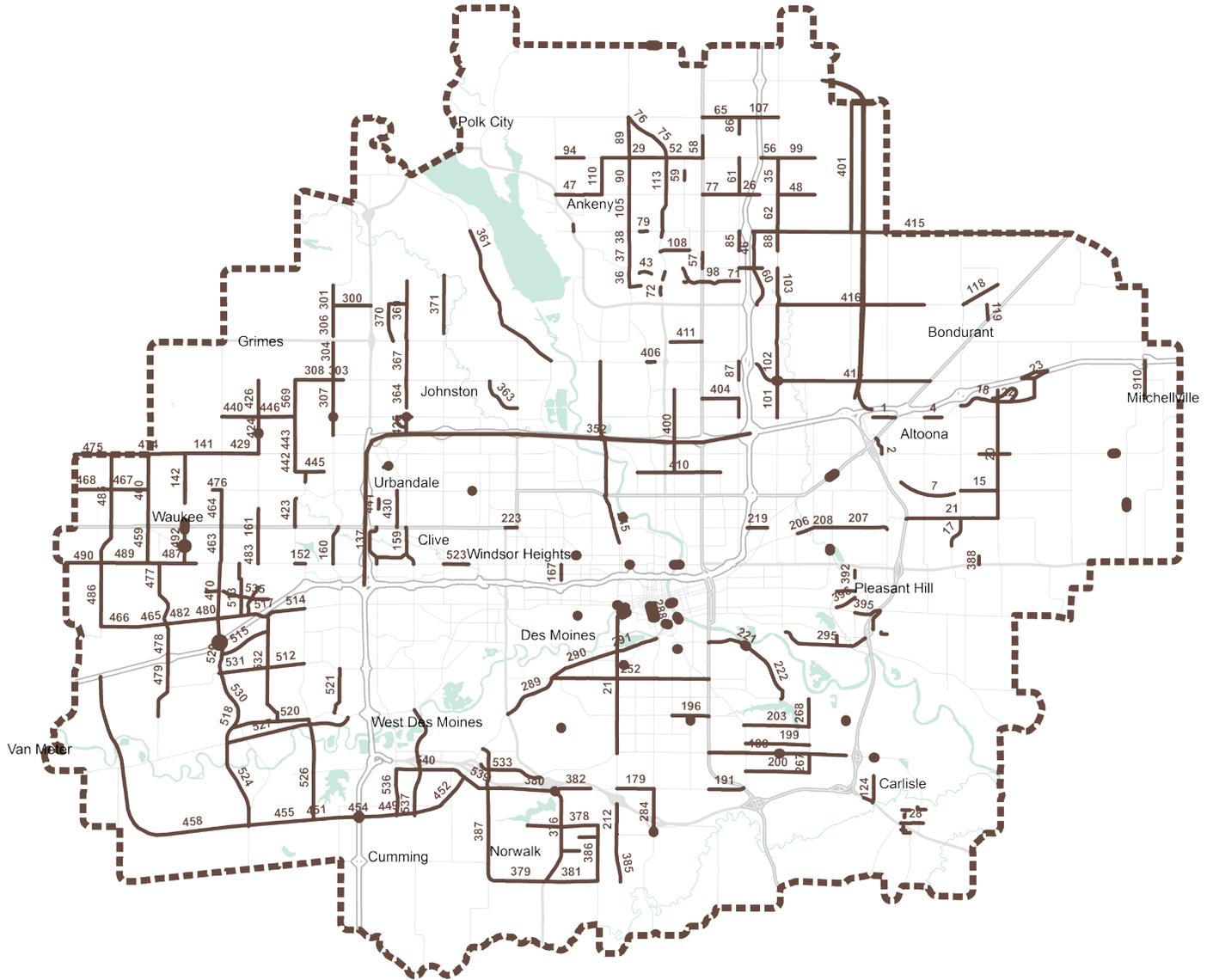


FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
1	Altoona	Adventureland Dr. Wide/Recon	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Water Tower Driveway	Hubbell Avenue	\$5,889,000
2	Altoona	36th Avenue SW Widening and Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	8th Street SW	Hubbell Avenue	\$6,290,000
4	Altoona	Adventureland Dr Widen/Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	17th Avenue NW	9th Avenue NW	\$8,176,000
7	Altoona	24th Street SW Construction	New road or roadway extension	Rutherford Drive SW	3rd Avenue SW	\$26,186,000
14	Altoona	8th Street SE Widening and Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	8th Avenue SE	Mud Creek	\$10,319,000
15	Altoona	24th Street SE / NE 38th Avenue Widening and Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	1st Avenue S	NE 80th Street	\$12,030,000
17	Altoona	1st Avenue S Widening and Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	South Corporate Limits	36th Street SW	\$15,915,000
18	Altoona	Adventureland Drive Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	1st Avenue N	West of Mud Creek	\$8,984,000
19	Altoona	Adventureland Drive Mud Creek Crossing	New road or roadway extension	East end of Adventureland Drive	NE 80th Street	\$12,529,000
20	Altoona	NE 80th Street / 14th Avenue SE Reconstruction and Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE 27th Avenue	I-80	\$62,221,000
21	Altoona	NW 27th Avenue / 36th Street SW/ SE Widening and Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	US 65	NE 80th Street	\$42,973,000
22	Altoona	Adventureland Drive Construction	New road or roadway extension	NE 80th Street	NE 88th Street	\$19,061,000
23	Altoona	I-80 NE 88th Street Interchange	New road or roadway extension	Adventureland Drive extended	1,500 feet north of I-80	\$93,038,000
24	Altoona	NE Area Rail Spur	Rail	IAIS RR	Development Area Northeast of Mud Creek and	\$4,692,000
25	Ankeny	18th	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Abbie	NW Weigel	\$1,825,000
26	Ankeny	NE 18th Street	New road or roadway extension	NE Delaware	NE Frisk	\$7,300,000
29	Ankeny	36th	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	NW Irvinedale	NW Abilene	\$182,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOY)
30	Ankeny	36th	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW Abilene	NW State	\$3,248,000
33	Ankeny	Des Moines Street	New road or roadway extension	SW Prairie Trail Parkway	SW Elm Street	\$6,278,000
35	Ankeny	Four Mile Drive	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	NE 18th	NE 36th	\$608,000
36	Ankeny	SW Irvinedale Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SW Prairie Trail Parkway	SW Vintage	\$5,475,000
37	Ankeny	Irvinedale Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SW Vintage	SW 3rd	\$6,448,000
38	Ankeny	Irvinedale Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SW 3rd	W 1st	\$2,129,000
39	Ankeny	Prairie Trail Parkway/ Shurfine	New road or roadway extension	FFA	SW Des Moines	\$1,460,000
40	Ankeny	Prairie Trail Parkway/ Shurfine	New road or roadway extension	SW Des Moines	SW School	\$1,582,000
41	Ankeny	S Corporate Woods Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Convenience	SE Four Mile	\$7,300,000
42	Ankeny	S Corporate Woods Drive at Four Mile	Intersection	Four Mile	Corporate Woods Drive	\$730,000
43	Ankeny	SW Vintage/Magazine	New road or roadway extension	SW Cascade Falls Drive	SW Linden	\$2,372,000
44	Ankeny	Prairie Trail Parkway/ Shurfine	New road or roadway extension	SW School	Ankeny Boulevard	\$365,000
45	Ankeny	Prairie Trail Parkway/ Shurfine	New road or roadway extension	SW Irvinedale	SW Cascade Falls	\$1,642,000
46	Ankeny	Creekview/ Convenience	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Magazine	E 1st	\$2,190,000
47	Ankeny	NW 18th Street	New road or roadway extension	Polk City Drive	Abbie	\$4,502,000
48	Ankeny	NE 18th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE Four Mile	County NE 38th St	\$5,943,000
49	Ankeny	East First Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Creekview	Frisk	\$1,441,000
50	Ankeny	East First Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Frisk	Four Mile	\$7,564,000
52	Ankeny	NW 36th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW State	NW Ash	\$2,972,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
53	Ankeny	NW 36th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW Ash	Ankeny Blvd	\$2,972,000
54	Ankeny	NW 36th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW Irvinedale	NW Abilene	\$3,152,000
55	Ankeny	NW 36th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW Abilene	NW State	\$2,882,000
56	Ankeny	NE 36th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	I-35	NE FourMile	\$5,043,000
57	Ankeny	Ankeny Boulevard	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Magazine	SE 8th	\$5,043,000
58	Ankeny	Ankeny Boulevard	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE 36th	NE 47th	\$4,502,000
59	Ankeny	NW Ash/Cherry St	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW Georgetown	NW Reinhart (28th)	\$1,441,000
60	Ankeny	Creekview/ Convenience	New road or roadway extension	SE Oralabor	SE Magazine	\$3,782,000
61	Ankeny	Delaware Avenue	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE 18th	NE 36th	\$9,905,000
62	Ankeny	Four Mile Drive	New road or roadway extension	E 1st	NE 18th	\$8,104,000
63	Ankeny	Irvinedale Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	W 1st	NW 5th	\$2,972,000
64	Ankeny	Irvinedale Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW 5th	NW 13th	\$2,972,000
65	Ankeny	NE 54th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Ankeny Boulevard	NE Delaware	\$6,663,000
69	Ankeny	Shurfine	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Ankeny Boulevard	SE Oak	\$900,000
70	Ankeny	SE Shurfine	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Oak	SE Cortina	\$900,000
71	Ankeny	SE Shurfine	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Hulsizer	SE Delaware	\$1,621,000
72	Ankeny	SW State Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SW Plaza Parkway	SW Prairie Trail Parkway	\$1,351,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
73	Ankeny	SW State Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SW Vintage	SW Magazine	\$1,351,000
75	Ankeny	State Street	New road or roadway extension	NW 36th	NW Abilene	\$5,943,000
76	Ankeny	State Street	New road or roadway extension	NW Abilene	NW 54th	\$5,943,000
77	Ankeny	NE 18th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	S Ankeny Blvd	SE Trilein	\$3,242,000
78	Ankeny	18th	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Trilein	SE Delaware	\$3,242,000
79	Ankeny	West First Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Greenwood	Linden	\$6,665,000
85	Ankeny	SE Delaware Avenue	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE 8th	E 1st	\$6,665,000
86	Ankeny	Delaware Avenue	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE 47th	NE 54th	\$7,331,000
87	Ankeny	SE Delaware Avenue	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	South Corp Limit	SE Corporate Woods	\$7,331,000
88	Ankeny	Four Mile Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE 8th	E 1st	\$1,333,000
89	Ankeny	NW Irvinedale Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW 36th	NW 54th	\$2,666,000
90	Ankeny	Irvinedale Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE 18th	NE 36th	\$2,666,000
91	Ankeny	Weigel Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW 18th	NW Reinhart	\$4,665,000
92	Ankeny	Magazine	New road or roadway extension	at I-35		\$106,633,000
93	Ankeny	SE Magazine	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Corp Limit	SE Delaware	\$1,333,000
94	Ankeny	NW 36th Street	New road or roadway extension	NW Plk City	Abbie	\$13,329,000
95	Ankeny	NW 36th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW Weigel	NW Irvinedale	\$9,330,000
96	Ankeny	Shurfine	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Peachtree	SE Hulsizer	\$1,999,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
97	Ankeny	Shurfine	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Cortina	SE Hulsizer	\$1,999,000
98	Ankeny	Shurfine	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	S Ankeny	SE Peachtree	\$1,999,000
99	Ankeny	NE 36th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Four Mile	County 38th Street	\$9,330,000
101	Ankeny	Four Mile Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE 90th	SE Corporate Woods	\$9,330,000
102	Ankeny	Four Mile Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Corporate Woods	SE Oralabor	\$3,999,000
103	Ankeny	SE Four Mile Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Oralabor	SE Magazine	\$1,333,000
104	Ankeny	Highway 415	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	W 1st	NW 5th	\$6,665,000
105	Ankeny	Irvinedale Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW 5th	NW 18th	\$15,995,000
107	Ankeny	NE Delaware to NE Four Mile Drive	New road or roadway extension	NE Delaware	NE Four Mile Drive	\$27,991,000
108	Ankeny	SW Ordnance Road	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SW State	SW Cherry	\$7,998,000
109	Ankeny	Irvinedale Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW 36th	NW 47th	\$9,330,000
110	Ankeny	Weigel Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW Reinhart	NW 36th	\$4,665,000
111	Ankeny	NE 36th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE Four Mile	County NE 38th St	\$15,995,000
112	Ankeny	Irvinedale Drive	New road or roadway extension	NW 47th	NW 54th (NW State)	\$9,330,000
113	Ankeny	NW State Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	E 1st	NE 36th	\$31,990,000
114	Ankeny	SW State Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SW 3rd	W 1st	\$3,999,000
118	Bondurant	Northern East/West Arterial	New road or roadway extension	Pleasant Dr. NE (80th St.)	2nd St. NW	\$27,014,000
119	Bondurant	HWY 65 Access in Northeast Bondurant	New road or roadway extension	HWY 65, 1000 ft. north of Washington St.	2nd St. NE 1,500 ft. west of Pleasant St.	\$9,005,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
122	Carlisle	Gateway Drive and Highway 5 Traffic Signals	Pedestrian (e.g. cross walks, sidewalks , HAWK installations, etc.)	Intersection Only	Intersection Only	\$487,000
123	Carlisle	8th Street and Cole Street Reconstruction	Pedestrian (e.g. cross walks, sidewalks , HAWK installations, etc.)	200' South of HWY 5	Ash Street	\$10,950,000
125	Carlisle	Ash Street Reconstruction	Pedestrian (e.g. cross walks, sidewalks , HAWK installations, etc.)	8th Street	5th Street	\$122,000
126	Carlisle	West Cole Overlay	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	8th Street	Dead End to West	\$608,000
127	Carlisle	52nd Street Connection to Highway 5	New road or roadway extension	Gateway Drive and Norgard Circle Intersection	West to 52nd Street	\$12,000
128	Carlisle	School Street Improvements	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	Lindhardt Road	Rail Road Tracks to the East	\$852,000
129	Carlisle	Stuart Street Overlay	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	5th Street	9th Street	\$973,000
132	Carlisle	SE 64th Avenue (Army Post rd.) and SE 52nd Street Intersection Improvements	Intersection	SE 64th Avenue (Army Post rd.) and SE 52nd Street		\$426,000
134	Clive/ Urbandale	Meredith Drive Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Corporate limit with Urbandale	Alices Road	\$1,621,000
137	Clive	NW 114th Street Improvements	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Clark Street	Hickman Road	\$3,650,000
138	Clive	Clark Street Improvements	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW 100th Street	NW 114th Street	\$2,433,000
141	Clive/ Urbandale	Meredith Drive Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Alices Road	Warrior Lane	\$2,433,000
142	Clive	Warrior Lane Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Douglas Parkway	Meredith Drive	\$5,403,000
152	Clive/West Des Moines	University Avenue Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Jordan Creek Parkway	NW 142nd Street	\$5,403,000
159	Clive	NW 100th Street HMA Overlay	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	University Avenue	Hickman Road	\$1,801,000
160	Clive	NW 128th Street HMA Overlay	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	University Avenue	Hickman Road	\$2,666,000
161	Clive	NW 156th Street HMA Overlay	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	south corporate limit	north corporate limit	\$2,666,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
167	Des Moines	42nd Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Crocker	University	\$7,704,000
177	Des Moines	Casady Dr Over Creek	Bridge			\$900,000
179	Des Moines	County Line Rd Widening	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	Fleur Dr	SW 9th St	\$8,645,000
189	Des Moines	Army Post Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE 14th St	SE 45th St	\$119,536,000
190	Des Moines	E Army Post Rd Bridge	Bridge			\$1,600,000
191	Des Moines	County Line Rd Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE 5th St	US 69/ Southridge Blvd	\$12,967,000
194	Des Moines	E Gray St Bridge Over Crawford Creek	Bridge			\$3,602,000
195	Des Moines	E Hartford Ave Bridge	Bridge			\$1,333,000
196	Des Moines	McKinley Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	S Union St	SE 14th St	\$6,351,000
199	Des Moines	E Payton Ave Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Indianola Ave	SE 36th St	\$21,327,000
200	Des Moines	E Pine Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Indianola Ave	SE 36th St	\$18,634,000
203	Des Moines	Easter Lake Dr Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Indianola Ave	SE 36th St	\$21,327,000
206	Des Moines	Easton Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	E 34th St	Four Mile Creek	\$730,000
207	Des Moines	Easton Blvd Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	E 42nd St	Ne 56th St	\$16,048,000
208	Des Moines	Easton Blvd Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Four Mile Creek	E 42nd St	\$5,403,000
211	Des Moines	Fleur Dr Rebuild	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	Army Post Rd	Martin Luther King Jr Parkway	\$54,028,000
212	Des Moines	Fleur Dr Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	IA 5	Bronze St	\$19,834,000
213	Des Moines	Fleur Dr Bridge Over Raccoon	Bridge			\$47,985,000
214	Des Moines	Forest Ave Bridge Over Closes Creek	Bridge			\$1,333,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
218	Des Moines	Grand Ave Bridge Over MLK Parkway	Bridge			\$2,399,000
219	Des Moines	Guthrie Ave Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	I-235	Hubbell Ave	\$8,531,000
221	Des Moines	Hartford Ave Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE 14th St	SE 22nd St	\$17,301,000
222	Des Moines	Hartford Ave Paving	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE 22nd	Evergreen Ave	\$32,417,000
223	Des Moines/ Iowa DOT	Hickman Rd Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Merle Hay Rd	63rd St	\$7,204,000
224	Des Moines/ Iowa DOT	Hubbell/E 42nd Intersection Improvements	Intersection	E 42nd St		\$1,947,000
234	Des Moines	Jackson St Bridge Over Raccoon River	Bridge	On SW 5th Alignment		\$4,550,000
244	Des Moines	MLK Bridge over Raccoon River	Bridge			\$12,529,000
245	Des Moines	Martin Luther King Jr PKWY Widening Part 2	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	19th St	Euclid Ave	\$51,211,000
252	Des Moines	Park Ave Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	George Flagg PKWY	SE 14th St	\$55,983,000
255	Des Moines	Prospect Rd Bridge Over Closes Creek	Bridge			\$1,333,000
256	Des Moines	Red Bridge Over Des Moines River	Bridge	South of Court	North of MLK	\$3,650,000
267	Des Moines	SE 36th St Paving	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	E Army Post Rd	E Pine Ave	\$6,665,000
268	Des Moines	SE 36th St Extension	New road or roadway extension	E Watrous	Easter Lake Dr	\$33,110,000
269	Des Moines	SE 43rd St Connection	New road or roadway extension	Vandalia Rd	SE Connector	\$5,853,000
270	Des Moines	Se 45th St Bridge over UPRR	Bridge			\$3,999,000
271	Des Moines	SE 5th Bridge over Yeader Creek	Bridge			\$1,333,000
278	Des Moines	St Johns Rd Bridge over ravine	Bridge			\$1,333,000
279	Des Moines	SW 1st Bridge over Raccoon	Bridge	South Of MLK		\$1,314,000
282	Des Moines	SW 42nd Bridge over Frink Creek	Bridge			\$1,333,000
283	Des Moines	SW 8th Viaduct over MLK Parkway	Bridge			\$9,330,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
284	Des Moines	SW 9th Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	County Line Rd	Bronze St	\$10,445,000
286	Des Moines	SW 9th Bridge over Middle South Creek	Bridge			\$9,005,000
288	Des Moines	SW 9th Viaduct over MLK Parkway	Bridge			\$8,264,000
289	Des Moines	SW Connector Part 2	New road or roadway extension	IA 28	Park Ave	\$81,815,000
290	Des Moines	SW Connector Part 3	New road or roadway extension	Park Ave	SW 30th St	\$64,033,000
291	Des Moines	SW Connector Part 1	New road or roadway extension	SW 30th St	W of SW 9th	\$71,324,000
293	Des Moines	University Bridge over Keo Way	Bridge			\$1,600,000
294	Des Moines	University Ave Bridge over UPRR	Bridge			\$10,663,000
295	Des Moines	Vandalia Rd Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	E Watrous Ave	US 65	\$28,551,000
298	Des Moines	Williams St Bridge over Four Mile Creek	Bridge			\$7,204,000
300	Grimes	Beaverbrooke Blvd	New road or roadway extension	HWY 141	N James St	\$5,232,000
301	Grimes	N. James Improvements	New road or roadway extension	NW 13th Street	NW 27th Street	\$3,650,000
303	Grimes	SE 19th Street Improvements	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Jacob Street	S James Street	\$1,825,000
304	Grimes	S. James Improvements	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SW 2nd Street	SW 10th Street	\$3,650,000
305	Grimes	S. James & SE 37th Intersection Improvements	Intersection	S James Street	SE 37th Street	\$1,217,000
306	Grimes	N. James Street Improvements	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW 3rd Street	NW 13th Street	\$7,204,000
307	Grimes	S. James Street Blvd Improvements	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE 10th Street	Grimes South City Limits	\$18,009,000
308	Grimes	SW 19th Street Improvements	New road or roadway extension	S. James Street	County Line Road	\$9,005,000
352	IDOT	I-35/80 Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	West Mixmaster	East Mixmaster	\$0
361	Johnston	NW Beaver Drive - NW 66th Avenue north to City Limits	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	NW 66th Avenue	North City Limits	\$4,867,000
363	Johnston	Pioneer Parkway - Merle Hay Road to NW 62nd Avenue	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Merle Hay Road	Pioneer Parkway	\$2,433,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
364	Johnston	NW 100th Street NW 54th Avenue to NW 62nd Avenue	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	1000 feet north of NW 54th Avenue	NW 62nd Avenue	\$4,867,000
367	Johnston	NW 100th Street NW 62nd Avenue to NW 70th Avenue	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW 62nd Avenue	NW 70th Avenue	\$5,110,000
369	Johnston	NW 100th Street north of NW 70th Avenue	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW 70th Avenue	Camp Dodge Boundary	\$8,104,000
370	Johnston/Grimes	NW 107th Street north of NW 70th Avenue	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW 70th Avenue	NW 78th Avenue	\$5,403,000
371	Johnston	NW 86th Street north of NW 70th Avenue	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	Valley Parkway	Camp Dodge Boundary	\$2,666,000
372	Johnston	NW 78th Avenue west of NW 100th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW 100th Street	NW 107th Street	\$2,666,000
373	Norwalk	Chatham Extension and Intersection Upgrade	New intersection and road extension	Chatham	IA 28	\$6,083,000
376	Norwalk/Iowa DOT	Signal Timing on IA 28	ITS Improvements	Iowa 5	North Avenue	\$1,217,000
377	Norwalk	Colonial Parkway Extension	New road or roadway extension	Eastern end of Colonial Parkway	80th Street	\$9,005,000
378	Norwalk	Beardsley Reconstruction East	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Iowa 28	80th Street	\$9,005,000
379	Norwalk	North Avenue Reconstruction West	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Iowa 28	50th Avenue	\$13,329,000
380	Norwalk	County Line Rd Extension	New road or roadway extension	IA 28	50th Street	\$39,988,000
381	Norwalk	North Avenue Reconstruction East	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Iowa 28	80th Street	\$13,329,000
382	Norwalk	Echo Valley Drive Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Iowa 28	Eastern City Limits	\$13,329,000
383	Norwalk	Echo Valley & Iowa 28 Traffic Signals	Intersection	Echo Valley Drive	Iowa 28	\$666,000
385	Norwalk/Des Moines	Fleur Drive Extension	New road or roadway extension	G14	Blue Street	\$39,988,000
386	Norwalk	80th Street Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Beardsley	North Avenue	\$13,329,000
387	Norwalk	50th Avenue Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	North Avenue	County Line Road	\$26,658,000
388	Pleasant Hill/Iowa DOT	Construction of NE 75th St	New road or roadway extension	Highway 163	1200 ft north	\$3,083,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
389	Pleasant Hill	Roadway connection to SE 55th	New road or roadway extension			\$523,000
390	Pleasant Hill	Reconstruction of S Shadyview Blvd	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE 6th	2900 feet south of SE 6th Ave	\$1,669,000
391	Pleasant Hill	Overlay of Fairview	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	Pleasant Hill Boulevard	West corporate limits of Pleasant Hill	\$505,000
392	Pleasant Hill	Overlay of Pleasant Hill Boulevard	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	Solinda Drive	Maple Drive	\$280,000
395	Pleasant Hill	Reconstruction of Parkridge Avenue	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	Pleasant Hill Boulevard	S Shadyview Boulevard	\$3,962,000
396	Pleasant Hill	Overlay of Oakwood	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	Scott Avenue	Pleasant Hill Boulevard	\$1,037,000
400	Polk County	NE 3rd St Preservation	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE Aurora Ave	NE 60 Ave	\$613,000
401	Polk County	NE 46 St. Preservation	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE 94 Avenue	1/2 Mi. S. of NE 126 Ave.	\$1,174,000
404	Polk County	NE 58 Avenue Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE 14 Street	NE 22 Street	\$6,303,000
405	Polk County	NE 22 Street Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE 54 Avenue	NE 58 Avenue	\$7,204,000
406	Polk County	NW 66 Avenue Relocation	New road or roadway extension	NW 6 Drive	NW 65 Lane	\$7,204,000
407	Polk County	BR 6709 Bridge Replacement	Bridge	Bridge W. of NE 108 St.		\$1,441,000
408	Polk County	BR 649 Bridge Replacement	Bridge	On NW 134 Ave. W. of NE 6 St.		\$1,351,000
410	Polk County	NE Aurora Ave Preservation	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NW Morningstar	Dixon	\$1,738,000
411	Polk County/ Ankeny	NE 70 Avenue Reconstruction	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	HWY 415	HWY 69	\$15,995,000
413	Polk County	BR 6633 Bridge Replacement	Bridge	1/3 Mi. N. of NE 23 Ave.		\$1,999,000
414	Polk County	NE 62 Ave. Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE 29 St.	NE 64 St.	\$53,317,000
415	Polk County	NE 94 Avenue Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE Frisk Drive	HWY 65	\$58,648,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

LRTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
416	Polk County	NE 78 Avenue Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE 29 St.	NE 64 St.	\$47,985,000
700	Polk County	NE Beltway	New road or roadway extension	I-80 at US 65	IA 415	
701	Polk County	North/South Metro Parkway	New road or roadway extension	MLK Jr. Parkway	NW 66th	
423	Urbandale	142nd Street: Hickman Road to Walnut Creek Bridge	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Douglas Blvd	Hickman Rd	\$1,941,000
424	Urbandale	156th Street: Meredith Drive to Waterford Road	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Meredith Dr.	Waterford rd.	\$6,662,000
425	Urbandale	100th Street Extension: Interstate 35/80 Bridge to NW 54th	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	I 35/80	NW 54th Ave	\$2,677,000
426	Urbandale	156th Street: Waterford Road to Meadow Drive	Maintenance to existing road (e.g. overlays, mill-and-overlay, diamond grading, etc.)	Waterford Rd	Meadow Dr	\$578,000
429	Urbandale/ Clive	Meredith Drive: 156th Street to 170th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	156th St	170th St	\$5,156,000
430	Urbandale	104th Street Reconstruction Project	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Hickman Rd	Douglas Ave	\$3,834,000
433	Urbandale	156th Street: Walnut Creek Bridge	Bridge	156th St	156th St.	\$1,801,000
437	Urbandale	Waterford Road to Meadow Drive Expansion	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Waterford Rd	Meadow Dr	\$6,186,000
438	Urbandale/ Clive	Meredith Drive: 170th Street to 184th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	170th St	184th St	\$7,632,000
439	Urbandale	Northpark Drive Extension: 100th Street	New road or roadway extension	100th St	NW 54th Ave	\$3,355,000
440	Urbandale	Waterford Road: 156th Street to 170th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	156th St	170th St	\$6,040,000
441	Urbandale	111th Street Paving	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Justin Dr.		\$1,556,000
442	Urbandale	142nd Street: Aurora Avenue to Meredith Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Aurora Ave.	Meredith Dr	\$3,087,000
443	Urbandale/ Grimes	142nd Street: Meredith Drive to Waterford Road	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Meredith Dr.	Waterford rd.	\$6,174,000
444	Urbandale/ Grimes	142nd Street: Ridgemont Drive to Aurora Avenue	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Ridgemont Dr	Aurora Ave.	\$1,859,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
445	Urbandale/ Grimes	Aurora Avenue: 128th Street to 142nd Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Ridgemont Dr	142nd St.	\$4,699,000
446	Urbandale	Waterford Road: 142nd Street to 156th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	142nd St.	156th St.	\$6,040,000
447	Urbandale	142nd Street: Meredith Drive to Waterford Road	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Meredith Dr.	North Corporate Limits	\$6,174,000
564	Urbandale	Aurora Avenue: 109th Street to the Railroad	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	109th	Railroad Tracks	\$547,000
565	Urbandale	Aurora Avenue Railroad Crossing Replacement near 112th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Aurora Railroad Xing	Aurora Railroad Xing	\$90,000
566	Urbandale/ Johnston/ Grimes	NW 54th Avenue: From 1/2 Mile East of 100th Street to 1/3 Mile West of 100th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	1000' East of 100th Street	1000' West of 100th Street	\$2,289,000
567	Urbandale/ Johnston/ Grimes	100th Street and NW 54th Street Intersection	Intersection	100th Street	NW 54th Street	\$5,019,000
569	Urbandale/ Grimes	142nd Street: Waterford Road to North Corporate Limit	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Waterford Rd	North Corporate Limits	\$3,087,000
570	Urbandale	75th Street and Douglas Avenue: Turn Lanes	Intersection	75th Street	Douglas Avenue	\$798,000
448*	Warren County	Veterans Parkway	Major Collector	IA 5	S 35th Street	\$10,265,000
449*	Warren County	Veterans Parkway	New road or roadway extension	S 35th Street	S 50th Street	\$14,227,000
450*	Warren County	Veterans Parkway	New road or roadway extension	S 50th Street	S 60th Street	\$36,559,000
451*	Warren County	Veterans Parkway	New road or roadway extension	S 60th Street	S 105th Street	\$9,064,000
452	Warren County	Veterans Parkway	New road or roadway extension	IA 5	S 35th Street	\$6,665,000
453	Warren County	Veterans Parkway	New road or roadway extension	S 35th Street	S 50th Street	\$14,396,000
454	Warren County	Veterans Parkway	New road or roadway extension	S 50th Street	S 60th Street	\$15,195,000
455	Warren County	Veterans Parkway	New road or roadway extension	S 60th Street	S 105th Street	\$34,922,000
456	Warren County	Veterans Parkway	Interchange	I-35		\$88,506,000
457	Warren County	Veterans Parkway	Interchange	I-35		\$26,392,000
459	Waukee	10th Street Extension	New road or roadway extension	Hickman Road	University Avenue	\$7,204,000
460	Waukee	10th Street Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Hickman Road	Meredith Drive	\$21,327,000

* These projects were moved into the fiscally constrained project list as part of Amended 3 (see Table E5A on page 220).

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
463	Waukee	Alice's Road Widening Phase 2	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE University Avenue	E Hickman Road (HWY 6)	\$2,701,000
464	Waukee	Alice's Road Widening Phase 3	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	E Hickman Road	Douglas Parkway	\$7,204,000
465	Waukee	Ashworth Road Paving Phase 4	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	R-22/6th Street	U Avenue	\$5,403,000
466	Waukee	Ashworth Road Paving Phase 5	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	U Avenue	T Avenue	\$7,998,000
467	Waukee	Douglas Parkway Expansion	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Warrior Lane	T Avenue	\$7,998,000
468	Waukee	Douglas Parkway Expansion Phase 2	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	T Avenue	S Avenue	\$7,998,000
469	Waukee	Five Way Intersection Improvement	Intersection	Warrior Lane	Ashworth Drive	\$2,190,000
470	Waukee	Grand Prairie Parkway Expansion Phase 1	New road or roadway extension	SE University Avenue	SE Ashworth Road	\$24,333,000
471	Waukee	Grand Prairie Parkway Expansion Phase 2	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE Ashworth Road	Interstate 80	\$5,110,000
472	Waukee	Grand Prairie Parkway Expansion Phase 3	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE University Avenue	SE Ashworth Road	\$3,602,000
473	Waukee/ West Des Moines	Grand Prairie Parkway Interchange	Interchange	Interstate 80	Interstate 80	\$18,006,000
474	Waukee	Meredith Drive Paving	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Alice's Road	T Avenue	\$15,995,000
475	Waukee	Meredith Drive Paving Phase 2	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	T Avenue	S Avenue	\$7,998,000
476	Waukee	NE Douglas Parkway Extension	New road or roadway extension	Alice's Road	NE Westgate Drive	\$2,677,000
477	Waukee	R-22/Ute Avenue Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	University Avenue	Ashworth Road	\$21,327,000
478	Waukee	R-22/Ute Avenue Widening Phase 2	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Ashworth Road	Interstate 80	\$7,204,000
479	Waukee	R-22/Ute Avenue Widening Phase 3	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Interstate 80	south corporate limits	\$13,329,000
480	Waukee	SE Ashworth Road Phase 1	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE LA Grant PKWY	Grand Prairie Parkway	\$4,867,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
481	Waukeke	SE Ashworth Road Phase 2	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Grand Prairie Parkway	SE Waco Place	\$7,204,000
482	Waukeke	SE Ashworth Road Phase 3	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Ute Avenue	SE LA Grant PKWY	\$7,204,000
483	Waukeke	SE Boone Drive Widening	Pedestrian (e.g. cross walks, sidewalks , HAWK installations, etc.)	SE University Avenue	Waukeke North Corporate Limits	\$1,351,000
484	Waukeke	SE Westown PKWY Extension	New road or roadway extension	SE Parkview Crossing Drive	Grand Prairie Parkway	\$3,893,000
485	Waukeke	T Avenue Paving Phase 2	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	University Avenue	Ashworth Road	\$15,995,000
486	Waukeke	T Avenue Paving Phase I	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Meredith Drive	University Avenue	\$23,993,000
487	Waukeke	University Avenue Expansion Phase 1	New road or roadway extension	Warrior Lane	R-22/6th Street	\$11,706,000
488	Waukeke	University Avenue Expansion Phase 2	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	R-22/6th Street	10th Street	\$3,602,000
489	Waukeke	University Avenue Expansion Phase 3	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	10th Street	T Avenue	\$15,995,000
490	Waukeke	University Avenue Expansion Phase 4	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	T Avenue	S Avenue	\$13,329,000
491	Waukeke	University Avenue Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SE LA Grant PKWY	Warrior Lane	\$1,825,000
492	Waukeke	Warrior Lane Widening Phase 1	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	University Avenue	Ashworth Drive	\$2,190,000
493	Waukeke	Warrior Lane Widening Phase 2	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Ashworth Drive	Hickman Road	\$1,095,000
494	Waukeke	Warrior Lane Widening Phase 3	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	NE Douglas Parkway	Meredith Drive	\$3,602,000
495	Waukeke	Warrior Lane/Hickman Road Intersection Improvements	Intersection	Warrior Lane	Hickman Road	\$547,000
458	West Des Moines	Veterans Parkway S 105th to I-80	New road or roadway extension	S 105th Street	I-80	\$180,477,000
504	West Des Moines	Pine Avenue	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SW Connector	S 8th Street	\$794,000
505	West Des Moines	92nd Street Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Chalk Street	Ashworth Road	\$3,683,000

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
508	West Des Moines	88th Street	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	EP True Parkway	Bridgewood Boulevard	\$875,000
509	West Des Moines	Mills Civic Parkway	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Jordan Creek Parkway	81st Street	\$1,440,000
512	West Des Moines	Mills Civic Parkway	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	88th Street	Jordan Creek Parkway	\$4,352,000
513	West Des Moines	98th Street Extension	New road or roadway extension	University Avenue	Ashworth Road	\$9,546,000
514	West Des Moines	Ashworth Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	81st Street	Jordan Creek Parkway	\$2,907,000
515	West Des Moines	EP True Extension	New road or roadway extension	105th Street	88th Street	\$15,307,000
516	West Des Moines	8th St Widen	New road or roadway extension	SW Connector	Pine Avenue	\$2,855,000
517	West Des Moines	Ashworth Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	98th Street	81st Street	\$2,839,000
518*	West Des Moines	105th Street Widening	New road or roadway extension	Booneville Road	Grand Avenue	\$3,410,000
519	West Des Moines	Grand Ave Widening	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	88th Street	Jordan Creek Parkway	\$3,697,000
520	West Des Moines	Grand Ave Extension	New road or roadway extension	105th Street	Jordan Creek Parkway	\$13,571,000
521	West Des Moines	60th St Pave/widen	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Mills Civic Parkway	Grand Avenue	\$8,205,000
523	West Des Moines	University Avenue	New road or roadway extension	22nd Street	8th Street	\$5,902,000
524*	West Des Moines	105th Street	New road or roadway extension	Grand Avenue	SW Bypass	\$12,411,000
526	West Des Moines	S Jordan Creek Parkway	New road or roadway extension	Grand Avenue	SW Bypass	\$17,539,000
527	West Des Moines	Raccoon River Drive	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Grand Avenue	105th Street	\$20,271,000
529*	West Des Moines	105th Street	New road or roadway extension	Wendover Road	Mills Civic Parkway	\$5,184,000
530*	West Des Moines	105th Street	New road or roadway extension	Mills Civic Parkway	Booneville Road	\$7,270,000
531	West Des Moines	Mills Civic Parkway	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	105th Street	88th Street	\$8,642,000
532	West Des Moines	88th St Extension	New road or roadway extension	Ashworth Road	Raccoon River Drive	\$28,555,000

* These projects were moved into the fiscally constrained project list as part of Amended 3 (see Table E5A on page 220).

FIGURE E13: ILLUSTRATIVE MPO MEMBER GOVERNMENT AND IOWA DOT ROADWAY PROJECTS (CONTINUED)

L RTP ID	SPONSOR	PROJECT	TYPE	TERMINI 1	TERMINI 2	COST (YOE)
533	West Des Moines	Pine Ave Paving	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	S 8th Street	Iowa 28	\$9,341,000
534	West Des Moines	8th St Pave/Widen	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	Pine Avenue	County Line Road	\$4,882,000
535	West Des Moines	Westtown Extension	New road or roadway extension	105th Street	88th Street	\$16,258,000
536	West Des Moines	S 42nd Street	New road or roadway extension	Maffitt Lake Road	SW Connector	\$12,198,000
537	West Des Moines	S 35th Street	New road or roadway extension	Grand Avenue	SW Connector	\$29,471,000
538	West Des Moines	Pine Avenue	New road or roadway extension	East of SW Connector	SW 80th Avenue	\$3,244,000
539	West Des Moines	Maffitt Lake Road	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	S 8th Street	SW Connector	\$7,186,000
540	West Des Moines	Maffit Lake Road	Improvement to existing road (e.g. replacement, widening, improve alignment, conversion, etc.)	SW Connector	S 50th Street	\$18,358,000
Total Project Costs						\$3,423,729,000

Transit Projects

This section documents the transit projects identified in Mobilizing Tomorrow, as identified by DART. Both the capital and operating costs are identified for each timeframe of the plan. Transit projects identified include a fiscally-constrained list of projects that can be funded through the funding strategy discussed in Chapter 3, as well as illustrative projects that are beyond DART’s fiscal capacity. Figure E14 summarizes fiscal capacity of projects included in the fiscally-constrained project lists.

FIGURE E14: FISCAL CAPACITY OF FISCALLY-CONSTRAINED TRANSIT PROJECTS

	2015-2024	2025-2034	2035-2050
Capital Projects			
Revenue Available (from Figure D10 in Appendix D)	\$135,484,000	\$177,133,000	\$275,091,000
Carryover from previous time period	\$0	\$2,095,000	\$2,096,000
Project Costs (from figures E15, E16, and E17)	\$133,389,000	\$177,132,000	\$275,092,000
Balance	\$2,095,000	\$2,096,000	\$2,095,000
Operating Projects			
Revenue Available (from Figure D10 in Appendix D)	\$367,666,000	\$538,844,000	\$1,297,308,000
Carryover from previous time period	\$0	\$0	\$1,000
Project Costs (from figures E15, E16, and E17)	\$367,666,000	\$538,843,000	\$1,297,308,000
Balance	\$0	\$1,000	\$1,000

FIGURE D15: FISCALLY-CONSTRAINED TRANSIT PROJECTS, 2015-2024

PROJECT	DESCRIPTION	CAPITAL COST (YOE)	OPERATING COST (YOE)	TOTAL COST (YOE)
Ongoing Costs	Ongoing capital and operating costs (Includes 5 HD buses a year)	\$69,514,000	\$327,245,000	\$396,759,000
Fixed Frequency	Implement DART Forward Service Improvements - Includes Buses	\$14,366,000	\$32,013,000	\$46,379,000
Ingersoll/University BRT	Capital & Operating for Route 60 BRT	\$25,000,000	\$6,320,000	\$31,320,000
Increase Vanpools	Purchase Vans - 2 per year plus replacements	\$1,073,000	\$0	\$1,073,000
P&R Facilities	Construct 3 Park and Ride Facilities - Ankeny, WDM, & Clive/Waukee	\$1,545,000	\$229,000	\$1,774,000
SW 9th BRT	Capital & Operating for SW 9th BRT	\$21,891,000	\$1,859,000	\$23,750,000
Total Project Costs		\$133,389,000	\$367,666,000	\$501,055,000

FIGURE D16: FISCALLY-CONSTRAINED TRANSIT PROJECTS, 2025-2034

PROJECT	DESCRIPTION	CAPITAL COST (YOE)	OPERATING COST (YOE)	TOTAL COST (YOE)
Ongoing Costs	Ongoing capital and operating costs (Includes 5 HD buses a year)	\$93,422,000	\$440,457,000	\$533,879,000
Fixed Frequency	Implement DART Forward Service Improvements - Includes Buses	\$23,000,000	\$71,224,000	\$94,224,000
Ingersoll/University BRT	Operating for Route 60 BRT	\$2,350,000	\$12,851,000	\$15,201,000
P&R Facilities	Maintain 3 P&R Facilities - Ankeny, WDM, & Clive/Waukee	\$0	\$308,000	\$308,000
SW 9th BRT	Capital & Operating for SW 9th BRT	\$2,749,000	\$7,535,000	\$10,284,000
6th Ave. BRT	Capital & Operating for 6th Ave. BRT	\$11,535,000	\$2,807,000	\$14,342,000
MLK BRT	Capital & Operating for MLK BRT	\$44,076,000	\$3,661,000	\$47,737,000
Total Project Costs		\$177,132,000	\$538,843,000	\$715,975,000

FIGURE D17: FISCALLY-CONSTRAINED TRANSIT PROJECTS, 2035-2050

PROJECT	DESCRIPTION	CAPITAL COST (YOE)	OPERATING COST (YOE)	TOTAL COST (YOE)
Ongoing Costs	Ongoing capital and operating costs (Includes 5 HD buses a year)	\$220,755,000	\$1,039,629,000	\$1,260,384,000
Fixed Frequency	Implement DART Forward Service Improvements - Includes Buses	\$36,824,000	\$168,298,000	\$205,122,000
Ingersoll/University BRT	Maintenance & Operating for Route 60 BRT	\$3,763,000	\$30,367,000	\$34,130,000
P&R Facilities	Maintain 3 P&R Facilities - Ankeny, WDM, & Clive/Waukee	\$647,000	\$727,000	\$1,374,000
SW 9th BRT	Operating for Route SW 9th BRT	\$4,402,000	\$22,168,000	\$26,570,000
6th Ave. BRT	Operating for 6th Ave. BRT	\$8,701,000	\$10,021,000	\$18,722,000
MLK BRT	Operating for MLK BRT	\$0	\$26,098,000	\$26,098,000
Total Project Costs		\$275,092,000	\$1,297,308,000	\$1,572,400,000

FIGURE D18: PROPOSED BUS RAPID TRANSIT ROUTES

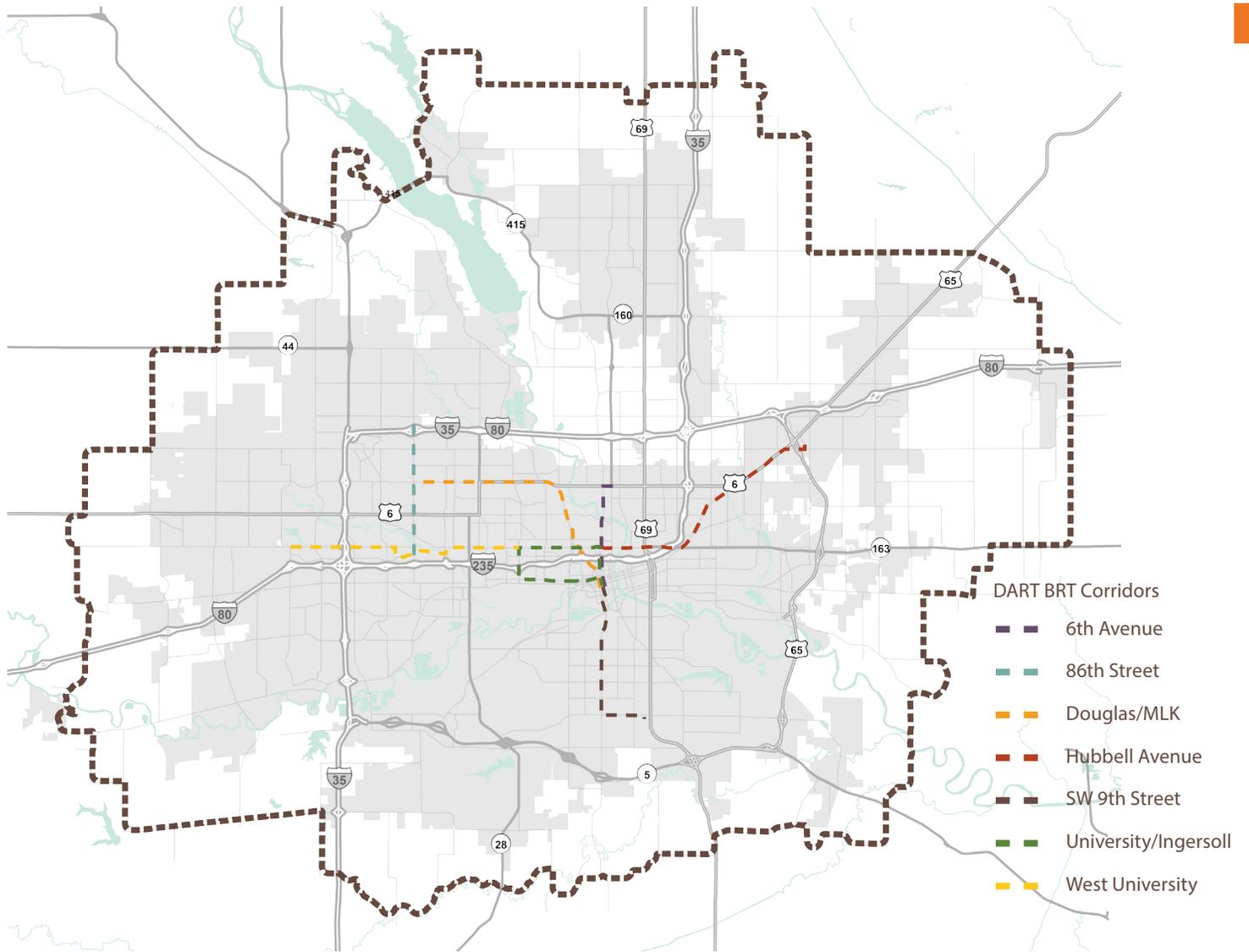
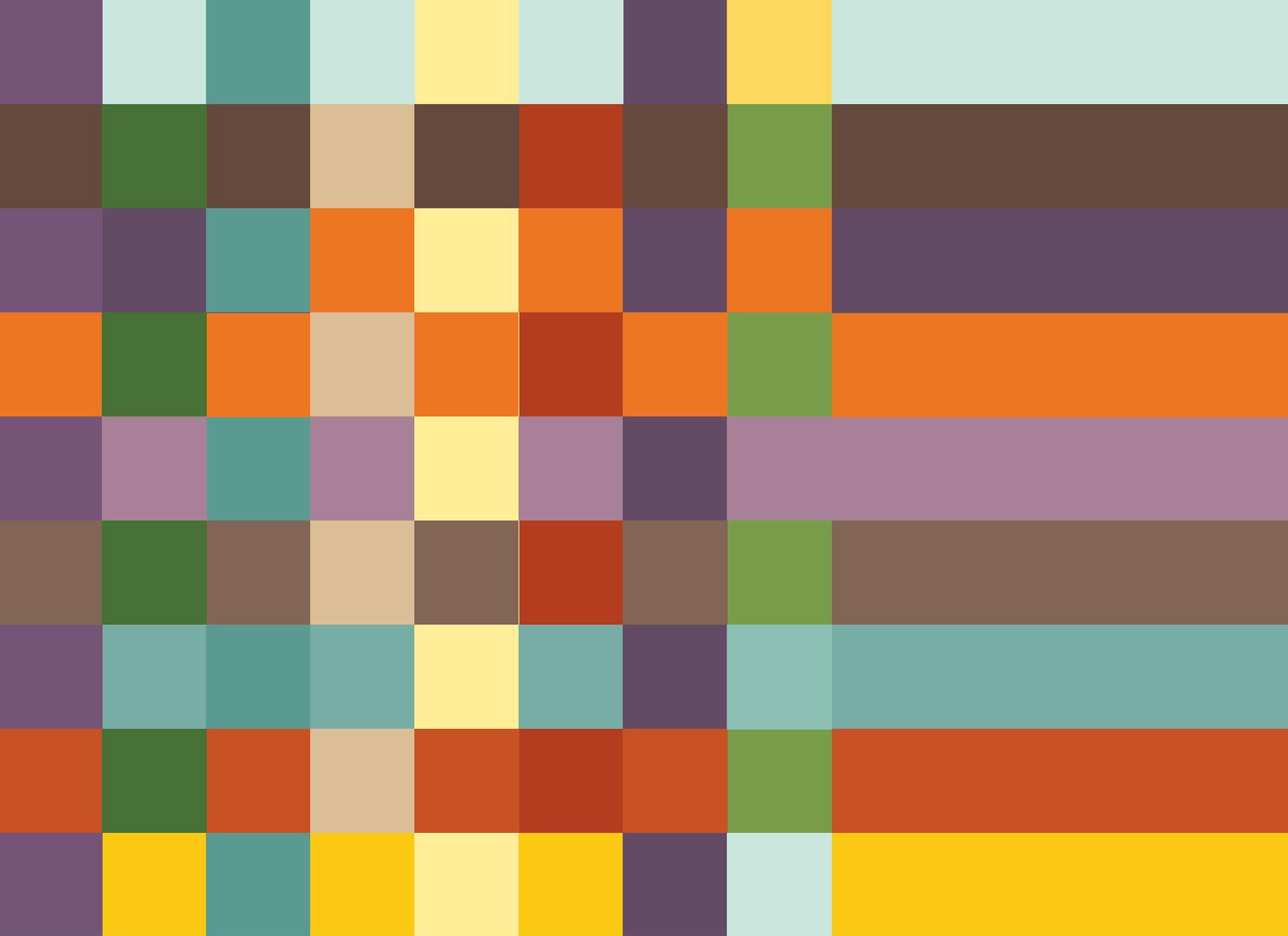


FIGURE D19: ILLUSTRATIVE TRANSIT PROJECTS

PROJECT	DESCRIPTION	CAPITAL COST (YOE)	OPERATING COST (YOE)	TOTAL COST (YOE)
2015-2024 Illustrative Projects				
Fleet Replacement	Additional replacement buses to maintain 6 year average	\$21,726,000	\$0	\$21,726,000
Shelters	One shelter per mile of service	\$808,000	\$287,000	\$1,095,000
Rehab Facility	Rehabilitate existing DART facility	\$5,732,000	\$0	\$5,732,000
Total Project Costs		\$275,092,000	\$1,297,308,000	\$1,572,400,000
2025-2034 Illustrative Projects				
Fleet Replacement	Replace 40 buses to maintain 6 year average	\$32,110,000	\$0	\$32,110,000
Shelters	One shelter per mile of service	\$1,086,000	\$385,000	\$1,471,000
Rehab Facility	Rehabilitate existing DART facility	\$7,703,000	\$0	\$7,703,000
Increase Vanpools	Purchase Vans - 2 per year plus replacements	\$3,451,000	\$0	\$3,451,000
Total Project Costs		\$44,351,000	\$385,000	\$44,736,000
2035-2050 Illustrative Projects				
Fleet Replacement	Replace 64 buses to maintain 6 year average	\$86,190,000	\$0	\$86,190,000
Shelters	One shelter per mile of service	\$409,000	\$909,000	\$1,318,000
Operating Facility	Construct new operating facility	\$70,347,000	\$0	\$70,347,000
Increase Vanpools	Purchase Vans - 2 per year	\$13,382,000	\$0	\$13,382,000
Hubbell BRT	Capital & Operating for Hubbell BRT	\$31,005,000	\$14,701,000	\$45,706,000
University Crosstown BRT	Capital & Operating for University BRT	\$53,915,000	\$15,120,000	\$69,035,000
86th Street BRT	Capital & Operating for 86th BRT	\$37,501,000	\$4,330,000	\$41,831,000
Total Project Costs		\$292,749,000	\$35,060,000	\$327,809,000





APPENDIX F: ENVIRONMENTAL ANALYSIS

ENVIRONMENTAL ANALYSIS

The Des Moines Area MPO has established a regional goal to preserve, to protect, and to enhance the natural and the human environments. This appendix provides an overview of the environmental review conducted for projects in the plan. The assessment takes into consideration the social, the natural, and the human environments, assists in streamlining the federal project review process, and identifies potential environmental mitigation strategies. This environmental review is to conduct an early, cursory analysis of the Mobilizing Tomorrow's planned transportation capital improvements to the natural, human, and social environments to make early project decisions and to increase awareness of subsequent project-level environmental analyses that may be required.

Federal Requirements

The environmental streamlining of transportation planning review is intended to provide a mechanism which allows information, analyses, and products from long-range transportation planning efforts to be incorporated into and formally adopted in SAFETEA-LU and National Environmental Policy Act (NEPA) documents.

It is FHWA's policy that (23 CFR § 771.105):

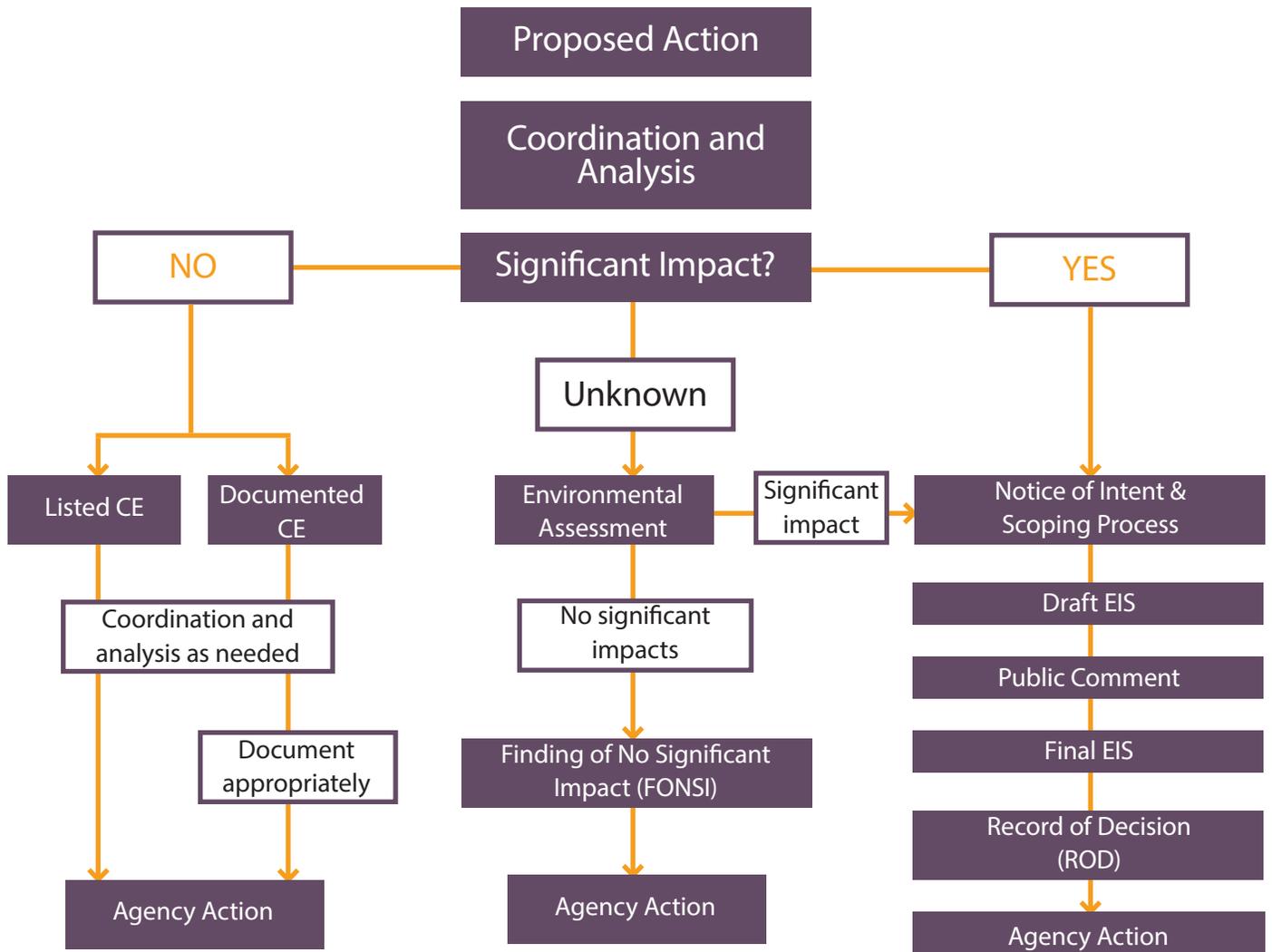
To the fullest extent possible, all environmental investigations, reviews, and consultations be coordinated as a single process, and compliance with all applicable environmental requirements be reflected in the environmental document required by this regulation.

- Alternative courses of action be evaluated and decisions be made in the best overall public interest based upon a balanced consideration of the need for safe and efficient transportation; of the social, economic, and environmental impacts of the proposed transportation improvement; and of national, state, and local environmental protection goals.
- Public involvement and a systematic interdisciplinary approach be essential parts of the development process for proposed actions.
- Measures necessary to mitigate adverse impacts be incorporated into the action.

In addition, federal guidance notes an MPO's MTP should include a discussion of potential environmental mitigation activities. 23 CFR 450 defines environmental mitigation activities as:

"... strategies, policies, programs, actions, and activities that, over time, will serve to avoid, minimize, or compensate for (by replacing or providing substitute resources) the impacts to or disruption of elements of the human and natural environment, which includes, for example, neighborhoods and communities, homes and businesses, cultural resources, parks and recreation areas, wetlands and water sources, forested and other natural areas, agricultural areas, endangered and threatened species, and the ambient air."

NEPA PROCESS FROM CENTER FOR ENVIRONMENTAL EXCELLENCE



Environmental Review

The Mobilizing Tomorrow environmental review consisted of assessing the impacts of each of the MTP’s planned transportation projects on the natural and on the human environment. The Des Moines Area MPO established an on-line natural areas map to analyze the potential effects. The purpose of the Des Moines Area MPO’s review is to assist in streamlining the NEPA process by identifying planned transportation capital improvements’ potential effects on the environment within the early phases of the transportation planning process. This analysis is not intended to substitute for the development of a CE, an EA, or an EIS, but rather to supplement the NEPA process.

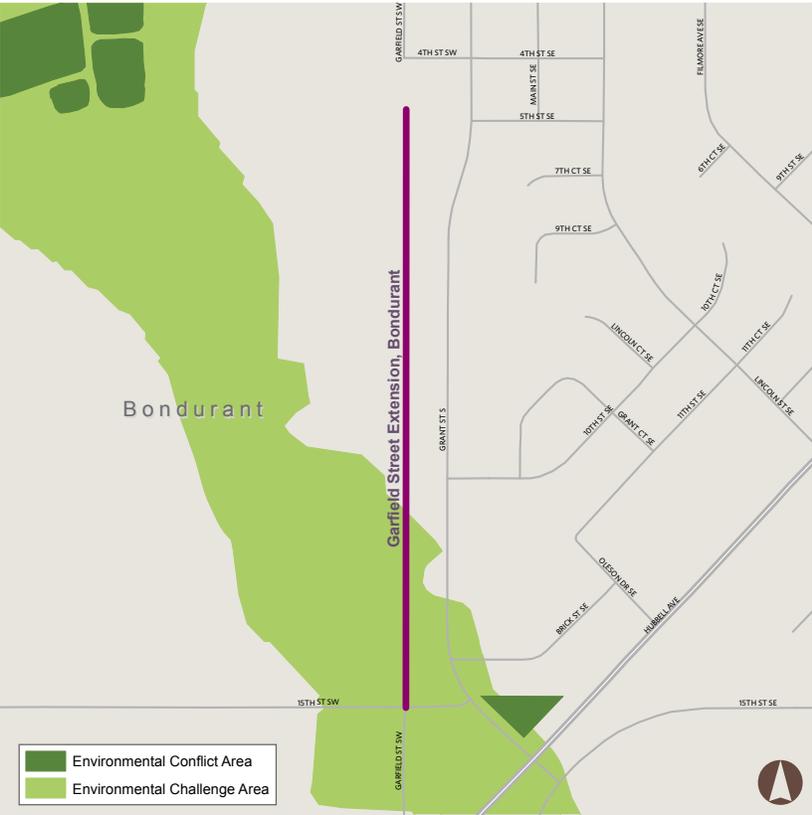
The Des Moines Area MPO utilized the natural areas map, discussed in Chapter 2, to analyze the impact of planned transportation capital improvements and was used in the scoring of proposed projects. This inventory included:

- Threatened and endangered species
- Parks, conservation land and trails
- Streams
- Hydric soils
- Wetlands
- Large, medium and small habitat blocks
- Remnant prairies
- Contaminated site facilities
- Floodplains
- Floodways

Transportation Impacts

The Des Moines Area MPO analyzed the planned improvements’ proximity to elements of the natural areas maps and docked points to those that were likely to affect one or more of these elements. Only five projects in the final approved list of projects have any areas of concerns for impacting natural resources. Staff of the MPO will monitor these projects and continue to seek solutions to avoid impacting the natural resources. The five projects include:

PROJECT ID	SPONSOR	DESCRIPTION
117	City of Bondurant	Garfield Street Extension
241	City of Des Moines	Add two lanes (SE Connector)
393	City of Pleasant Hill	Connection between NE 70th and SE 68th
503	City of West Des Moines	Grand Avenue Extension
341	Iowa DOT	15th Street Extension (US 69)



PROJECT ID: 117
CITY OF BONDURANT

NATURAL AREA IMPEDIMENTS

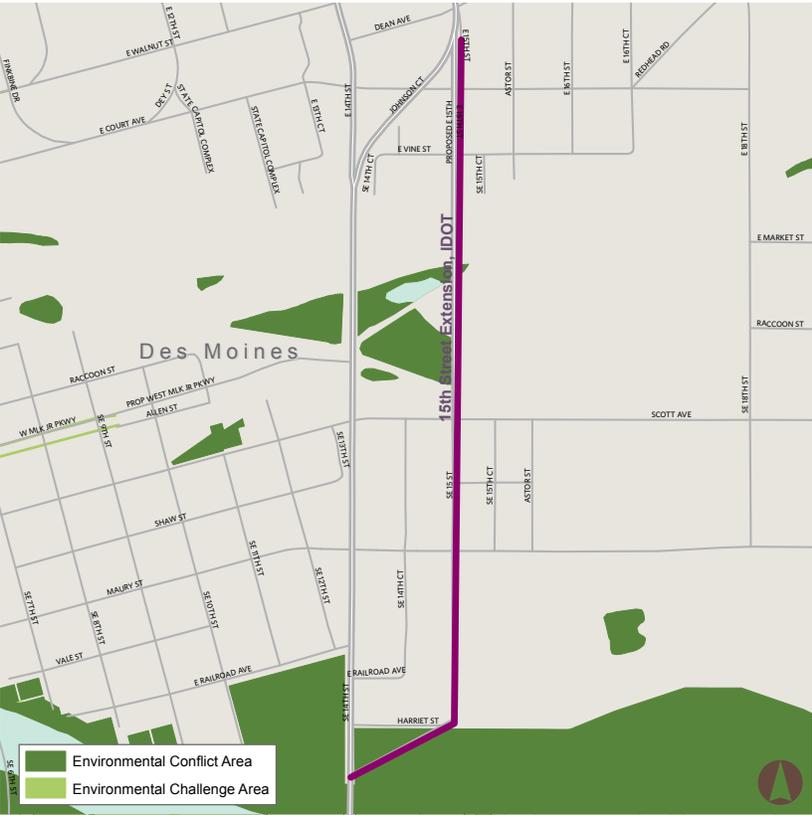
- Hydic Soils
- Floodplain



PROJECT ID: 241
CITY OF DES MOINES

NATURAL AREA IMPEDIMENTS

- Wetlands
- Hydic Soils
- Floodplain



PROJECT ID: 503
IOWA DOT

NATURAL AREA IMPEDIMENTS
Parks and Conservation Land
Wetlands

Mitigation Strategies

Environmental mitigation refers to the strategies developed to actively avoid, minimize, or mitigate the potential impacts a transportation improvement may have on the natural and human environment.

Potential mitigation strategies will/shall include at least one of the following strategies:

- Avoiding impacts
- Minimizing a proposed activity/improvement size or its involvement
- Rectifying impacts (restoring temporary impacts)
- Taking precautionary and/or abatement measures to reduce construction impacts
- Employing special features or operational management measures to reduce impacts
- Compensating for environmental impacts by providing suitable, replacement or substitute environmental resources of equivalent or greater value, on or off-site

Interagency Consultation

The Des Moines Area MPO established the Environment Roundtable to support the review of environmental impacts of transportation projects. Members consist of representatives from the following agencies:

- Capital Crossroads – Environmental Capital
- Center on Sustainable Communities
- Central Iowa Sierra Club and Des Moines Area Audubon
- Department of Natural Resources
- Des Moines Area Community College
- Des Moines Izaak Walton League of America
- Des Moines Park and Recreation
- Des Moines Water Works
- Drake University
- Environmental Law and Policy Center
- Growing Green Communities
- Iowa Audubon
- Iowa Clean Cities Coalition
- Iowa Department of Public Health
- Iowa Economic Development Authority
- Iowa Energy Office
- Iowa Interfaith Power and Light
- Iowa Floodplain and Stormwater Management Association
- Iowa Natural Heritage Foundation
- Iowa Rivers Revival
- Madison County Conservation
- Metro Waste Authority
- Pleasant Hill Park and Recreation
- Polk County Conservation
- Polk Soil and Water Conservation District
- Trees Forever

Environmental Justice (EJ) Review

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations (1994) was enacted to reinforce Title VI of the Civil Rights Act of 1964. Executive Order 12898 states that:

“Each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”

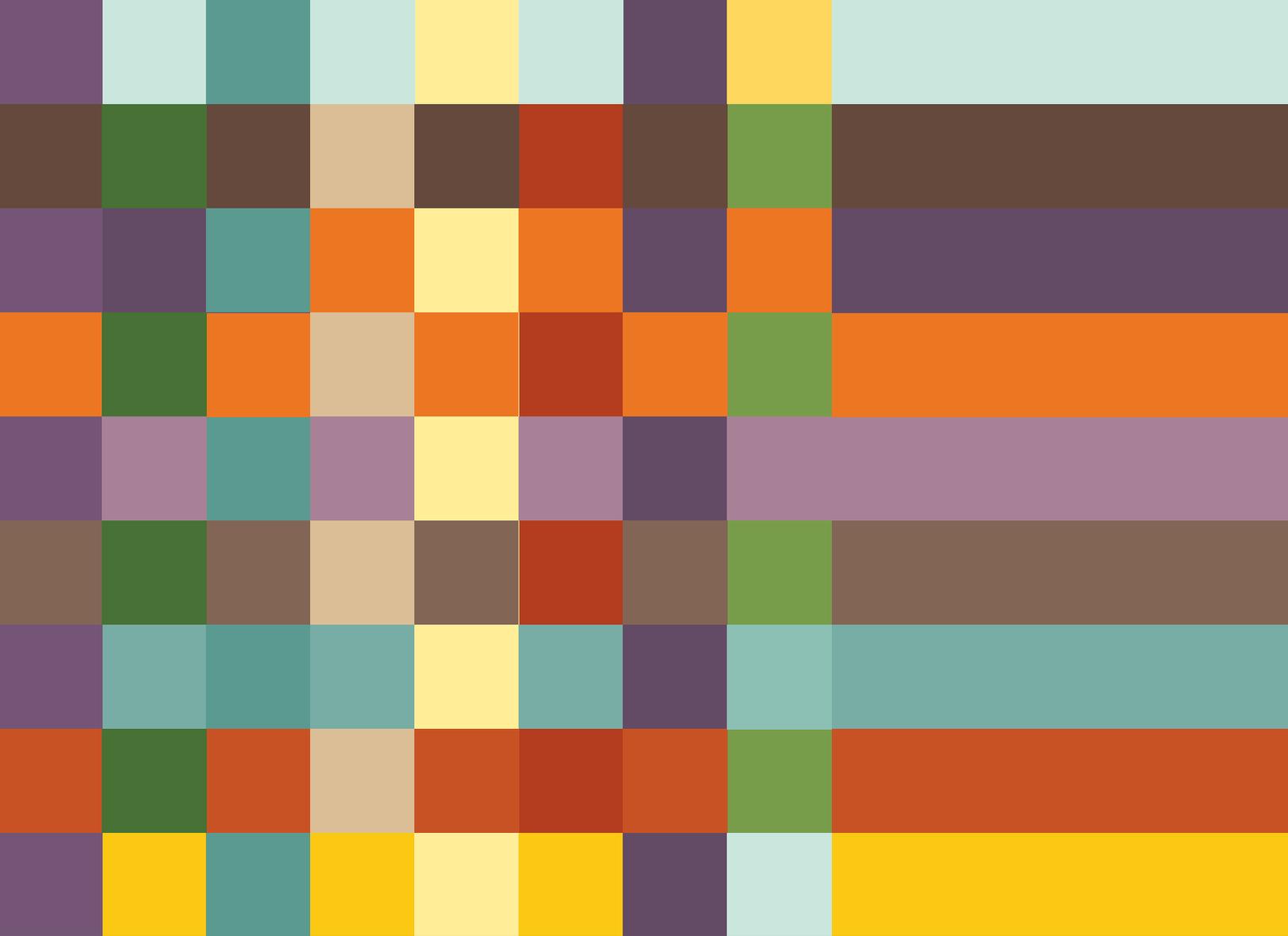
As part of its environmental justice analysis, the Des Moines Area MPO identified seven degrees of disadvantage, or types of traditionally disadvantaged populations, as the analytic basis for ensuring compliance with Title VI. This analysis was utilized to evaluate the impacts of planned transportation projects in areas with socially disadvantaged populations. The seven degrees of disadvantage include:

- Linguistically Isolated
- Non-white Population
- Persons in Poverty
- Carless Households
- Single heads of households
- Persons over 65
- Persons with a disability

Using U.S. Census data at the census tract level, regional averages were determined for each of the seven degrees. A census tract was marked as disadvantaged for each degree if it exceeded the regional average. For example, the regional average for Persons in Poverty sits at 10.7 percent. Any census tract that had an average above 10.7 percent would be considered disadvantaged for that degree. To determine environmental justice areas, all seven degrees were combined to total the number of degrees of disadvantaged in each census tract. Any census tract with six or more disadvantaged degrees was identified as an Environmental Justice (EJ) Area. In the MPO planning area, 4 percent of the land is considered to be an EJ Area, with 15 percent of the population residing in these areas.

Transportation Impacts

The Des Moines Area MPO analyzed the planned transportation projects' proximity to the environmental justice areas. A complete look at each approved project and its proximity to an EJ area can be found on the MPO's website "Measures on the Map" on-line tool.





APPENDIX G: PUBLIC COMMENT

PUBLIC COMMENT

This appendix summarizes efforts undertaken by the MPO to gather public comment on Mobilizing Tomorrow as well as the feedback that was received. The MPO solicited comments at three intervals of the planning process. Public comment collected during development of The Tomorrow Plan also was considered.

The Tomorrow Plan Insights

In 2012, the planning team for The Tomorrow Plan conducted a statistically-representative survey of Greater Des Moines. The survey asked respondents to rank certain types of projects they would like to see in the region. The following list ranks the projects by importance, with 1 being the most important and 14 being the least important; transportation projects are in bold.

1. Lower taxes
2. Increase school funding
3. Redevelop vacant properties
4. Enhance the stormwater system
5. Improve the public transportation system
6. Spend money to attract new businesses
7. Support local placemaking
8. Create new parks and conservation areas
9. Create new bicycle paths and facilities
10. Buy out floodplain properties and convert to open space
11. Expand the trail network
12. Build a major regional attraction downtown
13. Add more parking
14. Build more roads

Outreach Series 1

The MPO hosted the first public outreach series in March 2014. The focus of the first outreach series was to collect general information from residents about their opinions of the transportation system as well as how the MPO should allocate funds. MPO staff hosted three public open houses, the dates and locations of which can be seen on the following page. Comments were solicited in three activities, and each activity was available at the open houses as well as online. The first activity was a survey that asked three questions. Below is a summary of the questions and responses to those questions. The survey was completed by 89 people.

FIGURE G1: OUTREACH SERIES 1 SURVEY RESULTS

QUESTION	RESPONSE
Please rank the following statements from 1 to 5, with 1 being strongly disagree and 5 being strongly agree.	Average Rank
It takes me a consistent amount of time to get to and from work each day.	4.08
The roadway system is kept in good repair (i.e., pavement and bridge conditions).	3.14
I'm, able to safely get to important destinations via bicycle.	2.86
I'm able to comfortably walk to important destinations.	2.78
The public transit system accommodates my needs.	2.26
What percentage of its funds should the MPO allocate to the following?	Percent of Funds (Responses Averaged)
Maintain existing roads and bridges.	47.75
Enhance public transportation.	34.72
Support pedestrian and on-street bicycle facilities.	30.00
Build new roads and bridges.	27.75
Expand the recreational trail system.	25.06
What is most important to you in making improvements to the transportation system?	Percent of Responses
Maintaining a state of good repair.	30.56
Being able to use different kinds of transportation.	26.85
Accessing important destinations.	17.59
Spurring economic development.	14.81
Protecting the environment.	10.19

MOBILIZING TOMORROW

What's great about transportation in Greater Des Moines? What can we do better?

The Des Moines Area Metropolitan Planning Organization (MPO) is developing its next long-range transportation plan and wants to hear from you. Share your thoughts on the transportation system and let us know what's most important to you when we're making improvements to the system. Whether it's access, easing congestion, protecting the environment, or something else, we need your input.

Join us at one of our open houses to help us identify problem areas as well as areas that can serve as models for the rest of the region. We want to hear how you think we should allocate our funds, too.

www.dmampo.org



Join the
discussion!

YMCA Healthy
Living Center
12493 University Avenue
Clive

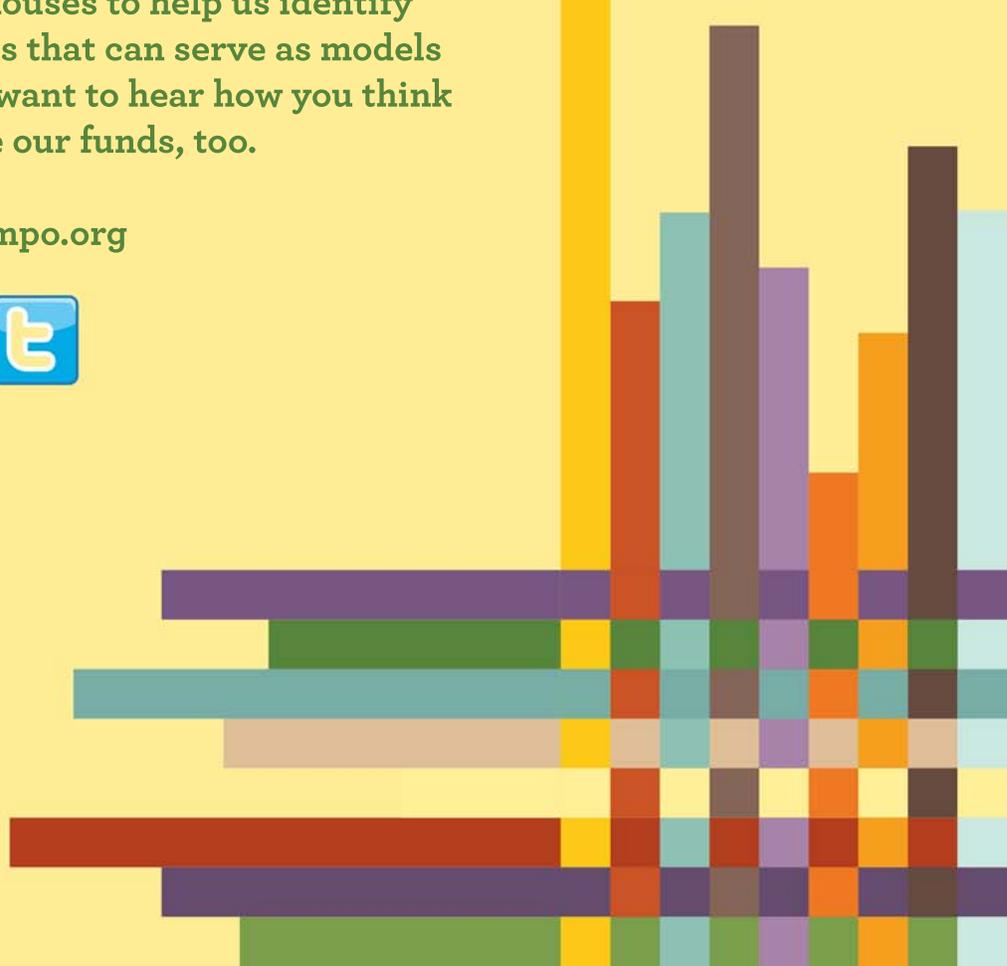
Tuesday, March 4th
5:30 pm

Des Moines Area MPO
420 Watson Powell, Jr.,
Way, Suite 200
Des Moines

Wednesday, March 5th
11:30 am

Pleasant Hill City Hall
5160 Maple Drive
Pleasant Hill

Thursday, March 6th
7:30 am

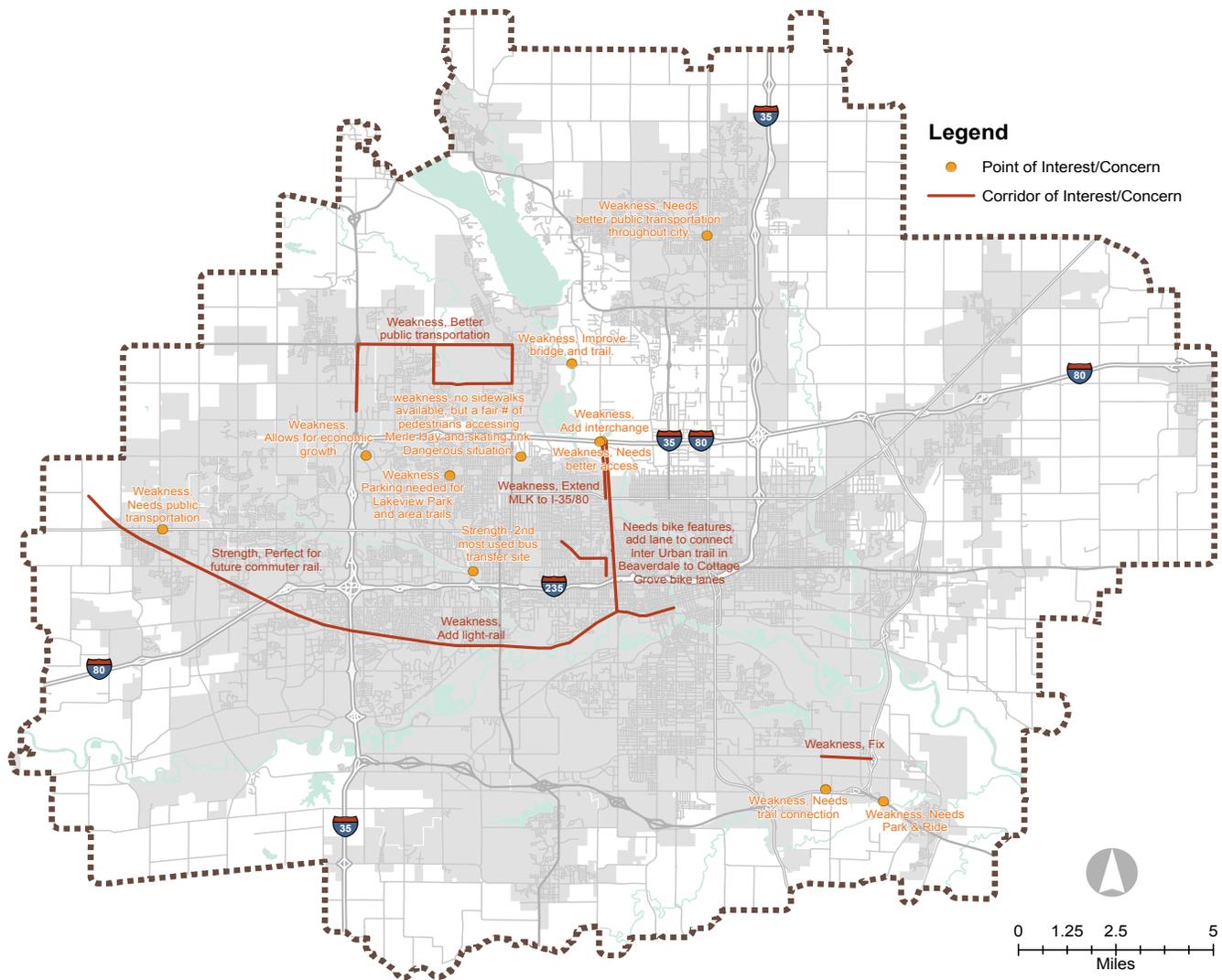


The second activity allowed participants to identify strengths and weaknesses of the current transportation system. A map of the MPO Planning Area was provided and participants were encouraged to identify specific issues on the map. Participants also could identify strengths and weaknesses of the transportation system in general. Figure G2 lists general strengths and weaknesses of the transportation system, and Figure G3 maps more specific strengths and weaknesses.

FIGURE G2: GENERAL STRENGTHS AND WEAKNESSES OF THE TRANSPORTATION SYSTEM

STATEMENT	STRENGTH OR WEAKNESS
Generally fast when travelling in a private auto.	Strength
Buses are on time.	Strength
Good service by the bus crews.	Strength
Too few alternatives if traffic backed up.	Weakness
Too few alternatives to private autos for anything other than recreation.	Weakness
Too much focus on highways and new roads.	Weakness
Mass public transportation needs to improve.	Weakness
More promotion of bicycling for kids to school.	Weakness
Northside access to I-35/80.	Weakness
Better bike access to SE/NE Des Moines.	Weakness
Light rail option between cities in Iowa.	Weakness
I-80 getting overly crowded between Hubbell Ave/HWY 330 and freeway.	Weakness
Priority? Money for higher capacity (I-35/80/235) vs. Deteriorating infrastructure (bridges) and transit (light rail).	Weakness
Finish SE Diagonal and improvements to Army Post Road.	Weakness
Enhance funding sources for maintaining and improving.	Weakness
Encourage and facilitate less reliance on the automobile for transportation, especially the one-occupant car.	Weakness
More use of walking, biking, and mass transit alternatives.	Weakness
Direct funding to supporting alternatives such as walking, biking, and mass transit.	Weakness
Carefully limit building more new roads. Use road funds for upkeep and repair of existing roads and bridges.	Weakness
Respect natural areas and flood plains when new or significantly expanded roads are planned. Allow adequate buffers along rivers and streams.	Weakness
City planning needs to be "smart". Growth and development in a compact, contiguous, and sustainable manner. Plan for complete streets and trails that are connected and functional.	Weakness
Carlisle had access to assistance with their bike/pedestrian planning through Smart Growth. It would be good to provide assistance similar to this throughout the area.	Weakness
Don't make trails compete with roads in funding; have a separate pot of money for the trails. And plan for continued maintenance of trails.	Weakness
Wider interstates with associated dollar and social costs are just not serving the purpose. MPO should be thinking terms of an area light-rail system by 2030 years or less.	Weakness
Des Moines and vicinity needs light rail and all that goes with it, e.g., less urban sprawl by housing adjacent to stations.	Weakness

FIGURE G3: SITE SPECIFIC STRENGTHS AND WEAKNESSES OF THE TRANSPORTATION SYSTEM



The third activity offered a sheet of butcher paper at the open house and asked for other comments the participants had about the transportation system or the plan. Comments offered on the butcher paper are included on the following page.

- More Road diets
make better use of existing infrastructure, make existing roadways more efficient.

Butcher Paper Comments - Outreach 1

Complete Streets policy/ordinance passed in every city/county.

More road diets. Make better use of existing infrastructure, make existing roadways more efficient.

More/better routes for low-income neighborhoods.

Incentives for carpooling.

MLK to I-80 - open up corridor to better access/land uses.

Encourage better use of existing infrastructure.

More promotion of carpooling.

Education on importance of public education.

Events where people arrive on public transportation.

Less cars in downtown.

Smaller buses for low-use routes. Also consider solar panels on top of buses to run electric.

Control sprawl - don't build new roads "just because" developers are requesting them.

Plan for an increasing aging population.

More bicycle lanes.

Bridges are crumbling.

GPS app integrated with busses to show "time to next bus".

Don't 6-lane Hickman or 141.





MOBILIZING TOMORROW

A Transportation Plan for a Greener Greater Des Moines

What kinds of transportation projects should the region fund?

Share your priorities at one of these events:

Wednesday, June 18 | 4:30 to 6:30 pm
Altoona Road Riders Group Ride - Rasmussen Bike Shop Altoona
307 8th Street Southwest, Altoona

Thursday, June 19 | 5:00 to 7:00 pm
Johnston Green Days - Johnston Commons
6700 Merle Hay Road, Johnston

Saturday, June 21 | 12:00 to 2:00 pm
Iowa Juneteenth Observance - Evelyn K. Davis Park
14th Street + Forest Avenue, Des Moines

If you can't join us in person, join the discussion online at www.dmampo.org!

MPO staff also sought feedback on projects that had been submitted by member governments for consideration in the plan. To gather this feedback, MPO staff hosted an interactive map on its website that illustrated all projects submitted for consideration along with basic information about each project. Participants could review the projects and then submit comments via an online form.

FIGURE G4: ONLINE COMMENTS RECEIVED ABOUT PROJECTS SUBMITTED

PROJECT ID	COMMENT	MODE DISCUSSED	FEEDBACK
5	Good addition and expansion of the metro trail system.	Trail	Favor
11	Another good way to expand the regional trail system	Trail	Favor
40	"This one. Please, please, please! My bike commute from Altoona would be about 400% safer with this one."	Bike	Favor
41	"This one. Please, please, please! My bike commute from Altoona would be about 400% safer with this one."	Bike	Favor
62	Sprawl inducing project. Don't do it.	Road (new)	Oppose
115	I'm in favor of this.	Trail	Favor
139	Additional MUPs are always appreciated.	Trail	Favor
172	Please include sharrows, even though bike lanes won't fit	Bike	Add/Consider in Project
172	6th Avenue is an historic thoroughfare. It should be taken care of and rejuvenated. The old city hall and other historic buildings should be refurbished for modern uses that enliven the community and the street itself should create a sense of importance to this historic neighborhood. I live right off 6th and would greatly appreciate seeing improvements to the streetscape.	Streetscape	Favor
180	If this is bridge replacement, please include space for protected bike lanes.	Bike	Add/Consider in Project
186	Please do the SE trail connector. My bike commute from Altoona would be muuuuuuch safer.	Trail	Favor
213	Please consider incorporating protected bike lanes into this bridge and tying in to the trail system.	Bike	Add/Consider in Project
217	Good place to try some form of protected bike lanes??	Bike	Add/Consider in Project
234	Please keep this bridge	Bike	Add/Consider in Project
234	"Over the years I have used the Jackson Street Bridge many many times when biking the trails and heading into downtown Des Moines. It is a wonderful old bridge that provides much needed access across the river, as well as character and history to the area. Please give your strong consideration to supporting the restoration of this very important bridge in our downtown, especially as the south side of downtown begins to take shape and continues to grow."	Bridge	Favor
234	Please provide funds to rehabilitate this bridge. As it is now, with the closure, it is an eyesore on an otherwise beautiful trail system.	Bridge	Favor

FIGURE G4: ONLINE COMMENTS RECEIVED ABOUT PROJECTS SUBMITTED (CONTINUED)

PROJECT ID	COMMENT	MODE DISCUSSED	FEEDBACK
238	If this is a bridge replacement, please design with enough space for protected bike lanes.	Bike	Add/Consider in Project
250	Please make sure improvements to pedestrian facilities are included.	Pedestrian	Add/Consider in Project
256	Great project; please include.	Bridge	Favor
259	Please ensure space if available for bike lanes.	Bike	Add/Consider in Project
260	Any on-street bike facilities or parallel paths would be useful, as this road is very close to the trail system.	Bike	Add/Consider in Project
264	this seems like a really good idea	Road Reconfigure	Favor
274	Please add a multi use trail to this bridge and tie it into the trail system	Trail	Add/Consider in Project
279	Please keep this bridge	Bridge	Favor
281	Please expand the multi use trail on this bridge, or consider a protected bike lane.	Bike	Add/Consider in Project
296	Please consider protected bike lanes as part of this project.	Bike	Add/Consider in Project
314	Would like to see bicycle lanes or paths included on this bridge replacement.	Bike	Add/Consider in Project
320	Hard to see this as actually needed. Induced Demand, IDOT?	Road Widen	Oppose
323	Hard to see this as anything besides a giveaway to the construction industry. Has IDOT even heard of the term Induced Demand?	Road Widen	Oppose
329	Hard to see this as anything besides a giveaway to the construction industry. Has IDOT even heard of the term Induced Demand?	Road Widen	Oppose
331	Hard to see this as anything besides a giveaway to the construction industry. Has IDOT even heard of the term Induced Demand?	Road Widen	Oppose
332	Hard to see this as anything besides a giveaway to the construction industry. Has IDOT even heard of the term Induced Demand?	Road Widen	Oppose
353	instead of 10-lane, could reversible HOV facilities be considered? Could boost shared-rides and provide better speeds for DART or other transportation servicers	Transit/HOV	Add/Consider in Project
361	Please include a trail/MUP on this project. It ties very well into the trail system.	Trail	Add/Consider in Project
363	Please add on street bike facilities if at all possible.	Bike	Add/Consider in Project
393	Sprawl inducing project. Do not support.	Road (new)	Oppose
399	As someone who has biked on this road to get to work, and been honked at by impatient drivers, improved access to bikes/peds would be very helpful	Bike	Add/Consider in Project
400	3 foot wide paved shoulder are not much space for bicycles. Any additional space that can be added would be appreciated.	Bike	Add/Consider in Project
417	This section of trail is definitely in need of reconstruction. Trail widening is needed.	Trail	Favor
417	Rebuilding this trail will be good for commuters who use the trail.	Trail	Favor
431	Adding on-street or adjacent bike path to the eastern portion of this project would be very helpful. Not easy to bike on currently.	Bike	Add/Consider in Project
431	This seems like a good project. It would be best if it included improving the bike trail along it from Patricia Dr to Mary Lynn Dr. It's badly needed.	Bike	Add/Consider in Project

FIGURE G4: ONLINE COMMENTS RECEIVED ABOUT PROJECTS SUBMITTED (CONTINUED)

PROJECT ID	COMMENT	MODE DISCUSSED	FEEDBACK
448	Unnecessary, and contributing to sprawl.	Road (new)	Oppose
449	Unnecessary, and contributing to sprawl.	Road (new)	Oppose
450	Unnecessary, and contributing to sprawl.	Road (new)	Oppose
451	Unnecessary, and contributing to sprawl.	Road (new)	Oppose
455	Another unnecessary project. Don't do it.	Road (new)	Oppose
503	This project seems unnecessary. Why are continuing to facilitate sprawl?	Road (extension)	Oppose
513	Unnecessary, and contributing to sprawl, The City of WDM should work on improving infrastructure for other modes, like bike bus and pedestrian. Continuing a car-centric transportation system is irresponsible.	Road (extension)	Oppose
515	Unnecessary, and contributing to sprawl. the city of WDM should work on expanding transpo infrastructure for other modes besides cars.	Road (extension)	Oppose
518	Unnecessary, and contributing to sprawl, WDM should work on improving infrastructure for other modes, like bike bus and pedestrian.	Road (new)	Oppose
523	This is a terrible idea. Cut through some of the most used portion of the Greenbelt trail to build another road? Bad idea, City of WDM.	Road (new)	Oppose
524	Unnecessary, and contributing to sprawl, WDM should work on improving infrastructure for other modes, like bike bus and pedestrian.	Road (new)	Oppose
526	Unnecessary, and contributing to sprawl, The City of WDM should work on improving infrastructure for other modes, like bike bus and pedestrian. Continuing a car-centric transportation system is irresponsible.	Road (new)	Oppose
529	Unnecessary, and contributing to sprawl, WDM should work on improving infrastructure for other modes, like bike bus and pedestrian.	Road (new)	Oppose
530	Unnecessary, and contributing to sprawl, WDM should work on improving infrastructure for other modes, like bike bus and pedestrian.	Road (new)	Oppose
532	Another example of WDM's attempt to sprawl their way to success. Do not support.	Road (extension)	Oppose
537	All road expansion projects in this area show a complete lack of creativity on the part of WDM. Suburban sprawl is not going to continue at the same rate it used to, and unless WDM changes its strategy it will be stuck with empty malls and subdivisions.	Road (new)	Oppose
542	Bike Lanes are very much needed here. Makes a lot of sense with 25 mph speed limit. Had a friend get grazed by a car while biking.	Bike	Favor
542	This would be a great improvement. It's very difficult to access the businesses in this area on bike currently with any feeling of safety. I was just riding on University yesterday and a car came within a couple of feet of hitting me when passing with another car in the lane over.	Bike	Favor
543	Bike Lanes are very much needed here. Makes a lot of sense with 25 mph speed limit. Had a friend get grazed by a car while biking.	Bike	Add/Consider in Project
545	Great project. This trail gets a lot of use, not only from recreational cyclists but also people trying to bike to work.	Trail	Favor
551	If this is a BRT route, then yes yes yes please do it. Much needed for DSM.	Transit	Favor
551	It isn't clear what the proposed project is... There is a route there. Is this for more service? Different service?	Transit	Question

Residents also had the opportunity to e-mail comments to the MPO at any time. The following comments were emailed during Outreach Series 2.

Emailed Comments - Outreach 2

I fully support greater focus on maintenance and fewer dollars to expanding roadways. We first need to keep existing infrastructure in good condition.

I also encourage the plan to consider and support alternate forms of transportation; biking, walking, and buses, for instance.

- Ginger Soelberg

1) DSM and Ames need a better connection using public transit. Dart and Cyride should team up on a service every 2 hours. Huge potential of creatives and consumers mixing.

2) Emphasis on density. I don't endorse using my tax dollars for suburban sprawl, which will spread to Omaha if we don't enact pro-sustainability policies (eg urban greenbelt) soon. Therefore, I'm against the Alice's Road extension.

3) Emphasis on public transit. More park and ride programs, with long term plan for commuter LRT. Within city, board should move forward on BRT loop plan so that consistent and frequent routes are established (and not just during rush hour). This will also boost the economy along the route.

4) Speed bumps on Locust and Grand between the Capitol and Meredith so that it's more pedestrian and biker friendly.

5) Protected bike lanes. There's tons of ideas out there. Cities should be designed with a child's mindset.

- Eric Gross

Light rail should be an immediate issue. High speed rail, although 50 years behind the time, and I realize beyond MPO's efforts but should be at least mentioned.

- Merle Prater

Outreach Series 3

The MPO hosted the third outreach series in September and October 2014, which sought comment on the draft plan document. The third outreach series also served as the required 45-day comment period. MPO staff initiated the public comment period on September 2, 2014. On October 1, 2014, the Iowa DOT and FHWA recommended that the MPO restart the 45-day comment period as updates to the draft plan, specifically the project list, had been made after the start of the 45-day comment period. Therefore, the MPO commenced a new 45-day comment period on October 3, 2014.

The MPO hosted three joint open houses with the Polk County Housing Trust Fund, who was seeking comment on a long-range affordable housing plan, Housing Tomorrow, and a fourth open house on its own. At each meeting, informative boards were presented that included a summary of the plan's performance measures and targets, investment strategy, proposed multimodal network, and proposed roadway projects. Participants were able to provide comments via comment cards, on butcher paper at each open house, or via e-mail or social media.

WELCOME

MOBILIZING TOMORROW

- and -

HOUSING TOMORROW

MORE MOBILIZING TOMORROW INFORMATION | MORE HOUSING TOMORROW INFORMATION
WWW.DMAMPO.ORG | WWW.PCHTF.ORG

Public Feedback Invited on Two Major Long-Range Plans

Events make it convenient to provide input on both transportation and housing

DES MOINES (September 16, 2014) Now is the time for Greater Des Moines area residents to weigh in on two, long-range plans that will impact the region's transportation and housing for decades to come. The combined opportunities will take place in Ankeny, West Des Moines and Des Moines.

Leaders for *Mobilizing Tomorrow*, through the Des Moines Area Metropolitan Planning Organization (MPO), and *Housing Tomorrow*, through the Polk County Housing Trust Fund (PCHTF), are working together and providing citizens the opportunity to provide feedback on a plan to invest millions of dollars for future transportation, as well as participate in activities that will be part of creating the first regional plan for affordable housing. The co-sponsored events are scheduled for:

- September 23, 5-7 p.m., Ankeny City Hall (Council Chambers) 410 W. First St. Ankeny
- September 24, 5-7 p.m., Westside Community Center, 134 6th St. West Des Moines
- October 2, 11 a.m. - 1 p.m., DART Central Station, 620 Cherry St. Des Moines

Mobilizing Tomorrow and *Housing Tomorrow* support the goals and strategies laid out in **The Tomorrow Plan**, central Iowa's regional plan for sustainability.

"While the stated purpose of the events is to gather input, they also do something else important – create momentum," said Todd Ashby, Executive Director of Des Moines Area MPO. "As we wrap up public input on the transportation plan and put the housing plan in motion, it is clear this is a community committed to collaboration, coordination and the action needed for the long-term health and success of the region."

Central Iowa is expected to grow by over 250,000 people by 2050. Moving people, not just cars is an important shift in focus, so is anticipating and having available the variety of housing needed for a growing and changing demographic.

"*Housing Tomorrow* will answer key questions such as, Where should new housing be built? Do we need apartments, townhomes, or single-family houses? How do housing prices match up to the income of our workforce?" said Eric Burmeister, Executive Director of PCHTF. "Imagine the far-reaching impact and

benefits of quality housing options for every income level and situation – near the places people work, where children go to school and along transportation corridors. That's the purpose of this plan."

PCHTF is in the middle of its public input process. In addition to the joint events with MPO, PCHTF staff will also gathering input at the Urbandale Streets Alive Sept. 21; the University Avenue DSMove event Sept. 28; Valley Junction Farmers Market Oct. 2; and the Downtown Farmers Market, Oct. 4. To learn more and to sign up for the monthly eNewsletter visit www.pchtf.org.

Comments on the draft *Mobilizing Tomorrow* plan, which will guide the allocation of approximately \$23 million in annual federal funding, will be taken until 4:00 pm on October 16, 2014. The draft plan can be viewed at www.dmampo.org/mobilizing-tomorrow. In addition to attending the upcoming events, people are also encouraged to email comments to info@dmampo.org.

Media Contacts

Todd Ashby, Executive Director, Des Moines Area MPO
(515) 334-0075 tashby@dmampo.org

Eric Burmeister, Executive Director, Polk County Housing Trust Fund
(515) 282-3233 eburmeister@pchtf.org

About MPO

The Des Moines Area Metropolitan Planning Organization acts as a regional forum to ensure coordination between the public and local, state, and federal agencies in regard to planning issues and to prepare transportation plans and programs. The MPO develops both long- and short-range multimodal transportation plans, selects and approves projects for federal funding based upon regional priorities, and develops methods to reduce traffic congestion.

About PCHTF

The Polk County Housing Trust Fund is the comprehensive *planning, advocacy and funding* organization for Affordable Housing in Polk County Iowa. Focused around these three core activities, the Housing Trust Fund is responsible for crafting the community strategic plan for affordable housing and leading its implementation. It is also tasked with helping the community understand the need for and benefits of adequate affordable housing. Finally, the organization is responsible for allocating community funds aimed at increasing and preserving the inventory of affordable units in the County and improving the lives of the people who live in them.



PUBLIC NOTICE

October 3, 2014

***Mobilizing Tomorrow*: Final draft review time extended**

Mobilizing Tomorrow is the MPO's next long-range transportation plan and outlines how the 17 communities in the region will invest approximately \$600 million in transportation funding over the next 35 years. Mirroring goals of The Tomorrow Plan, it begins to shift focus to maintenance of the transportation system and support for a multi-modal network.

The MPO seeks public comment on the draft *Mobilizing Tomorrow*, a long-range transportation plan that will guide the allocation of approximately \$13 million in annual federal funding. Due to the addition and shift of future transportation projects, the Des Moines Area MPO is extending the public comment period. Comments on the plan will be taken through Wednesday, November 19, and can be emailed to info@dmampo.org.

The long-range plan is significant due to the region's steady growth in population, expected to increase from approximately 480,000 people today to 750,000 people by 2050. For the last year the MPO has worked with the 17 member governments to determine growth trends, model the needs of the future transportation network and outline trends in transportation planning. The federal government mandates that MPOs plan 20 or more years into the future and account for all regionally significant road, transit, freight, ITS, walking, biking and trail projects.

The draft plan is available at www.dmampo.org/mobilizing-tomorrow.

Comment Sheets - Outreach 3

Protected bike lanes are critical to converting people to bike commuters and making biking a viable alternative to biking. - Gunnar Olson

Concerning the changing of Highway 5 bypass to an Interstate designation. There needs to be bridge built across the Des Moines River to accommodate the farm traffic. This bridge needs to be built first.

More public transportation.

If we can't afford to do a project in our community, we shouldn't do it. Stop begging for federal money we don't have. Keep decision making local.

Access to public transit should be taken into account when land-use decisions are made. - Gunnar Olson

Please invest in public transit!

Do what you said you were going to do - and what the public clearly wants - and invest more money in public transit.

Invest more in complete streets. Require all new and updated road projects to be complete streets. - Gunnar Olson

More public transportation into Ames + Des Moines.

Like, support, and urge the Policy Committee to support the investment strategy in the proposed LRTP.

Investing in multimodal projects will reduce the long-term infrastructure costs, stormwater management costs, health care costs, etc..

I support more funding for multimodal transportation - biking, walking, and transit. Would like to see greater planning and implementation of BRT, the downtown street car, and light rail similar to options studied in preparation for the last I-235 reconstruction.

In The Tomorrow Plan rankings of funding priorities from 1 to 14 by the citizens of the MPO region, participants ranked the following:

- #5 - Improve public transportation system
- #9 - Create new bicycle paths and facilities
- #11 - Expand the trail network
- #13 - Add more parking
- #14 - Add more roads

These [#13 and #14] are at the bottom of the public's ranking and these rankings need to be reflected in the LRTP funding priorities

Support the goals of The Tomorrow Plan and the Capital Crossroads plan (Physical Capital & Natural Capital) by providing greater funding for transit, bicycling - including on-road bicycle facilities, and walking.

To leverage LRTP funding for the greatest impact integrate (require) complete streets and green streets practices into all reconstruction and new construction projects.

Comment Sheets - Outreach 3 (continued)

The LRTP needs to reflect the priorities/goals/strategies of The Tomorrow Plan.

More funding (higher %) of transportation funds needs to be dedicated to transit, walking, and biking. The plan indicates the area has all of the lane capacity necessary through 2050 so road expansion and new road needs to be of lower priority in the plan.

Please give priority to: bus transit, on-street bike facilities, reduce traffic lane widths.

With car ownership going down, vehicle miles traveled going down, and an aging population, a greater emphasis on transit, walking, and biking is needed. Support the investment strategy in the proposed LRTP.

More emphasis on pedestrian infrastructure throughout the metro. Attention to details - example, different sizes of fonts for street signs. Add East Village to freeway signage.

From residents and visitors, several compliment the bike trails in the Metro. The cost compared to use trails suggests more should be built, and current trails maintained. I would like to see a train system through Des Moines and connecting the City east to Chicago.

More money for sidewalks, trails, and safe routes to schools.

The downtown crosswalk by 4th Street is rarely stopped for by vehicles. The flow of traffic is disrupted when some cars stop and others do not. It seems dangerous for pedestrians and prone to crashes. It seems visibility should be heightened, or the crosswalk should be removed.

I would like to see the type of protected bike lanes, like in the "All-Inclusive Street Design" image. Also, more "green" transit (hybrid buses) and electric charging stations for vehicles. I think Des Moines bike trail system is a high point for the city, so definitely keep maintaining/improving that. I like street scapes - they make me want to visit those areas of the city and walk in those areas.

Des Moines is on the brink of really cool things (businesses, development, recreation, entertainment) but one area of focus and growth needs to be multimodal options. 1) Protected bike lanes; 2) rapid transit; 3) car share systems; 4) light rail; 5) Uber. Bike trails are great! I hope we maintain the trail system

I enjoy streetscapes - they really beautify the street. Improved public transit would be useful. Make crosswalks more visible to drivers. Wider sidewalks. I really like the parking meters that let me pay with a card.

Protected bike lanes would be awesome in Des Moines. So many other cities in the Midwest and country have them and they are great ways to travel in town. It's difficult to feel safe without them as both a cyclist, driver, pedestrian, etc.

Late night D-Line and weekend service. Sidewalks downtown need major repair. Don't settle and demand high design standards for key projects.

Facebook Comment

Wish I could be in town to attend. 1. Use HOV lanes. 2. Establish urban growth boundary to increase density. 3. Commuter rail study from Waukee through WWP to south downtown. 4. Tighten code to force green building.

- Elliöt Klimowski

Mailed/Emailed Comments - Outreach 3

I support the Tomorrow Plan. A Complete Streets policy is necessary to consider all users and all modes of transportation. Simply adding lanes and more streets is not the answer. We can solve our future needs with Smart Growth principles like Mixed Use Zoning, parking studies, building village's verses traditional zoning. We need to promote walking, biking, and public transportation. We need greater density. I am available to advocate on behalf on this plan. Thanks.

- Jon Werger

As an Ankeny City Councilmember and a private citizen I submit the following comments to the Mobilizing Tomorrow draft plan and funding priorities:

- Increasing transit funding from 10% to 15% at the expense of surface transportation funding is not only unnecessary but a misuse of public dollars. It appears that DART is simply looking for alternative revenue sources because the community was not supportive of their proposed tax increase last year and voiced the opinion that the community would not be supportive of increases in future years. DART is trying to fund the DART Forward 2035 plan, which I personally am not in favor of and many of my constituents are not in favor of because it takes a "build it and they will come" approach as opposed to supplying an actual demand. Maintaining transit funding at 10% would not lead to a decrease in funding for transit and would allow the pool of funds to be used more appropriately to meet the needs of Des Moines metro residents.

Although I have many other general comments on the draft transportation & housing plans, the above is my main concern. My other concerns are all related and are due to the unsupported statements regarding demand for numerous modes and types of transportation and housing; as well as basic ideals stated in the Plan as collective ideals which are quite slanted in viewpoint and not in line with my community. When the fastest growing areas of the metro are in the furthest suburban areas such as Ankeny, it is quite telling as to what our residents are looking for in terms of housing and transportation options. Their needs and demands are not in line with the goals of these plans, and this is the population that for the past 20 years has continued to help the greater Des Moines area thrive, and will continue to do so into the future.

Thank you for the consideration and review of the above comments.

- Bobbi Bentz, Ankeny City Council, Ankeny resident

Several times at The Tomorrow Plan meetings I heard comments that plans tended to just get stuck on the shelf. Mobilizing Tomorrow gives us hope and direction for real action. The Natural Areas map is one example of this. Also, evaluating current conditions of bridges and roads should help focus where the real need is; in my estimation it is to maintain and repair, in many cases taking priority over new roads.

One specific need I see is for more sources of funding for "Safe Routes to Schools." Safety, health, education, equal opportunity and a number of other reasons make this very high on my list of transportation needs! Truly mobilizing tomorrow's generation.

Thanks for the chance to comment.

- Virginia Soelberg
Johnston, Iowa

Mailed/Emailed Comments - Outreach 3 (continued)

284

Dear Des Moines Area Metropolitan Planning Organization Staff:

As a representative of the future generation, I am 13 years old, I would like to see better transportation for the future that will be both sustainable and cost efficient. A transportation system that is more publicly centered transportation.

I would like to see a transportation system that creates less congestion and helps benefit the health and well-being of people with not only transportation by vehicle but also by being able to walk or ride a bike to our work places.

I want to see a transportation system that keeps our cities healthy and clean and helps kids and adults of all ages have more enjoyable and healthy way to mobilize themselves.

I would like to be able to have places where we can cross roads safely and be able to commute to our public areas with less danger from cars and better accessibility to move around places safely.

I want a transportation system that makes our walking paths more enjoyable by having decorative landscapes along the way of the sidewalks to create a more friendly and inviting walking space so more people will be enthusiastic about walking and using public transportation systems that will save money and help keep the streets and air clean and reduce the number of stressed commuters.

As you plan for transportation, please consider the impacts on future generations like mine so that we will have many ways to get around without having to spend thousands of dollars on cars and things that will hurt our environment's well-being and health and beauty of the city.

Sincerely,

- Kyle Geerts
5409 NW 78 CT
Johnston, Iowa 50131

I am writing about the plan for the 15% set-aside in support of public transit in the Mobilizing Tomorrow Plan. I write from two perspectives, both of which make me place a high value on promoting public transit in the Des Moines Metro Area. I strongly urge our decision-makers to continue to invest in public transit – and to take reasoned steps to increase that investment over time. The 15% recommendation seems a well-balanced, measured commitment to incorporate into the transportation funding mix – enough to move the needle, but not to excess.

First, as an Urbandale resident, I ride the bus frequently. It expands my day in terms of time for myself and saves me the stress and hassle of driving – not to mention the expense. It is a definite cost-savings. I know many more will find benefits in public transit as we increase the convenience of our system and continue to encourage its use. It promotes my personal mobility – as it requires some shoe leather (or cycling) investment on my part. And the fact I have ready access to public transit gives me some level of confidence that I can age-in-place in my Urbandale home, even when my ability to drive goes away. AARP data shows I'll have 11 years as a non-driver. That brings me to my second perspective . . .

As the daughter of an 89-year-old woman – who is still sharp enough to humble you in a game of bridge, but rarely afforded the opportunity to play. She is on her 14th year as a non-driver, and lives as a near recluse. She has no ready access to affordable public transit in her St. Louis suburban home.

I strongly urge we do not repeat the mistake of other urban-suburban regions and make ongoing, sensible investments in public transit to strengthen all of the communities within Central Iowa.

Sincerely,

- Pat Boddy, PE
7932 Rocklyn Drive
Urbandale, Iowa 50322

An Age-Friendly city is an inclusive and accessible urban environment that promotes active aging.



November 12, 2014

Metropolitan Planning Organization Policy Committee
Des Moines Area Metropolitan Planning Organization
420 Watson Powell Jr. Way, Suite 200
Des Moines, IA 50309-1631

Dear MPO Policy Committee Members:

Access to reliable, convenient, and diversified transportation systems is critical to the independence and self-sufficiency of older adults. Iowa's 838,000 Boomers, those born between 1946 and 1964, expect to remain in their local communities and successfully age-in-place for the foreseeable future. Polk County and greater Des Moines have the largest 50+ populations in the state (122,900 Polk County; 53,400 Des Moines).

Iowans over the age of 50 are major contributors to the economy, specifically \$48 billion in consumer spending annually, primarily in health care, non-durables, and financial services. As this population segment continues to increase over time, it is in our community's best interest to strengthen those local services like transportation to sustain economic growth and anchor these individuals in our neighborhoods.

The Age-Friendly Greater Des Moines Project is dedicated to provide an inclusive and accessible environment that promotes active aging. This project advocates for available and affordable transportation which operates frequently and reliably with appropriate destinations providing comfort and safety for older consumers/passengers. Those adults with special needs (walkers/wheelchairs) require adapted transportation systems to keep them mobile and engaged in the community. For older drivers, the Age-Friendly Cities Project's goals are streets and highways which are well-regulated, in good driving condition, with ample and easy to read signage, and parking which is affordable and convenient.

According to the *Tomorrow Plan* and the *Iowa Climate Statement 2014: Impact on the Health of Iowans*, growing environmentally sensitive infrastructure such as transit, trails, on-street bike lanes has co-benefits of reducing air pollution and improving health. Older pedestrians and cyclists desire safe and barrier-free sidewalks and pathways which will enhance health and well-being, improving the elders' overall quality of life.

We, the Age-Friendly Greater Des Moines Project leaders, support enhancement and maximization of funding from the Metropolitan Planning Organization for transit and transportation alternatives to be utilized by the growing 50+ population in our community.

Thank you for your kind consideration.

Respectfully,

Joel L. Olah, Ph.D., LNHA
Executive Director
Aging Resources of Central Iowa

Yogesh Shah, M.D., M.P.H., FAAFP
Associate Dean Global Health
Des Moines University

Kent Sovern
State Director, AARP Iowa

JLO/eag





400 E. COURT AVENUE
SUITE 118
DES MOINES, IA 50309
515.288.3328
www.taxpayersci.org

Mr. Todd Ashby, Executive Director
Des Moines Area Metropolitan Planning Organization
420 Watson Powell Jr. Way, Suite 200
Des Moines, IA 50393

November 19, 2014

Dear Todd:

Thanks for the opportunity to review the draft "Mobilizing Tomorrow" plan. From a taxpayer standpoint, we agree it is important for our transportation system to support the growth that is anticipated to occur in our region over the next 25-35 years, and we believe it should be done in a way that is both cost-effective and responsive to the desires of people who live here.

We note the only statistically representative survey referenced in the plan (taken from the Tomorrow Plan) ranked "lower taxes" as the #1 most important thing respondents would like to see in the region. This suggests that cost-effectiveness be a primary consideration as various plan alternatives are considered.

The plan identifies goals/targets for the share of total downtown peak-hour trips to be made by various modes. What is the reasoning behind these allocations? For example, the plan would move the target for public transit from 7 percent to 20 percent, while the goal for carpooling is moved from 12 percent to just 15 percent. Is this because transit is more cost-effective than carpooling, because we are near the practical upper limit for carpooling, or for some other reason(s)? How do these alternatives compare in terms of their cost-effectiveness?

Another part of the plan speaks to the importance of minimizing the negative impact of our transportation system on the environment. Operational improvements have been found to be one of the most cost-effective ways to reduce fuel consumption and emissions, yet they are not referenced as a strategy for doing so. It could be more cost-effective to improve signalization systems and remove barriers that preclude turns on red, or any number of other operational strategies, than to shift more people onto buses. And wouldn't it be preferable to first reduce consumption and emissions through improvements in operational efficiency than to purposefully increase the cost of driving? We would urge you to place more emphasis on these types of strategies.

We applaud the look ahead and the many good ideas contained in the plan, but encourage the MPO to use some cost-effectiveness rubrics and comparisons as choices are made in our transportation system. We believe this would be consistent with what survey results have indicated.

Sincerely,

A handwritten signature in black ink that reads "Gretchen Tegeler". The signature is written in a cursive, flowing style.

Gretchen Tegeler, President

Mailed/Emailed Comments - Outreach 3 (continued)

Thank you, all, so much for your service to our community. And, Mayor Gaer, thank you for hosting and participating in the Greater Des Moines Leadership Institute's Governance Panel yesterday. I sincerely appreciate the effort to increase regional collaboration. It just makes sense.

Something else also makes sense to me: ensuring a sustainable future for our community. Today, I am writing as a citizen of West Des Moines and a champion for Greater Des Moines. I live near 50th and the freeway in West Des Moines. I love my neighborhood because of its convenience, the mature trees, the population density and diversity, the new narrow lanes, access to parks and trails, and so much more.

I have become increasingly aware of how improving access to alternative forms of transportation as well as sustainable development can create for others the feeling I get in my little pocket of West Des Moines. And, I realize the responsibility I have for making known what I support for my city and our region. We have an obligation to create a sustainable future which needs to include an investment in transportation, complete streets, and smarter infrastructure which ultimately lead to better health, increased safety, less strain on the environment, and increased community building.

Please support the increase in investment in transportation at tomorrow's MPO meeting. It just makes sense.

Thank you so much!

- Amy Jennings
1216 49th Street, West Des Moines

Just a quick note to say I support any bike friendly efforts the city can make to increase safety for bike commuters like both me and my husband. We are 60 years old and enjoy using our bikes to get to work and around town. Thank you for seeing the importance of making this a priority, it's not only another way to draw people to live here, it's also the right thing to do for health and the environment.

Enjoy the Day,

- Ann E Reynolds
Teacher Librarian/Title 1 Math
Crestview Elementary School
Clive, Iowa
515-633-5746

Just a concern of where this money will be derived from. I wish to note that I am not against bicyclists, I am against the absolute minority causing such an issue on our at time busy streets. If such an infrastructure is to be built then the bicyclists themselves should be licensed to ride their bicycles while on public roads. This should include both a tax, such as a tag on their bike and a course for safe riding on busy roads. This would also protect the drivers of legal licensed vehicles. One of the issues are very unsafe riders of bicycles on public roads. They create such a bad image that most citizens of this great state find them undesirable! This is not even touching on the extreme dangers they represent while on the hilly, country back roads. Many times I myself have been placed in some extremely precarious positions while driving 50-55 mph, cresting a hill and finding cyclists riding side by side. Not safe at all.

So with this said, having a tag system for bicycles on public roads to offset the cost and having any bicyclists riding on public roads licensed, just as operators of powered vehicles, that just might bring our rating up in a safe and responsible way.

Thank you for raising opportunity,

- Chris Johnson

Mailed/Emailed Comments - Outreach 3 (continued)

288

I would like to comment on the Mobilizing Tomorrow transportation plan and its allocation of funds. I would expect my tax dollars go to a balanced transportation plan, including buses, bicycles, sidewalks, trails, and pedestrian-friendly communities. The automobile should no longer dominate the funding as it has in the past.

The fastest growing segments of our population are the young and the elderly. This transportation plan needs to pay attention to the needs of these groups, and accommodate all. Devoting at least 15% is not unreasonable.

Physical inactivity is a very big health issue, and the public policy needs to support increasing daily, routine, active behaviors (ie. sidewalks, trails, parks, bike routes and other transportation options.)

A personal example: my daughter and her husband recently moved back to Des Moines from Daytona Beach, Florida. Why? Family, job, stress reduction (from an hour-plus interstate commute) and health. Where? Sherman Hills in Des Moines, which is a walkable neighborhood with transportation options. (Eg. the Dart DLine which we recently took to eat, shop, go to the library, and view art.)

I urge the Policy Committee to take a step in the right direction and keep 15% of the transportation funds for multimodal transit options.

Impacts of highway project evaluation often overlooked:

- Public fitness and health impacts
- Generated traffic and induced travel impacts
- Downstream congestion
- Impacts on non-motorized travel (barrier effects)
- Parking costs
- Vehicle ownership and mileage-based depreciation costs
- Project construction traffic delays
- Indirect environmental impacts
- Strategic land use impacts (sprawl vs. smart growth)
- Transportation diversity and equity impacts
- Per-capita crash risk
- Travelers' preferences for alternative modes (eg. walking, cycling)

Thanks,

- Virginia Soelberg
Johnston, IA

Our current residents--aging boomers, those who need or want options other than a car to get to work, school or job trainings, and kids who will benefit from constructive, developmental out of school activities-- need better, more accessible transit options. And tomorrow's residents will have even greater needs and preferences for better and more varied options. A balanced array of options is absolutely vital and we need to begin working to improve transit options right now. We can't wait. Please devote at least 15% of annual federal funding to diversified transit.

- Nina Lynn Greenwood

Mailed/Emailed Comments - Outreach 3 (continued)

That is great, you are trying to address only about 2 percent of the people being transported on our streets. Wonderful! So, when are you going to start enforcing the traffic laws that govern them? Such as very few ever stop, or even slow down at street intersections that have stop signs and traffic lights, of course bicyclists never yield to pedestrians in legally marked crosswalks. And you wonder why more people do not support this project?

I think you had better go back to square one and rethink this whole project. You are just wasting vast amounts of badly needed resources on those same people who do not care about what you are doing, they will just keep on with their same old habits.

You would be much better off spending that same money on police traffic enforcement, and make sure that the officers are enforcing the laws the same to both motorists and bicyclists. But then, the police cannot even enforce the speed laws in School Zones, what makes you think that anyone even gives a dang about bicycles.

I have witnessed several vehicle accidents that involved bicycles, and in each case, the bicyclist violated simple traffic laws, and the accident was NOT the motorists fault.

I only believe in what is fair, is fair. If you choose not to enforce the laws for bicyclists, then you cannot enforce the laws for motorists. You may as well eliminate every traffic light and stop sign in the city, as those laws are NOT enforced fairly.

You asked for comment, and this is mine, on this subject.

- Scott Wilson

The article in the Register peaked my interest this morning. I am in favor of protected bike lanes as well as any infrastructure that makes biking in Des Moines and the surrounding area more feasible. The health, fiscal and social benefits of biking far outweigh the inconvenience to a few drivers who may even prefer to bike if there were a safer system.

My story:

I just began riding a bike this summer. I commute (when it's above 40) from 29th St. in Beaverville to downtown Des Moines via the bike trail along the river which is about 6 miles one way. Oftentimes, after work a friend and I would ride our bikes to Ingersoll to frequent one of the many great restaurants and bars located along that street. That would not have been possible without the bike lanes. However, despite the bike lanes, around 5:00 or 6:00 it is still fairly intimidating with the car commuters and only a painted line with which to separate myself. Moral of the story: more and better bike lanes and infrastructure can only be good for the health, financial and social welfare of Des Moines' citizens.

Please consider these thoughts when making decisions regarding the transportation plan!

- Alex Carter

Mailed/Emailed Comments - Outreach 3 (continued)

290

I hear you have a vote today on funding a bike facilities study, among other things, later today. I'm writing to let you know I believe this would be a boon to the region. We have a good bike system now, but it has the potential to be great.

There are some significant gaps and obstacles in the facilities as it stands currently. Connecting the existing infrastructure to create a more seamless and easy to navigate network of paths should be a top priority for the region. Many people refrain from riding to work, errands, or school because they are scared of a stretch that might measure in the tens of feet on an otherwise safe and pleasant route. One example near where I work is the NW 66th Ave Kempton Bridge. There are trails on both sides of this bridge connecting Johnston to Ankeny, downtown, and the greater trail system, but due to the lack of a safe river crossing, a great number of people decline to commute or recreate by bicycle through this otherwise well-appointed cycling area. There are many other short stretches, road crossings, deteriorated sections, underserved areas, and gaps that pose challenges like this one all over the metro area.

A bike facility study is an obvious first step to finding and prioritizing holes in the network that are keeping our good bike system from being great. With it, we can start to make every neighborhood, workplace, park, service, and business accessible by more ways than just driving.

- Bailey Mader

I have nothing against people riding bicycles, but I do not think a city the size of Des Moines needs designated bike lanes. On our narrow streets, designated bike lanes take up a vehicle lane that is needed by 98 percent of the population and when drivers have to cross the bicycle lane to make a right turn it is extremely dangerous to bikers and drivers. My primary experience with them is on Fifth Avenue in downtown Des Moines during morning rush hour. The bike lane has cut down one lane of traffic, causing a bottle-neck, and I have never seen even one bicycle on downtown Fifth Avenue. In addition, there are always trucks parked in one of the lanes and there seems to be ongoing construction blocking one or more lanes. That bike lane on Fifth Avenue is extremely dangerous and, if anyone ever decides to ride in it anyway, someone is going to get killed. My other primary experience with them is on Urbandale Avenue in Beaverdale. There again, I think they are very dangerous when crossing the lane to turn, although, because of the low volume of traffic, nowhere near the problem they are on Fifth Avenue during rush hour. Also, on Lower Beaver Avenue, parking is allowed in parts of the bike lane which forces bicyclists to go out into traffic, which defeats the purpose of the bicycle lane. It seems to me like Des Moines has plenty of bike trails bikers can use for recreation or, since most of them are connected, to get anywhere they want to go on a safe route designed for bicycles. I also think the cost of the bike lanes far outweighs the need for them. That money could be well spent on something that benefits more people. So what if we don't compete with Minneapolis!

- Carolyn Hollingworth
3923 Lynner Dr.
Des Moines, IA

I have been the manager at the Des Moines Bike Collective since August. Prior to then I was an "occasional" winter commuter and a full time summer commuter. Since August I have become more aware that there is an increase in bike commuters year round. Because these people choose to ride to work, it is important to keep roads and trails safe and clean. Please ensure funding to keep good citizens going to and from work year a round.

Respectfully Submitted,

- Dan Baldi

Mailed/Emailed Comments - Outreach 3 (continued)

Please add my voice to those who advocate for more, better and safer bike lanes throughout the Metro area. Access and safety are the 2 biggest obstacles to bike commuting. More commuters means a healthier citizenry and less congested roadways. Children will feel more comfortable riding if they know there is a buffer between them and the cars. Trails are nice but they are not adequate. If I want to commute to work or just bike to the grocery store I must use existing roadways. Creating safe bike lanes with buffers is much more affordable than creating new trails. If you build them, they will be used. The evidence is overwhelming.

Thank you,

- David DeForest Colvig
646 Harwood Drive
Des Moines, IA 50312

Please vote in favor of the 15% allocation to transit at your meeting this afternoon at 4 PM. I am a bike rider and a member of the Des Moines Bicycle Collective. We need more bike lanes in the City of Des Moines, Iowa.

- David Hance
6033 NE 9th Street
Des Moines, Iowa 50313

I would just like to put my two cents worth in and respectfully ask that you increase the funding for more bicycle facilities in the Des Moines area.

As the President of the Des Moines Cycle Club and Board Member of the Des Moines Bicycle Collective, I can tell you that bicycle usage is on the increase. More and more people are riding bikes, not only for fun and fitness, but for their daily transportation to and from work, the store and other errands.

Having more, and safer bike lanes, as well as bicycle parking is vital to our city and our residents! Please flag this as vitally important, because it truly is. Our numbers are increasing....and that's a GOOD thing!

Sincerely,

- Georgie Libbie

If you provide more infrastructure you can drive habits! Millennials are looking for bike infrastructure when choosing where to live. Let's drive economic growth for DSM and Iowa!

Cheers,

- Jay Polson

I say no more bike lanes . There already getting a free ride. They pay NO FEE FOR ANYTHING if they want let them PAY a yearly fee and insurance and any other expenses that have to do with anything for this I pay over 12 a year in taxes in Des Moines and I VOTE NO. Thank you

- Jon Brones

Mailed/Emailed Comments - Outreach 3 (continued)

292

Greetings,

I prefer commuting by bicycle. Last winter there were probably only 10 days or so that I didn't commute to work by bicycle (approximately 4.5 miles each way). Well designed bike lanes, protected or otherwise, are great and I'm all for them. However, another very significant issue that needs to be addressed is speed! In today's DM Register, Fairmont Neighborhood Association President, Jeff Witte made reference to the bad things that can happen when you are traveling at 45 MPH. He's right and speed is a HUGE part of the problem! Aside from the freeway no legal in-town speed limit should be over 30 MPH. In residential and commercial areas the speed limit should be limited to 20 MPH. Studies have shown that a pedestrian or cyclist who is hit by a motor vehicle doing 20 MPH (or less) has very high chances of escaping serious injury. The victim's chances decline drastically as speeds rise above 30 MPH. Reliable and consistent speed limit enforcement is another issue that needs to be addressed.

Thank you for your time.

- Jeff Bock

Good morning,

After seeing the article in this morning's Register, I wanted to send this message in support of more investments in bike infrastructure.

I moved here in August to attend Drake Law after 13 years in Chicago. The cycling infrastructure changes made in that city over my time there were aggressive, initially controversial, and inevitably effective. They continue to be.

I left my car in Chicago and I've been pleasantly surprised with how little that has affected my commuting. I plan to manage with or without bike lanes, but that's not to say I wouldn't love to see these investments happen. Assuming this town is not the only outlier in this country, I'm certain Des Moines would like to see these things as well.

Word has spread coast to coast that this town has become an increasingly attractive place to live and reside. It has also been drawing in many creative, local businesses. The opportunity for this city to invest more in pedestrian living and to maintain this momentum demands innovative planning.

The ideas themselves are not entirely unknown waters. Cities all over the nation are thriving from these low-cost, highreturn investments. The implementation of programs like this, however, are always bold and commendable.

What is also not new is the inevitable pushback. Being city planners, I'm sure you're more than familiar with this phenomenon. As stigmatized as it is, more cyclists in the roads is a tried-and-true method to increase health, safety, industry, community and urban identity (<http://iowabicyclecoalition.org/wp-content/uploads/2012/04/2012-Economic-Impact-Study.pdf>) (<http://m.fastcoexist.com/3034354/the-cities-that-spend-the-most-on-bike-lanes-later-reap-the-most-reward>).

I can't think of a more perfect initiative for Des Moines.

Thank you for taking the time to read this and I wish you all the best going forward!

- Jeff Perkins

Mailed/Emailed Comments - Outreach 3 (continued)

Dear MPO Board:

For generations, we've designed Des Moines for individual cars. We've cemented that need through building design, traffic management and use of public space. If we stay the course - planning our community around cars - then driving is what people will continue to do. If we develop our community to encourage safe and active transit options – like bike, walk and bus – then that's what will happen.

I vote for more funds for active transportation!

Thank you for consideration.

- Jeremy Lewis

I am writing in regards to the “Mobilizing Tomorrow” MPO plan. While I have tried a couple of times to look at the various (numerous!) parts of the plan, it is a bit overwhelming, and I'm not sure I have fully understood all of its intended ramifications. However, I would like to at least express my convictions and desires at this final hour of planning.

I moved to Des Moines 6 ½ years ago. At that time I enjoyed an occasional walk, but I had never considered myself a “fitness” person. My mode of transportation had always been a car. After moving here, I saw lots of people on bicycles—as well as many people walking, jogging, etc. I had never lived in a community where there was so much healthy activity. I caught “the fever.” I bought a bicycle. I now log nearly 6000 miles a year! I ride my bike as transportation (commuting to work, running errands) as well as for fitness (easily completing 100-miles rides on our trail systems). I have started walking more often and just completed my first half-marathon (as a walker) this year. I walk to the nearby stores and post office in my neighborhood of Beaverville. I once even walked to the Downtown Farmers' Market and was so happy to find that I could go that whole distance via sidewalks. Again, I'm not used to these kinds of luxuries, as my previous residence is not known for either sidewalks or bike trails/lanes.

I recently had opportunity to hear the speakers from The Path Less Traveled, a couple from Portland, Oregon (a.k.a. cycling capital) who were here in Central Iowa for a visit. They were obviously shocked by the expansive trails and bikefriendly mentality of this area. They commented that not even in Portland did they have the expanse of cycling infrastructure that we do here. They also added that cycling means business and economic development for cities. Des Moines recently made a list of “tops” about being a “top place for hipsters to live.” People in the younger generation are not so car enthusiastic as their parents/grandparents. They long for places to live where there is infrastructure in place for walking and cycling. They utilize public transportation. They want that! If Des Moines and Central Iowa want to attract younger professionals here, then having good, solid alternative transportation offerings is the way to do that.

We do have wonderful trails/bike lanes/sidewalks in place. But imagine if they were expanded and improved! Imagine how fewer cars there might be, with less congestion, less pollution, less need for blacktop, and less need for parking areas. Imagine how healthy Iowa could become! I can't tout the benefits of cycling (and walking), and I don't care to ever live in another area because I know there's not a place that compares with here as far as its bike friendliness and recreational trail facilities.

I ask you to PLEASE allocate as much funds as possible not only to transportation in general, but also to alternative transportation (i.e. public transportation, sidewalks, bike lanes, recreational trails, etc.). I want this area to remain and increase in its place as a forward-thinking, clean & green place to live.

- Maryann Mori
4428 Amick Avenue
Des Moines, IA 50310

Mailed/Emailed Comments - Outreach 3 (continued)

294

Please allow more bike lined in Des Moines , I been hit once and sent to hospital with a concussion ! My wife two months ago broke her foot while riding due to car pulling out in front of her! Des Monies needs lots more bike lines !!!!! Take a step forward and approve more funds for lines, also I noticed public buses running one third full most of times. Redirect money for bike lines& move Des Moines Forward.

- Patrick Mitchell.

Please increase funding for bike facilities and infrastructure. These are important for a sustainable and less-smoggy future.

- Rob Aiken, MPA

Many cities in the US have tried and failed to rely solely on automobile transportation infrastructure. Des Moines has a chance to learn from their mistakes. Multi-modal transit options are needed for health, safety, and economic reasons. We can't afford to simply build more roads. I urge you to increase funding for on-road bike infrastructure.

- Scott Bents
Vice Chair, Des Moines Bike Collective

As a resident of Des Moines for the past five years I would like to express my support for the Mobilizing Tomorrow plan. I commute by bike or bus everyday for work and after reading the plan I am very excited about any effort to move Des Moine's future transportation infrastructure system and make it more inclusive for bike and mass transit commuters.

- Scott Flagg

I would like to express my support of the Mobilizing Tomorrow Plan and more specifically the recommended 15% Transit allocation. As a life-long Des Moines resident and more recently downtown Des Moines resident I recognize the need for alternative transportation. I am a walker, driver, bicycle rider and DART rider all of which are part of my daily life and the many people I see walking, riding and DARTing on a daily basis.

In order to attract and retain the best talent we must recognize that transportation options need to be included and expanded. I believe the report prepared by staff proves this out.

Regards,

- Vicki Facto

Mailed/Emailed Comments - Outreach 3 (continued)

Dear Mobilizing Tomorrow Plan Committee:

Attached please find a Public Comments Submission from Zebulon Innovations and Ferrellgas outlining the benefits of a liquid petroleum gas (LPG) as a superior alternative fuel for the consideration of the Des Moines MPO Mobilizing Tomorrow Plan Committee. LPG would provide a cleaner, cost effective, domestically produced fuel that is abundant and has an existing distribution infrastructure that is cheap and easy to scale.

Please let us know if you have any questions with our submission. We stand ready to assist with the Mobilizing Tomorrow project.

Best regards,

- Ken Boyle
Zebulon Innovations
515.289.2121

[See following pages for full comments from Zebulon Innovations and Ferrellgas]



Public Comment Submission by:

Zebulon Innovations, LLC

Ken Boyle
6900 NE 14th Street
Ankeny, Iowa 50023
515.289.2121

Ferrelgas, Inc

Rick Eggermont
7500 College Boulevard, Suite 1000
Overland Park, Kansas 66210
800.649.6553

November 19, 2014

Des Moines Area Metropolitan Planning Organization - Mobilizing Tomorrow Public Comments

Zebulon Innovations and Ferrell Gas applaud the Des Moines Area Metropolitan Planning Organization (MPO) on the initiative to seek a drastic, long term plan for the future of transportation for its participating and associate communities.

While the plan is broad and ambitious in its vision for the region calling for a greater mix of the greater transit network (from increasing pedestrian, bicycle and carpool culture to maximizing the use of rapid transit), our team believes the greatest beneficial element is missing: a plan to increase the number of alternative fuel and supporting infrastructure.

As stated in the "Setting our Sights" section of the Mobilizing Tomorrow MPO (quoted from a Nelson/ Nygaard report developed as part of the *Tomorrow Plan*), the study found that "92 percent of trips in the MPO planning area are made by personal automobile", making light/medium body vehicles the overwhelming majority and preferred transportation mode of the rapidly population that is projected to grow from 450,000 to 750,000 by 2050 in the MPO target area. Again, while it is important to shift the mix of transportation sources, including a robust transit network, an active carpool culture, and land use and design a plan to support walkability, an alternative fuel to drive dramatic benefits for the overwhelming transportation mode are desperately needed. An alternative fuel that is abundant, cheap, domestic, green and has an easily expandable distribution network is readily available - now. The fuel is proven and it is in broad use throughout the world. What we are suggesting is leveraging the use of liquid petroleum gas (LPG) in a hub-spoke transportation system that will allow all types of public and private transportation to adopt the alternative fuel immediately and provide the following benefits and would help the Des Moines Area MPO meet the Mobilizing Tomorrow plan's goals.

Quoted directly from the U.S. Department of Energy, "liquefied petroleum gas (LPG), or "propane autogas" the term for propane when fueling an on-road vehicle, is a clean-burning, high-energy alternative fuel that's been used for decades to power light-, medium- and heavy-duty propane. Propane is a three-carbon alkane gas (C₃H₈). It is stored under low pressure (operating around 150-200 psi vs. CNG at 3600 psi) inside a tank and is a colorless, odorless liquid. As pressure is released, the liquid propane vaporizes and turns into gas that is used for combustion. It is non-toxic and presents no threat to soil, surface water, or groundwater."

LPG clean burning characteristics allow the engine to have increased service life. There are two types of LPG vehicles: dedicated and bi-fuel. Dedicated LPG vehicles are designed to run only on LPG, while bi-fuel propane vehicles have two separate fueling systems that enable the vehicle to use either LPG or gasoline. A LPG vehicle's power, acceleration, and cruising speed are similar to those of conventionally-fueled vehicles. The driving range for dedicated and bi-fuel vehicles is also comparable. Extra storage tanks can increase range, but the tank size and additional weight affect payload capacity.

LPG has the attention of fleet and transportation managers for a few reasons: economics, energy security and the environment. It is a safe, sustainable, and domestically produced fuel with a robust infrastructure and economic efficiencies. As an approved clean alternative fuel under the Clean Air Act of 1990, LPG qualifies as an alternative fuel eligible for various federal tax incentives and programs. Currently LPG powers more than 350,000 LPG vehicles in the U.S., including school buses, shuttle buses, trucks, vans, and taxis. More than 17 million vehicles run on LPG worldwide. Countries such as South Korea, Poland, Indian, and Japan have a significant percent of their transportation vehicles running on propane autogas. About 40 percent of vehicles in Turkey are fueled by LPG.

There are two different ways vehicles may be powered by propane autogas — dedicated and bi-fuel:

- **Dedicated vehicles**, fueled only by LPG, can be converted from gasoline powered vehicles or can be delivered direct from select original equipment manufacturers.
- **Bi-fuel vehicles**, installed by certified technicians, can run on either LPG or gasoline.

LPG vehicles operate in a similar way as gasoline fueled vehicles. Only a few modifications to the vehicle must be made. The system can be a vapor or a liquid fuel injection. In a vapor injection, propane is vaporized and mixed with combustion air in the intake plenum (enclosed chamber) of the engine. Traditionally, vapor systems are less expensive but result in a loss of power. In a liquid system, liquid LPG is injected directly into each cylinder's intake port. The liquid fuel vaporizes in the cylinder, cooling the air and resulting in no loss of horsepower, torque, or engine performance.

LPG vehicles have the longest driving range of any alternative fuel — more than 250 percent farther than compressed natural gas, about 60 percent farther than methanol, and 25 percent farther than ethanol. This is due to a number of reasons, including the fact that LPG requires a smaller storage vessel than other pressurized alternative fuels to go the same distance.

LPG vehicles meet the same standards for safety as conventionally fueled vehicles. LPG vehicle tanks are constructed from carbon steel under code developed by the American Society of Mechanical Engineers (ASME4196), are 20 times more puncture resistant, and can withstand far more pressure than typical gasoline, methanol, or ethanol tanks. LPG offers more energy per unit mass and has a higher octane rating than gasoline. Propane as an auto fuel does have a slightly lower fuel economy, due to the lower British thermal unit (Btu) content of propane as compared to gasoline — it takes more fuel to create the same amount of power.

Many LPG vehicle fleets have reported two to three years longer service life and extended intervals between required maintenance when compared to their gasoline vehicles. The cleaner burning nature of propane and the lack of carbon build up in the engines leads to this unique benefit of LPG. Zebulon/Zavoli and Ferrellgas customer testimonials prove the on-road performance of propane autogas matches research documented in trials, including the same horsepower, torque, and towing capacity as gasoline-fueled vehicles.

Ease of refueling a LPG vehicle has helped grow the use of this alternative fuel. With thousands of refueling stations across the U.S., a robust national infrastructure is in place to support its implementation as a primary fuel. In addition, some fleets choose to work with their local propane marketer, such as Ferrellgas, to establish a propane autogas refueling infrastructure on-site at little or no cost.

Key Facts about LPG and Other Benefits:

- LPG is the most widely used alternative fuel, with nearly 4 million vehicles worldwide running on propane. More than 350,000 vehicles run on propane in the U.S., according to the U.S. Department of Energy's Alternative Fuels Data Center. Unfortunately, while LPG is a domestic fuel and abundant, numerous other countries are well ahead of the U.S. in adopting the fuel.
- The Alternative Fuels Data Center documents 4,175 public propane refueling stations (more than three times as many as any other alternative fuel), and industry estimates range to 10,000 or more. Companies such as Zebulon Innovations has identified the top technologies world-wide (such as Zavoli LPG vehicle conversion kits) and has imported the leading Italian produced equipment into the U.S for broad adoption via an every growing network of licensed LPG conversion centers throughout the country, including the Des Moines MPO area. Ferrellgas Partners, L.P. is a diversified energy company that, through its operating partnership Ferrellgas, L.P. and subsidiaries, serves propane customers in all 50 states, the District of Columbia and Puerto Rico and provides midstream services to major energy companies in the United States. Operating under the trade name Blue Rhino, the company is also the nation's largest provider of portable tank exchange. Together, Ferrellgas and Zebulon would be pleased to assist the MPO with consulting and operational services to execute a full-scale alternative transportation fuel plan supporting the Mobilizing Tomorrow plan.
- LPG can be used as an alternative fuel in vehicles, and lead to lower vehicle maintenance costs, lower emissions, and fuel costs savings compared to conventional gasoline and diesel. As an example, LPG's low pollution characteristics make it a safe choice for more than 300,000 forklift truck operators and other indoor industrial vehicle operators. LPG is a widely used alternative

fuel. It has substantial reserves due to its dual origins from natural gas processing and crude oil refining. LPG powered passenger cars have about 10% lower tailpipe CO₂ emission than comparable gasoline powered cars. When compared to a diesel car, there is no significant CO₂ emission reduction per mile driven; however, LPG powered vehicles do have substantially lower NO_x emissions than diesel powered vehicles. Governments and various fleets have taken note of the cost savings and environmental benefits as many pursue LPG initiatives to transform their transportation networks.

- LPG is a popular and safe fuel for business and municipal fleets across the United States. More than 80,000 bus, taxi and delivery services, and other fleets are fueled by propane. U.S. automobile and truck manufacturers are producing more and more vehicles equipped with propane-powered engines to keep pace with this growing demand.

Feasibility of Technology and Operational Necessities

LPG can be used in dedicated LPG vehicles or in vehicles converted from gasoline use. The availability of dedicated LPG models is limited, and most LPG powered passenger vehicles have a modified combustion engine. Such converted vehicles normally operate in bi-fuel mode, using either LPG or regular gasoline. Modern bi-fuel vehicles use electronically controlled gas injection systems lowering the NO_x and CO₂ emissions substantially. The advantage of a bi-fuel vehicle is that the car owner is less dependent on a LPG refueling infrastructure with sufficient coverage. In areas, where LPG is not available, regular gasoline can be used. A drawback of the bi-fuel vehicle is that two fueling tanks need to be available, lowering the available space in the vehicle.

Status of the Technology and its Market Potential

Other countries are well ahead of the U.S. in implementing LPG transportation initiatives. The use of LPG as a transport fuel is a well developed technology, and LPG is a widely used alternative fuel. According to an industry organization, the European LPG Association (AEGPL), there are more than 7 million LPG powered vehicles in Europe, and LPG accounts for about 2% of the fuel mix of passenger cars in Europe. AEGPL also estimates that LPG could account for 10% of Europe's passenger car fuel mix by 2020.

Worldwide there are more than 17 million LPG vehicles and over 57,000 refueling sites. Exhibit 1 below shows a summary of the largest markets across the globe for LPG vehicles. LPG also has substantial reserves because of its dual origins of natural gas processing and crude oil refining. Demand between 2000-2013 increased by 60%, but remains concentrated in a small number of markets with the top 5 countries accounting for 53% of world consumption in 2013.

Country	Consumption (thousand tonnes)	Vehicles (thousands)	Refueling sites
Korea	4 450	2 300	1 811
Turkey	2 490	2 394	8 700
Russia	2 300	1 282	2 000
Poland	1 690	2 325	5 900
Italy	1 227	1 700	2 773
Japan	1 202	288	1 900
Australia	1 147	855	3 200
Thailand	922	473	561
China	909	143	310
Mexico	837	535	2 100
Rest of the World	5 723	5 379	28 094
World	22 896	17 473	57 150

Exhibit 1: The ten largest markets for the use of LPG as transport fuel in 2013 (source: WLPGA)

Germany has had various incentive programs for alternative transportation fuels in place since 2003, as part of their environmental legislation. The programs included LPG (propane) however due to the limited timeframe of the programs vehicle conversions and infrastructure was slow to develop. In August of 2006, as part of new energy legislation, the German government extended the tax reductions for LPG transportation fuel until 2018. This has stimulated both the demand for conversions and OEM powered LPG vehicles. Over 400 additional LPG dispensing stations were installed, bringing the number to over 2,000 locations with LPG refueling. The LPG industry has targeted to have over 6,000 stations in place over the next four years. Motorists can save approximately 40% on fuel costs. Conversions are expected to increase from 30,000 units per year to 50,000 per year with an ultimate target of 1,000,000 vehicles operating on LPG by 2020.

How the Technology Could Contribute to Socio-economic Development and Environmental Protection

The primary reason why governments in many countries actively encourage Autogas use is the environment. Autogas is shown in many studies to perform better environmentally than its gasoline and diesel counterparts (WLPGA).

The energy efficiency of modern LPG powered passenger cars is comparable to the energy efficiency of gasoline powered vehicles (JRC,2007). LPG has a lower carbon content (i.e. higher hydrogen-carbon ratio) than gasoline, leading to about 10-12% lower tailpipe CO₂ emission than for gasoline powered cars (RDW,2010). The tailpipe CO₂ emission of LPG powered vehicles are higher than from comparable diesel powered cars.

However, replacing diesel powered passenger cars by modern LPG powered passenger cars can greatly reduce NO_x, CO₂ and particulate matter (PM) emissions (WLPGA, 2011). Figure 3 below shows how Autogas performs well with respect to regulated emissions relative to Gasoline and Diesel under the 'Euro regulations' (developed by the United Nations Economic Commission for Europe (UNECE) and uniformly applied across Europe). The Euro 5 regulation is currently in force.

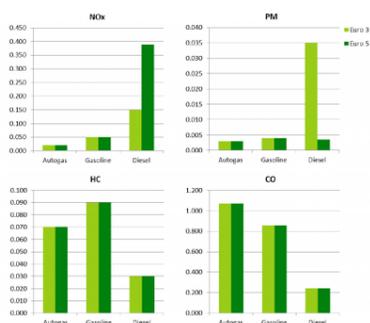


Exhibit 2: Environmental performance of Autogas compared to gasoline and diesel (WLPGA, 2011)

Other benefits of using LPG as an automotive fuel include lower maintenance costs and a longer engine life-time. This is due to LPG's high octane rating and low carbon and oil contamination, which puts less pressure on the engine. Using LPG would also increase energy security as it is a readily available U.S. fuel.

Energy Security

In 2012, the United States imported about 40% of the petroleum it consumed and transportation accounted for more than 70% of total U.S. petroleum consumption. With much of the worldwide petroleum reserves located in politically volatile countries, the United States is vulnerable to supply disruptions.

Fueling vehicles with propane is one way to diversify U.S. transportation fuels. The vast majority of propane consumed in the United States is produced here and distributed via an established infrastructure. Using propane vehicles instead of conventional vehicles reduces U.S. dependence on foreign oil and increases energy security.

Vehicle and Infrastructure Availability

Although propane is widely available in the United States, public vehicle fueling infrastructure is limited. Fleets can work with local propane marketers to establish the fueling infrastructure. Costs will depend on the fuel contract and the complexity of the equipment being installed. The initial infrastructure costs required to expand the sales of LPG in the transport sector, are mainly determined by the investment costs of the LPG refueling infrastructure. The costs incurred relate mainly to service-station storage and dispensing facilities. LPG, however, generally makes use of existing service-station infrastructure for distribution of conventional fuels therefore additional costs for LPG are relatively low compared to other alternative fuels e.g. the cost of installing a tank, pump and metering equipment for autogas alongside existing gasoline or diesel facilities is about one third the cost for equivalent CNG (Compressed Natural Gas) capacity.

The initial infrastructure costs required to expand the sales of LPG in the transport sector, are mainly determined by the investment costs of the LPG refueling infrastructure. Vehicle-conversion costs vary between countries depending upon equipment and local labor costs. Costs vary for the conversion, but typically range between \$3,500 and \$5,000 for a full turn-key bi-fuel conversion that includes the under-the-hood LPG conversion kit, LPG tank and the installation service. Depending on the (road) tax regimes for LPG vehicles and on fuel prices, the financial breakeven point for the initial additional investment for an LPG vehicle is less than a year.

Fuel Economy and Performance

Typically in fleet applications, propane costs significantly less than gasoline and offers a comparable driving range to conventional fuel. Although it has a higher octane rating than gasoline rating (104 to 112 compared with 87 to 92 for gasoline), and potentially more horsepower, it has a lower Btu rating than gasoline, which results in lower fuel economy.

Low maintenance costs are one reason behind propane's popularity for high-mileage vehicles. Propane's high octane and low-carbon and oil-contamination characteristics have resulted in greater engine life than conventional gasoline engines. Because the fuel's mixture of propane and air is completely gaseous, cold start problems associated with liquid fuel are reduced.

Public Health and Environment

Propane is nontoxic, nonpoisonous, and insoluble in water. Compared with vehicles fueled by conventional diesel and gasoline, LPG vehicles can produce lower amounts of some harmful air pollutants and greenhouse gases, depending on vehicle type, drive cycle, and engine calibration.

LPG Fueling Infrastructure Development

Infrastructure availability is a driving force behind the acceptance of any fuel. Fleets depend on being able to locate fuel within a reasonable distance at a competitive price. Converting to LPG vehicles can offer fleets a sound business case.

Types of Infrastructure



Exhibit 3: LPG Storage and Refueling Station

Fuel providers, such as Ferrellgas, and fleets can place LPG dispensers alongside gasoline, diesel, or other alternative fuels. The infrastructure needed is very similar to gasoline and diesel refueling equipment. LPG is brought to the site via a transport truck and put into onsite storage, traditionally above ground. The fueling dispenser is similar to a gasoline dispenser. The main difference is that propane is delivered to the vehicle under pressure so it remains a liquid. When the vehicle tank is full, the dispenser stops automatically, just like gasoline dispensers.

Codes and Safety

There are many safety guidelines that need to be considered when developing infrastructure. This includes the National Fire Prevention Association's [NFPA 58](#) Vehicular Liquefied Petroleum Gas Code, which applies to the design and installation requirements of propane refueling facilities. Your local fire marshal can help with this. In addition, your local propane supplier can help determine the right amount of storage needed to adequately meet vehicle fueling needs.

Cost of Development

Fortunately, propane production, storage, and bulk distribution capabilities already exist across most of the U.S. That means establishing propane fueling infrastructure for vehicle refueling only requires the build-out of dispensing equipment—the storage tank, pump, dispenser, and card reader at a station.

Building a New Station: Many suppliers offer an inexpensive lease of the tank, pump, and dispensing equipment in return for a multi-year fuel supply contract. In these cases the station owner or fleet can obtain an LPG refueling station with no start-up costs. The cost of establishing private infrastructure includes purchasing and installing the necessary equipment for dispensing propane and typically runs from \$30,000 to \$175,000, but varies based on situation and need.

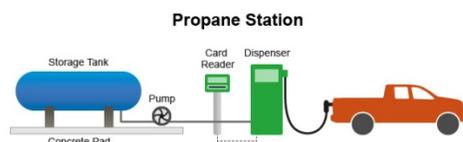


Exhibit 4: LPG/Propane Station

Upgrading Existing Retail Sites

Most LPG vehicles can refuel at existing retail sites that sell propane in small volumes, for example to fill grill canisters and mowers. With adequate demand those sites may upgrade their dispensing equipment to a retail-style metering dispenser with a card reader to accommodate broader vehicle refueling. The pump may also need an upgrade to give vehicles a faster fill rate.

How LPG Vehicles Work

LPG vehicles work much like gasoline-powered vehicles with spark-ignited engines. LPG is stored as a liquid in a relatively low-pressure tank (about 150 pounds per square inch). In vapor injected systems, liquid propane travels along a fuel line into the engine compartment. The supply of propane to the engine is controlled by a regulator or vaporizer, which converts the liquid propane to a vapor. The vapor is fed to a mixer located near the intake manifold, where it is metered and mixed with filtered air before being drawn into the combustion chamber where it is burned to produce power, just like gasoline. LPG injection engines do not vaporize the propane. Instead, it is injected into the combustion chamber in liquid form. Liquid injection systems have also proven reliable in terms of power, engine durability, and cold starting.

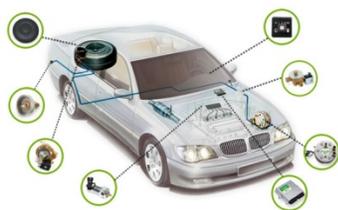


Exhibit 5: LPG Vehicle Conversion Kit

Propane Production and Distribution

Propane is a by-product of natural gas processing and crude oil refining with almost equal amounts of production derived from each of these sources. Most of the propane consumed in the United States is produced in North America and shipped from its production point to distribution terminals.

Production

Propane is produced from liquid components recovered during natural gas processing. These components include ethane, methane, propane, and butane, as well as heavier hydrocarbons. Propane and butane, along with other gases, are also produced during crude oil refining.

Distribution

LPG is shipped from its point of production to bulk distribution terminals via pipeline, railroad, barge, truck, or tanker ship. LPG dealers fill trucks at the terminals and distribute propane to end users, including retail fuel sites.

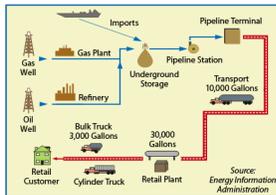


Exhibit 6: Schematic Typical Propane Distribution Route

Together, Ferrellgas and Zebulon would be pleased to assist the MPO with consulting and operational services to execute a full-scale alternative transportation fuel plan supporting the Mobilizing Tomorrow plan. Please do not hesitate to contact us should you have any questions.

Sincerely,

Ken Boyle
Partner
Zebulon Innovations, LLC.

Rick Eggermont
Regional Business Account Manager - Iowa
Ferrellgas, Inc.

Attachment: Case Studies

Case Studies:

UPS Canada:

http://www.exceptionalenergy.com/uploads/Ressources/WLPGA-CASE_STUDIES_UPS_V04_LR.pdf

America's Farmers:

http://www.exceptionalenergy.com/uploads/Ressources/WLPGA%20-%20americas_farmers.pdf

Police Interceptor:

http://www.exceptionalenergy.com/uploads/Ressources/WLPGA%20-%20propane_autogas_police_interceptor.pdf

Autogas in Hong Kong:

http://www.exceptionalenergy.com/uploads/Ressources/WLPGA%20-%20Case%20Study%20-%20Autogas%20HK_V1.pdf

Chicago Shuttle Service:

[http://www.propane.com/uploadedFiles/Propane/On_Road_Fleets/Case Studies and Fact Sheets/Go%20Airport%20Express.pdf](http://www.propane.com/uploadedFiles/Propane/On_Road_Fleets/Case_Studies_and_Fact_Sheets/Go%20Airport%20Express.pdf)

Dekalb County, Georgia Fleet and Infrastructure:

<http://www.allianceautogas.com/wp-content/uploads/2014/07/Dekalb-County.pdf>

Yellow Cab Columbus, Ohio:

http://www.allianceautogas.com/wp-content/uploads/2012/03/YellowCabOfColumbus_Feb20121.pdf

Sears Service Network:

<http://www.automotive-fleet.com/channel/green-fleet/news/story/2012/09/sears-begins-converting-vans-to-propane-autogas.aspx>

PUBLIC COMMENT ON AMENDMENTS

Amendment 1

General Comments:

- Concerned that intersection at 100th Street will increase traffic on 100th Street making neighborhood less safe;
- Concerned about how the removal of the loop ramp will impact adjacent businesses and land uses;
- Concern over truck movements coming off 141 flyover having to merge left to turn left on 54th Avenue;
- Concern over the half-diamond at Meredith causing increased difficulty for southbound 141 traffic to merge onto 80/35.

Submitted Comments:

Pete S. – Urbandale, IA

Just wanted to follow up with a writing with my thoughts about the proposal.

The Oralabor project sounds good--nothing very controversial there.

But the 141 interchange project, in my view, is extremely ill-advised and short-sighted. To think that a project of this scope would be undertaken with absolutely no coordination with the plans for the intersection immediately north at 54th Ave., strikes me as unbelievable.

The ONLY answer to the problems in that area is for the 141 ramps to begin and end NORTH of that intersection. That would greatly reduce the number of cars that have to go through the stoplight at the grade intersection. Omaha has done something like this with stretches of W Dodge Ave.

As the other gentleman who was asking questions with me pointed out--the flyover ramp is likely to cause great difficulty with trucks coming off that ramp trying to merge left to turn left at the grade intersection with 54th Ave. If you land the ramp on the left side of the northbound lanes, that brings another set of problems. Whereas I think the grade intersection could be reconfigured something like my diagram below and work much better.

I also think the half -diamond at Meredith is problematic. It is already somewhat difficult for southbound 141 traffic to merge onto 80/35 at Rider corner. Now you are going to add merging from Meredith on top of that. It seems like an unwise idea to me.

In sum, I oppose the plan. I advocate for a flyover ramp that goes to north of the intersection with 54th Ave. I advocate that the southbound ramp from 141 to 80/35 begin north of that intersection too, and cut down on the cars going through the grade intersection. I advocate for keeping the two loop ramps at the interchange. I think if the flyover was configured as I advocate, then there would be such traffic reduction on those two ramps, they would cease being so problematic. This would obviate the need for a half-diamond at Meredith.

As a frequent motorist in Iowa, I am frustrated that my state often makes a large investment in creating an expressway, and then does nothing to preserve that investment. Over time, the investment is lost completely. It is a huge waste.

I first noticed this in the case of Muscatine, with the 22/61 bypass. That used to be an expressway. Now it is a city street with many stoplights and there is nothing express about it.

This has been repeated numerous times throughout the state.

151 around Cedar Rapids, 163 East of Des Moines, and 141 NW of Des Moines.

I will say there are good examples; it appears to me that the DOT has recognized this problem and is trying to do better on newer projects. I see much better outcomes on things like 75 around Sioux City, 34 around Ottumwa and Fairfield, 20 close to Fort Dodge, and the re-working of 30 through Clinton.

These are examples of efforts to either maintain expressway benefits, or recover them from areas where they were slipping away. Bravo for these.

If some extra effort (admittedly expensive) could be done on the 4 glaring problem areas I have outlined above, I think Iowa's road system would be on track to be the best in the nation.

I know these have thusfar been rather global, state-wide comments, perhaps more appropriate for a state DOT meeting. But two of these 4 problem areas are in the Des Moines metro, and the MPO has a large say in how these problems are addressed.

When the 163 expressway to the southeast part of the state was built a decade ago, I thought it was like heaven. I could get to Burlington for hearings in less than 3 hours.

Now, we have allowed no less than 6 stoplights to pop up on an "expressway" between the Des Moines bypass and SE Polk High School. Some expressway. How did we allow that to happen? How did we let such a huge investment in an expressway turn into just another congested city street?

I must conclude that these things happen because of a complete lack of any plan to preserve the express part of the expressways that were built in these 4 instances. Not enough land was preserved in the original building to keep room for later adding interchanges or frontage roads. Development was allowed too close to the expressway and it is difficult to move that stuff later on when the road becomes congested.

I know that the cost of interchanges is prohibitive. But we either aspire to have expressways or we give up on the idea. I think that with the right planning and budgeting we can have expressways, and that we should. Other states do.

Now let me turn to the 141 expressway, which has been very valuable until recent times, in transporting people from northwest of town into and out of the metro.

There are two significant issues in this area that need to be addressed quickly. The cloverleaf ramp from 80/35 to 141 backs up, and puts slowed or stopped traffic right on the traveled portion of 80/35 during rush hour. This is terribly unsafe. The second issue is that the intersection between 141 and SE 37th st/54th Ave. is very congested, and extremely so during rush hour. The congestion is aggravated by the fact that there is a lot of heavy truck traffic through this intersection, to nearby warehouses and industrial facilities. Trucks take a long time to accelerate through an intersection, and traffic can be held up for several cycles of the stoplight in getting through the intersection.

It seems to me that the various plans on the board right now for the 141 interchange totally fail to address this second problem.

I advocate for the following changes in this corridor to restore 141 to being an expressway (going from north to south):

ONE—The grade crossing at SE 11th st. should be removed. An overpass/underpass at that site for SE 11th could be considered. This crossing never should have been approved, and its appearance a few years ago is one of the dumbest things I have ever seen on an Iowa road.

TWO—The grade crossing at SE 28th should be removed. An overpass/underpass at that site for SE 28th could be considered.

THREE—The grade crossing at SE Grimes Blvd. should be removed with no crossing at all at that site.

FOUR—A standard Diamond interchange should be installed at SE 19th/62nd Ave.

FIVE—Regarding the 141 interchange with 80/35, there should be a flyover ramp from northbound 80/35 to northbound 141. This ramp should end NORTH of the intersection with SE 37th/54th Ave. There could easily be a ramp down to that intersection, but then Quik Trip would have to move its building to the east.

SIX—The ramp from southbound 141 to 80/35 would start NORTH of the intersection with SE 37th/54th Ave. There would still be a ramp from that intersection climbing up to this longer ramp.

SEVEN—Rework the intersection of 141 and SE 37th/54th Ave. This would be a grade intersection with a stoplight, with ramps going overhead as described above. This will require taking a strip of land from Toyota of Des Moines, but that could be done in a way that actually enhances that property in the end.

I brought these thoughts to the meeting last evening, and I thank the MPO for hosting the meeting and answering questions.

I came away with the following impressions:

---that the crossing at SE 11th was asked for by the City of Grimes, and the state gave permission for it.

---that the re-working of the 141/80-35 interchange did not at all take into account solving the problems at 141 & 54th Ave. in being designed.

---the City of Grimes plans to “upgrade” that intersection in the coming years, but the plans have not been drawn up.

---that all of these plans were made before the change in the gas tax.

---the ballpark cost of the chosen alternative is \$50M, with the rough breakdown being \$17M for the 100th street interchange that will be paid for by the City of Urbandale, and \$33M for the rest of the project, to be paid for by the DOT/MPO/Feds.

---That extending the 141 ramps to a place north of the intersection with 54th Ave. was “considered” and then discarded. But no one knew why it was discarded. It is stated that this is an “option for the future” which indicates to me that the work to be done in this project is likely to be torn up and redone in just a few years. But the key is that there appears to be no coordination at all between this large project, and the plans of the City of Grimes for that intersection.

---the planners of this project don’t even yet know which side of the northbound lanes of 141 the flyover ramp will land on.

Adam W.

In response to the MPO input meeting of the above mentioned interchange I have a few comments related to the IJR. You may recall that I own 25 acres on the south edge of this interchange. This includes 15 acres behind McDonald’s and 15 acres between Target and Home Depot.

My largest concern is with the change in property use of my development. We have work with the City of Urbandale to maintain a class A retail environment. With the proposed interchange I will no longer be able to sell to retail tenants. McDonald’s, Kum & Go, Home Depot, and Target have all express that this change could close their store or drastically hurt them. The proposed interchange also decreases the value of the property. This is very discouraging as we have given so much to Urbandale in creating a Class A retail environment. Our family has provided: dirt to the interchange exits, \$500,000 to Rise funding, 1/2 the funding for street in the development, and large amounts to traffic signals to the area.

My other concern lies in the way the flyover connects in to 141. To the west of the 141 & 37th St. intersection are a number of large truck businesses. These include: 3 concrete plants, Beiser lumber, Monarch foundations, FedEx, and the garbage transfer facility. (The IJR study did not include the traffic from FedEx or the Waste Management facility.) As these large trucks exit NB I35/80 to NB 141 and take the flyover they encounter a large slop down to 141 then merging across 2 lanes of traffic in a short period, followed by very short stacking distance at 37th St. This mess will cause the truck traffic to exit elsewhere and further congest the sides streets of the area. Thus not eliminating the traffic blight to the area.

Amendment 2

General Comments:

- No comments received on this amendment.

Amendment 3

General Comments:

- If Veterans Parkway goes in this Great Western Trail corridor, replaced with similar linear park;
- Replacement should be part of cost to develop road ;
- Alternatively, re-route the road corridor; and,
- Next phase of project – get more public input:
 - Warren County Conservation;
 - Bicycle-Pedestrian Roundtable; and,
 - Trail Users.

Submitted Comments:

October 19, 2016

TO: Metropolitan Planning Organization Policy Board

RE: proposed use of Great Western Trail corridor for Veterans Parkway construction

The Iowa Natural Heritage Foundation (as well as members of the MPO Bike-Ped roundtable) recently learned of proposed impact of 1½ to 2 miles of the Great Western Trail for the Veterans Parkway extension in Warren County and we want to inform the MPO Policy Committee of our concerns.

We understand the pressure from the changing urban landscape. But we trust Iowa's public officials and community leaders to make thoughtful changes that preserves the trail experience that draws people to their communities to work, live and raise families.

INHF has major concerns to the proposed use of the Great Western Trail for road right-of way and converting the existing 100' wide greenway into a 10' side path - with no proposed mitigation or consideration of the conservation values that this corridor provides.

We worked hard in the 1980's and 1990s with great public support and trust to acquire and establish the former railroad corridor that has now become the Great Western Trail between

Des Moines and Martensdale. The Great Western Trail is owned and managed by both Warren and Polk County Conservation Boards as a linear park and greenway. Together we worked for years to make this trail. We competed for public grants, raised private donations, collaborated with local businesses, relied on volunteer leaders and put our energy into creating a nature experience for all to enjoy and pass forward to future generations.

The Great Western Trail has become a regional attraction that provides wellness opportunities, recreation, economic

development as well as wildlife habitat and open space for the entire metro.

Our objections center on the permanent loss of public parkway, conservation values and habitat that provide the quality experience that serves the people throughout central Iowa so well today.

We firmly believe that the proposed road alignment will negatively impact the uninterrupted trail experience forever – and will put at risk all the gains and benefits that the trail has come to provide.

This corridor is public parkland that serves the purpose that the public has already paid for.

Also, please be aware that Iowa code entrusts this land to the Warren County Conservation

Board and in a 1973 opinion from the Iowa Attorney General, this corridor cannot be released from ownership for other uses unless there is proven to be “no further need of the land for park purposes” (Iowa Code section 350). We assure you this is not the case for this property.

If city and county leaders are determined to use this proposed route, we request a replacement of the trail corridor with a similar size, quality and experience — and mitigation of the damage being done not just to the corridor and its natural elements but to the safety and attraction that this trail provides today.

We are requesting that local leaders consider the following going forward:

- If the road goes in this corridor, a similar linear park with natural elements and minimal crossings should replace.
- This replacement should be part of the cost of building the road. It is unacceptable to expect the conservation community to build an alternative trail segment at their own trouble and expense. The public already constructed a trail here. Any road project that removes it should also replace it — complete with natural beauty and a substantial separation from vehicular traffic.
- Alternatively, a re-routing of the road away from the Great Western Trail would preserve the trail experience and honor the public land and public funding represented by the trail.
- We ask that the next phase of the project specifically request input from Warren CCB, the Bike-Ped Roundtable and trail users prior to finalizing any design and bid letting, so that area stakeholders can be fully informed of the project.

We request that as area leaders, you do your best to support efforts to retain a quality experience on the Great Western Trail and secure true community input on the design of the road so that we can reach a constructive solution to maintain the corridor and allow for growth. Thank you for your consideration.

Sincerely,

Joe McGovern, President

Iowa Natural Heritage Foundation

Thursday, October 26, 2016

To: Warren County Board of Supervisors, Southwest Connector Interchange and Corridor Location Study Advisory Group, West Des Moines City Manager, Des Moines Area Metropolitan Planning Organization, and Iowa Natural Heritage Foundation

From: Warren County Conservation Board of Directors and Staff

RE: Use of Great Western Trail as right-of-way for Veteran Parkway corridor

In April 2016 the Warren County Conservation Board was made aware that the right-of-way of the Great Western Trail was the preferred corridor for the proposed six-lane Veterans Parkway

(Southwest Connector). This subject was briefly broached to the WCCB in December 2013, but had not been discussed with the Board in the interim. At that time, the Conservation Board was informed that final decisions on alignment were still some time out, possibly many years. Since then, timetables have drastically accelerated and the WCCB finds itself scrambling to ensure that the citizens and interests for which it advocates are adequately represented and protected while this project moves forward.

Resulting from a partnership between the Iowa Natural Heritage Foundation, Polk County Izaak Walton League, the Polk and Warren County Conservation Boards, and many others, the Great Western Trail has provided quality recreational experiences in a linear park for 25 years. It provides green space in an area that has increasing urbanization pressures. The economic benefits of quality recreation facilities, especially trails, are unquestioned. The Warren County Conservation Board is understandably concerned about the affects of Veterans Parkway upon the integrity of the trail and greenway corridor.

Preserving recreational trails and green space for our citizens now and in the future has many benefits. A University of Northern Iowa study in 2011 showed that commuter and recreational bicycling in Iowa generates more than \$400 million in economic activity, resulting in health savings of \$87 million. The National Park Service reviewed multiple studies and found that homes close to recreational trails had 1-6.5 percent increases in value. Another study, done by American Lives, Inc., showed that 77 percent of home buyers and shoppers rated trails and greenways, like the existing Great Western Trail, as essential or very important when purchasing a home.

The Great Western Trail has thousands of visitors every year. WCCB traffic counts of the corridor area in 2015 showed daily traffic is nearly 200 people per day year-round. More than 71,000 people are estimated to use that section of the trail annually. During peak usage in summer 2015, actual counts were 9,918 people in June, 8,840 in July and 8,705 in August.

The Veterans Parkway project will likely provide an economic boost to central Iowa, especially West Des Moines. The WCCB does not dispute this point, nor does it wish to impair the ability of the road project to provide that boost. Unfortunately, being brought late into the planning process, the Conservation Board feels it is imperative to make sure numerous points are addressed before agreeing to allow any use of the trail right-of-way for the road corridor.

Among the concerns of the Warren County Conservation Board:

1. Loss of public parkland. The proposed road will also result in a net loss of green space and habitat. Two miles of 100-foot right-of-way is more than 20 acres of open, quiet, public space. Land, especially in this area of the county, is difficult to obtain and expensive to acquire. These are issues the Conservation Board is aware also affect the acquisition of right-of-way for the proposed road. It is the WCCB's position that asking the people of Warren County to lose this space without mitigation is not acceptable. It is not healthy or sound management for the county to lose parkland that is already held in public trust.
2. User experience. Protecting the quality of the user experience is a high priority for the WCCB. Much of the trail right-of-way in question (all of the corridor outside of Orilla) provides trail users with a beautiful, tree-canopied passage that also provides valuable wildlife habitat. Road construction is almost certain to result in removal of most, or all, of the existing habitat. Construction of the road will, without doubt, reduce that quality. Maintaining as much separation as possible between the road shoulder and the trail surface will help reduce the disruption to the user's experience and should be a priority for everyone. The probability of the trail in close proximity to up to six lanes of traffic for nearly two miles, with the corresponding increase in noise and other distractions, will severely degrade the user experience and the natural character of the corridor.
3. Safety. Building a new six-lane highway in close parallel to an existing trail creates concerns about the safety of trail users. Reasonably, any current trail user should feel as safe and at ease with whatever new alignment is settled upon as they do with the current trail.
4. Crossings. Dove-tailing with safety, there should be no at-grade trail intersections (crossings requiring trail users to navigate the traffic on this road or traffic accessing this road) where the road parallels the Great Western Trail.
5. Accessibility during construction. Every effort should be made to make sure that trail users maintain access to the full right-of-way during the construction process.

Protecting the interests of the Conservation Board's constituency does not have to exclude working for the economic betterment of

Warren County and central Iowa. The Warren County Conservation Board is willing and ready to work to assure a mutually acceptable solution to its concerns and those of road planners, but these concerns must be addressed if the WCCB is to agree to the use of the Great Western Trail right-of-way for this project. Please engage the WCCB as soon as possible to begin the process of preserving this vital, public park corridor during and after this road project.

Sincerely,

Jim Priebe, Director

Warren County Conservation Board

Mark Kreidler, President

Warren County Conservation Board

November 9, 2016

To: MPO Executive Committee and the MPO Policy Board

From: MPO Environmental Roundtable

Yesterday members of the MPO's Environmental Roundtable voted unanimously to express our concern to you about the proposed plan for the Great Western Trail.

We respectfully request that you work to slow down the process to allow for stakeholder input regarding the road alignment.

The Environmental Roundtable requests that the proposed plan to convert the Great Western Trail from a 100' greenway corridor into a 10' side path be further considered and that the proposed Veterans Parkway completely avoid the Great Western Trail (GWT) corridor. We ask that the proposed Veterans Parkway not be approved to be part of the regional long-range plan at this point.

The Great Western Trail plays a distinctive and critical role within the Central Iowa Trails Network. As a National Recreation Trail, the Great Western Trail has a cumulative value to the residents of the entire metropolitan region - reaching far beyond the value of the land alone. It is the only trail with easy, year-round, uninterrupted access to downtown Des Moines. It is also the must-have southern connector of a world-class trails network in Central Iowa. The Great Western Trail launched Central Iowa's "Trails Capital of the World" status.

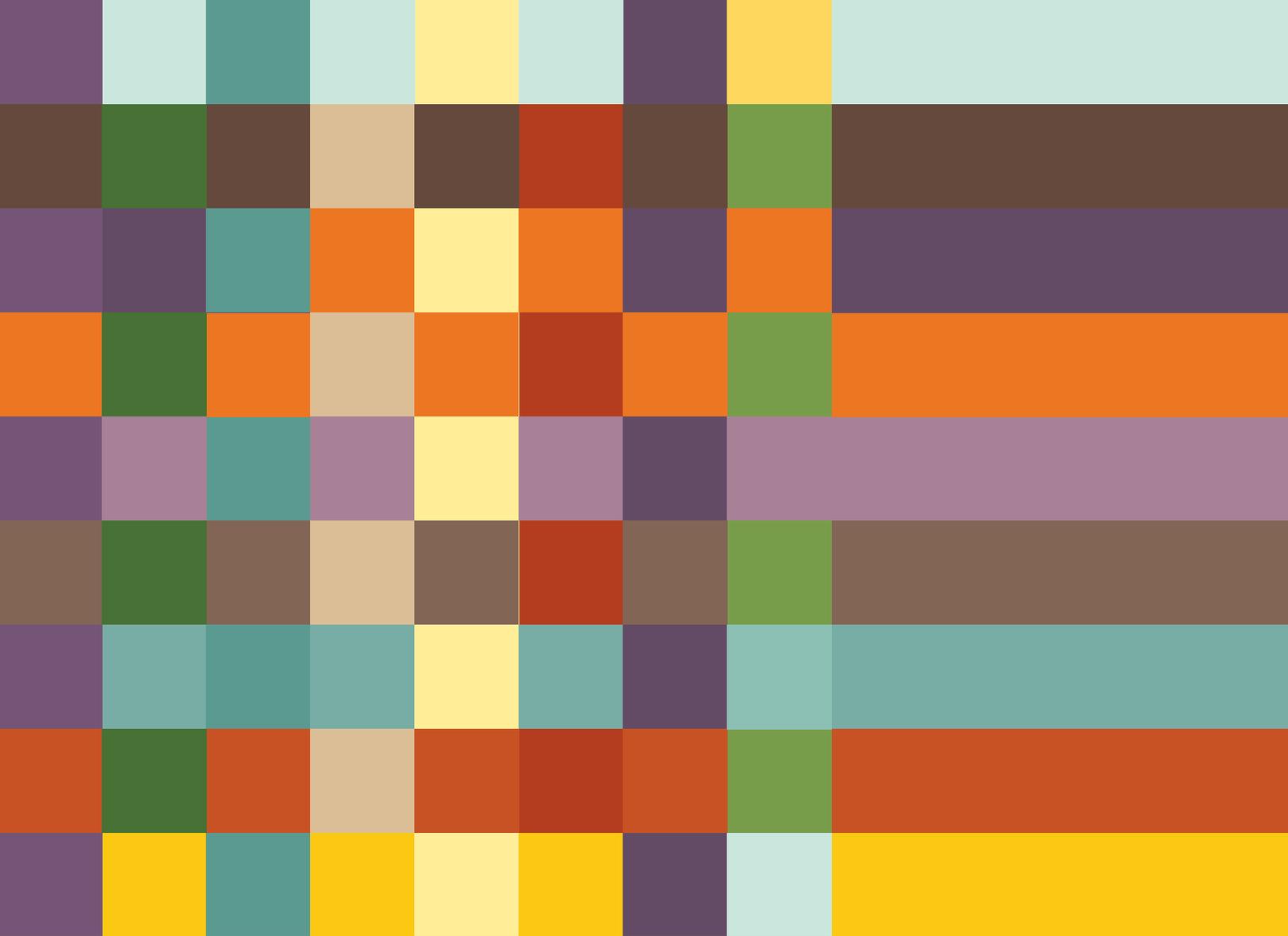
We believe a compromised Great Western Trail would undermine our entire network's national significance and the trail's associated public health, recreation, and economic benefits. The Great Western Trail is so much more than a typical trail - it is a linear park, an essential greenway, and a "puts us on the map" feature for the metro and our state.

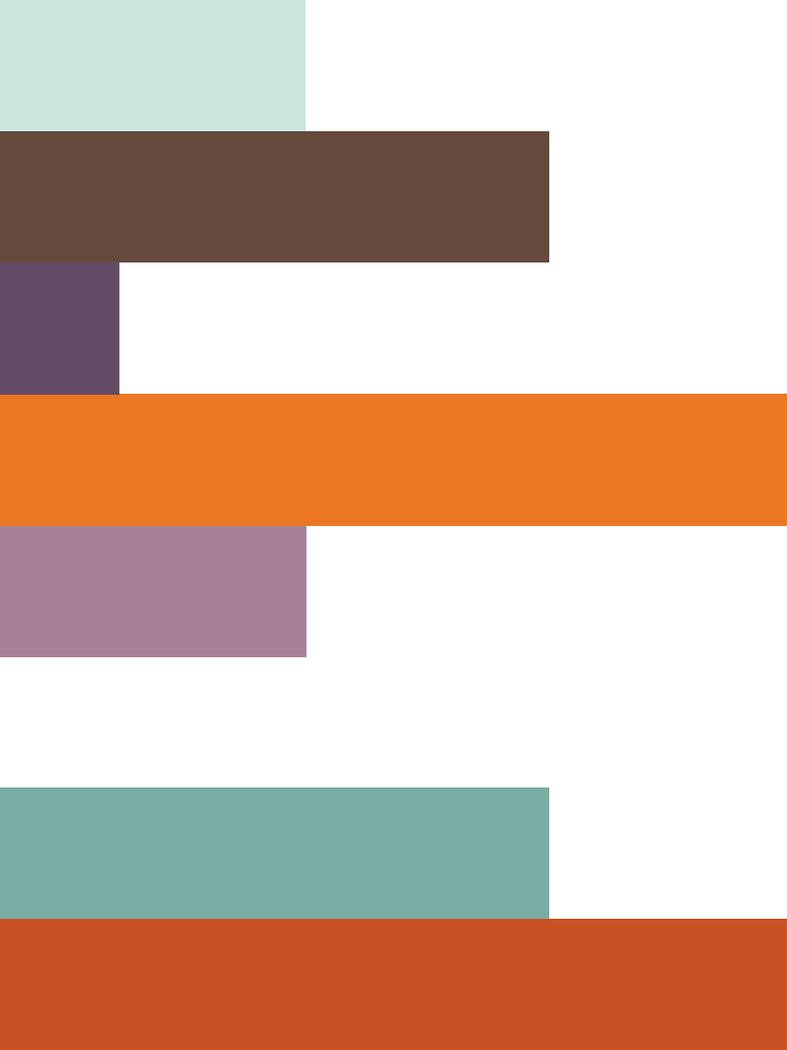
We have confidence that this process can continue to unfold in ways that, by working together, we can find solutions that protect the character and integrity of this much-loved and much-used trail and that honors the values of central Iowans.

Sincerely

Linda D. Appelgate, Interim Chair

MPO Environmental Roundtable





APPENDIX H:
TRAVEL DEMAND
MODEL VALIDATION
AND ANALYSIS

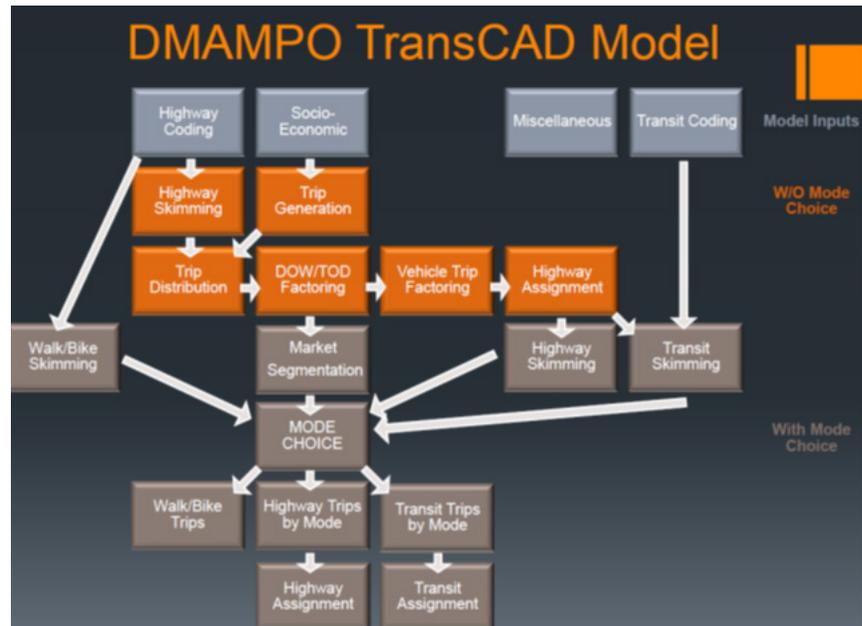
Travel demand models (TDM) simulate current travel conditions and forecast future travel patterns and conditions based on planned system improvements and socio-economic changes. The Des Moines Area MPO utilizes a TDM in assessing the performance of transportation system improvements and identifying impacts within the Metropolitan Planning Area (MPA) such as traffic volumes, traffic delay, transit ridership, and emissions.

Methodology

The Des Moines Area MPO's TDM utilizes TransCAD as the transportation planning computer software package that performs most of the computer processing involved with modeling the transportation system in Greater Des Moines. The Des Moines Area MPO staff ensures the TDM's development includes input and guidance from the Des Moines Area MPO Transportation Technical Committee (TTC), Engineering Subcommittee, and the Iowa Department of Transportation (DOT) modeling staff, as well as guiding documents from the American Association of State Highway and Transportation Officials (AASHTO), the Federal Highway Administration (FHWA), and the Transportation Research Board's (TRB) National Cooperative Highway Research Program (NCHRP).

The Des Moines Area MPO TDM is a four-step modeling process of trip generation, trip distribution, mode choice, and trip assignment. The Des Moines Area MPO TDM structure is shown in Figure H1.

FIGURE H1: TRAVEL DEMAND MODEL STRUCTURE



Survey Data & Socio-Economic Inputs

Survey Data

The Des Moines Area MPO TDM utilizes survey data to establish relationships between input variables and model estimated results. The two surveys utilized in the TDM that provide the most calibration data are the 2001 National Household Travel Survey (NHTS) and the 2010 Des Moines Area Regional Transit (DART) Rider Survey. In addition to survey data, Iowa DOT traffic counts and DART passenger counts are used as validation data to verify model estimates with the observed data.

Socio-Economic Data

The location and amount of population, housing units, employment, and school enrollment are some of the primary determinants of travel demand. The 2050 Growth Scenario, described in Appendix C, consists of three main steps: locating base year 2010 activity, forecasting future year growth at the regional level, and allocating growth to small areas within the region. Transit access procedures make use of the parcel level forecasts but other parts of the transportation modeling process are based on a traffic analysis zone (TAZ) system.

There are 1,164 internal zones, or TAZs, ranging in size from individual blocks in the Central Business District to several square miles in sparsely developed rural areas. The zone system also includes 89 external zones located where roads cross the planning area boundary. These external zones are used to represent travel passing through the Des Moines area and travel between the Des Moines area and other outside locations.

Base Year Data

MPO staff collected data for population and employment that was current as of 2010, which serves as the base year. Population, housing unit, and household information were collected from the US Census Bureau's 2010 Decennial Census. Census population and housing unit counts at the block geographic level were aggregated to the TAZ level for use in the TDM. Census tract level housing unit rates for household size and vehicle availability were applied to TAZ housing units to estimate the distribution of households needed as inputs to the trip generation model. The socio-economic data was obtained as described below, and then visually inspected to confirm data assigned by TAZ.

Zone level employment data using Info USA and Iowa Workforce Development site level employer files were evaluated and found to have significant errors. As a result employment was determined using parcel-based building area to allocate Regional Economic Models, Inc.

(REMI) regional level employment estimates. REMI forecasts were provided by the Iowa Department of Transportation.

MPO staff collected GIS information for commercial and industrial use parcels within Dallas, Madison, Polk, and Warren Counties. Information collected included the parcel size, detailed occupancy, building area, height, and age of the building. The detailed occupancy information was used to categorize each parcel into one of 26 land use categories. Building area was then aggregated to the ten broader categories shown in the table below and a jobs per square foot ratio was applied to each building. Mixed use buildings were identified and employment estimates were developed based on the percentage of each building's area attributed to each use. Employment for each parcel was calculated by taking the building area multiplied by the number of floors multiplied by the jobs per square foot ratio.

Finally, the estimated employment was indexed to the REMI control total for each subarea. This was accomplished by summarizing the estimated employment for each parcel, determining the percentage of the total employment each parcel represents, and then applying that percentage for each parcel to the REMI control total for the parcel's respective subarea. This process changed employment on each parcel slightly yet results in the sum of all parcel employment equaling the REMI employment control total.

School enrollment for the base year by grade level and building was obtained from the Iowa Department of Education for K-12 schools. Enrollment was aggregated to zones by school type (elementary, junior high/middle school, and senior high school) for use in the trip generation model. Enrollment was also collected for the six major post-secondary school campuses: Drake University, the three Des Moines Area Community College campuses, Des Moines University, and Grand View University.

Socio-Economic Forecasts

As a part of this effort a growth forecasting methodology was developed and then used to evaluate four different growth scenarios. After establishing base year data, the 2050 Growth Process distributes REMI regional level population and employment forecasts to parcels and zones in five year time intervals using the following process:

1. Determined employment growth allocations out to 2050 for each subarea following methodology used in The Tomorrow Plan.
2. Determined population growth allocations out to 2050 for each subarea following methodology used in The Tomorrow Plan.
3. Divided subarea control totals by jurisdictions based on an average allocation from The Tomorrow Plan's Scenario 3 and 4.
4. Community representatives worked with MPO staff to assign their allocated growth using the Envision Tomorrow software.
5. Allocated growth to parcels and traffic analysis zones.
6. Applied base year housing unit factors by household size and vehicle availability to occupied housing unit forecasts.

Base year school enrollment is used for future year model applications other than a few K-12 school modifications that have occurred since the 2010 base year.

Trip Generation

The purpose of trip generation is to estimate the number of average daily trips entering and leaving each zone for a forecast year. These trip end forecasts reflect new development, redevelopment, demographic, and economic changes that occur over time.

The model computes person trips, which account for trips by all forms of transportation including automobiles, trucks, taxicabs, motorcycles, public transit, bicycling, and walking. Trips are generated for nine trip purposes: home based work (HBW), home based school (HBSCH), home based shop (HBSH), home based other (HBO), non-home based work (NHBW), non-home based other (NHBO), serve passenger (SPASS), single-unit trucks (SU), and combination unit trucks (COMBO). These trip purposes are designed to group together trips with similar travel patterns.

Each trip has two trip ends and the trip generation model calculates trip ends separately. One end is classified as a trip production and the other end as a trip attraction. Over a 24-hour period, roughly the same number of trips will originate in a zone as are destined there. However, residential zones will generate primarily trip productions while non-residential zones will generate primarily trip attractions. The production/attraction distinction is important for trip distribution.

Trip Distribution

Trip distribution links together person trip productions and attractions from trip generation to determine trip movements between zones. The model produces trip tables that contain a row for each production zone and a column for each attraction zone.

The model is designed to modify trip patterns in response to new land use developments and transportation facility changes. For example,

the opening of a new shopping center would shift trips from other nearby shopping areas to the new development. Another example would be the introduction of mixed-use development. In this case the model would yield shorter trip lengths by recognizing the increased opportunity for interaction between residential and commercial areas in the development.

Mode Choice

Mode choice splits total weekday person trips from the trip distribution step into trips by individual forms of transportation called modes. Mode choice is designed to link mode use to demographic assumptions, highway network conditions, transit system configuration, land use alternatives, parking costs, transit fares, and auto operating costs.

Trip Assignment

Highway assignment is the process of loading vehicle trips between zones onto specific segments of roadway. Trips are apportioned to links based on the time and capacity associated with each link from the highway network. As congestion builds over time, the highway assignment model shifts traffic to adjacent facilities having excess capacity. Similarly, corridors where new roadways or roadway improvements are planned will see traffic diversions to the new facilities from parallel facilities having slower speeds or higher congestion. These shifts in traffic between facilities are a major component of what is perceived of as induced demand.

The transit assignment step determines route, link, and stop level ridership. These transit assignment results are important when evaluating model accuracy and the effectiveness of proposed transit improvements. TransCAD "Pathfinder Transit Assignment" function is used to assign zone-to-zone transit trips to the transit network. Three separate transit assignments are produced for AM peak, PM peak and off-peak periods. These individual assignments are summed to obtain total transit ridership forecasts.

Model Validation

Model calibration and validation takes place throughout the development of the TDM to ensure the model is representative of the transportation network within the region. Model calibration compares base year (2010) estimated traffic volumes and observed traffic counts to determine the accuracy of the model. Differences between model estimated vehicle miles traveled (VMT) and observed VMT determines if the overall traffic for the region is modeled correctly. Additionally, estimated VMT by functional classification can indicate errors in speed assumptions for classifications.

To measure the accuracy of traffic assignment the root mean square error (RMSE) and percent RMSE (%RMSE) are used to estimate the average error between the observed and modeled traffic volumes on links with traffic counts. Figure H2 shows the %RMSE by functional classifications in the MPO model.

FIGURE H2: SYSTEM WIDE RMSE BY FUNCTIONAL CLASSIFICATION

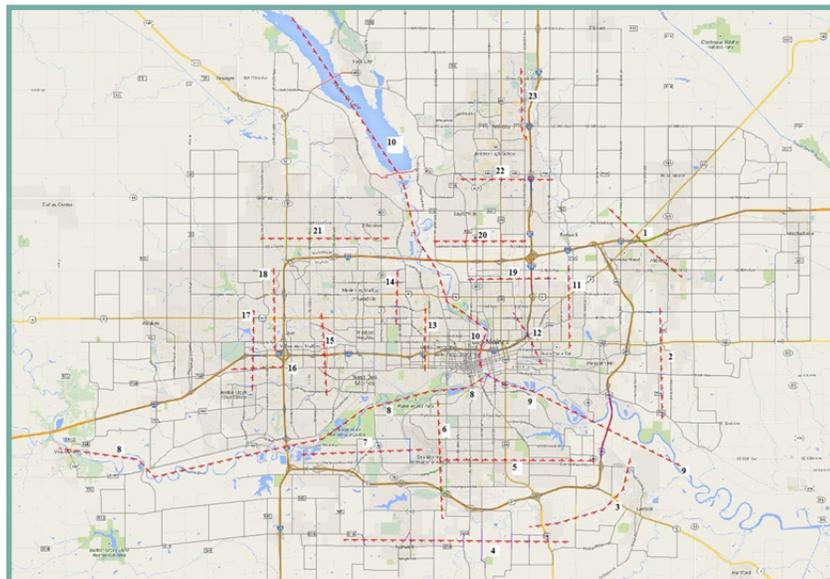
Functional Classification	Number of Observations	Sum of Count	Sum of Flow	% Difference	%RMSE
Freeway	284	8,295,625	8,136,611	-2	9
Freeway Ramp	28	247,463	238,498	-4	13
Principal Arterial	320	6,207,383	5,924,369	-5	22
Minor Arterial	721	6,721,466	5,908,910	-12	42
Major Collector	559	1,930,984	1,562,924	-19	67
Minor Collector	96	103,872	104,115	0	141
Local	131	90,385	55,678	-38	124
On/Off Ramp	208	1,005,706	1,115,814	11	53
All Classes	2347	24,602,884	23,046,919	-6	30

An additional measure used to calibrate the TDM is a screenline analysis. For the MPO model 23 screenlines were identified for model refinement and validation. Screenlines produce a flow-to-count ratio, RMSE, and %RMSE at each location. Figure H3 shows the results for the 23 screenlines used for the MPO model. Figure H4 shows the location of the 23 screenlines utilized in the calibration of the model.

FIGURE H3: FLOW-TO-COUNT RATIO & RMSE BY SCREENLINE

SCREENLINE	MODEL FLOW	TRAFFIC COUNT	FLOW/COUNT	RMSE	%RMSE
1	62753	71874	0.9	3098.0	26
2	16777	17948	0.9	1293.6	14
3	22814	20531	1.1	1329.5	13
4	38608	36510	1.1	2251.7	25
5	73143	75159	1.0	1608.8	15
6	44591	56629	0.8	2121.6	30
7	14303	12500	1.1	1803.0	14
8	126718	122811	1.0	2543.5	12
9	27818	25995	1.1	686.0	8
10	247268	244043	1.0	2856.3	14
11	39408	48009	0.8	3938.1	25
12	69159	66549	1.0	1057.6	5
13	133632	133004	1.0	785.6	5
14	49352	49713	1.0	2696.5	27
15	101050	104738	1.0	1569.3	6
16	38165	47200	0.8	4532.3	19
17	108406	125668	0.9	4393.9	21
18	49251	51475	1.0	2140.6	12
19	94628	92738	1.0	2139.7	14
20	42368	38504	1.1	2239.9	29
21	74070	74151	1.0	3132.8	21
22	109105	109821	1.0	4013.7	18
23	21825	20531	1.1	1594.2	16

FIGURE H4: SCREENLINE LOCATIONS



Model Analysis

Analysis of the TDM outputs for fiscally constrained projects in each of the three project timeframes included in Appendix E was completed to compare a no-build scenario and a build scenario. It was assumed that for each project timeframe the no-build scenario includes all fiscally constrained projects with estimated build years prior to the first year of the project timeframe. For example, the no-build scenario for the 2025-2034 timeframe is modeled with the fiscally constrained projects through the 2015-2024 timeframe.

For each of the project timeframes the percent of roadway miles by level-of-service (LOS) and estimated VMT were compared to estimate the impact the fiscally constrained projects would have on future traffic in the MPO planning area.

Model Year: 2010

Model Year 2010 is the base year for the MPO TDM. Figure H5 shows the base year network by estimated LOS. Figure H6 displays the estimated roadway miles by LOS and the estimate daily and annual VMT for the base year.

FIGURE H5: MODELED LEVEL OF SERVICE FOR MODEL YEAR 2010

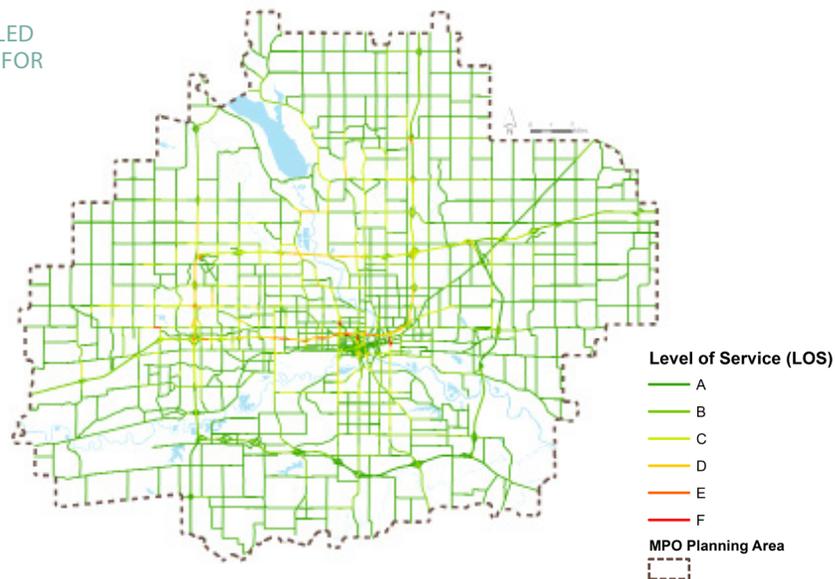


FIGURE H6: LEVEL OF SERVICE & VMT FOR MODEL YEAR 2010

Level of Service	Miles	Percent
A	996.3	67.5%
B	315.5	21.4%
C	131.4	8.9%
D	27.0	1.8%
E	4.0	0.3%
F	1.2	0.1%
Total	1475.3	100%
VMT/day	10,259,374.1	
Annual VMT	3,744,672,013.7	
Daily VMT/Capita	21.36	

Model Year: 2015-2024

Model year 2015-2024 utilizes socio-economic data for the year 2020 to estimate traffic on the no-build and build scenarios shown in Figures H7 and H8. The build scenario for the 2015-2024 timeframe represents the change in LOS and VMT based on the completion of fiscally constrained projects identified for the timeframe. Figure H9 displays the estimate roadway miles by LOS and the estimate daily and annual VMT for the years 2015-2024. In both the no-build and build scenarios, the percent of roadways with a LOS of E or F remains below the goal of 10 percent.

FIGURE H7: MODELED LEVEL OF SERVICE FOR MODEL YEARS 2015-2024: NO-BUILD

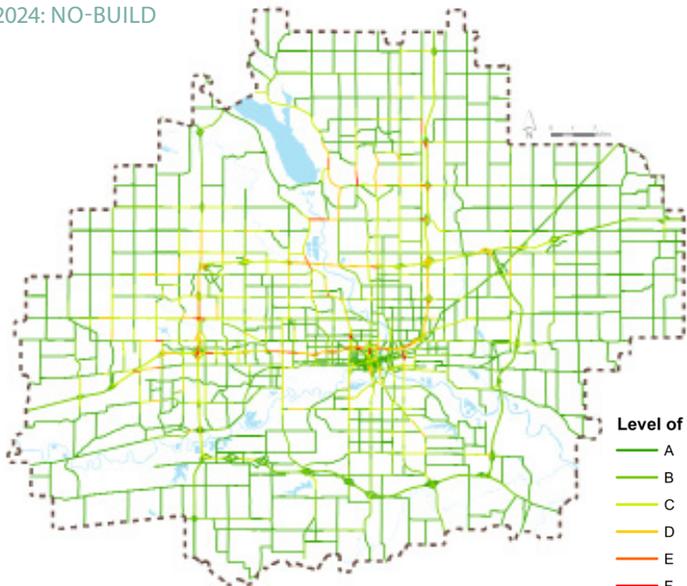


FIGURE H8: MODELED LEVEL OF SERVICE FOR MODEL YEARS 2015-2024: BUILD

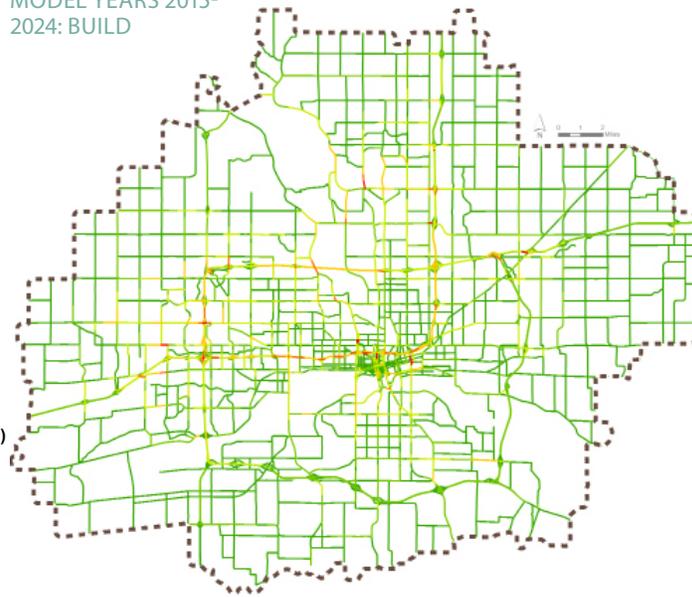


FIGURE H9: LEVEL OF SERVICE & VMT FOR MODEL YEARS 2015-2024

Level of Service	No-Build		Build	
	Miles	Percent	Miles	Percent
A	845.1	57.2%	872.7	58.4%
B	373.4	25.3%	373.6	25.0%
C	189.2	12.8%	177.0	11.8%
D	56.7	3.8%	56.5	3.7%
E	10.8	0.7%	9.9	0.6%
F	2.4	0.1%	2.4	0.1%
Total	1477.5	100%	1492.1	100%
VMT/day	13,488,664.0		13,477,142.7	
Annual VMT	4,923,362,705.8		4,919,157,086.0	
Daily VMT/Capita	24.18		24.16	

Model Year: 2025-2034

Model year 2025-2034 utilizes socio-economic data for the year 2030 to estimate traffic on the no-build and build scenarios shown in Figures H10 and H11. The build scenario for the 2025-2034 timeframe represents the change in LOS and VMT based on the completion of fiscally constrained projects identified for the timeframe. Figure H12 displays the estimate roadway miles by LOS and the estimate daily and annual VMT for the years 2025-2034. In both the no-build and build scenarios, the percent of roadways with a LOS of E or F remains below the goal of 10 percent.

FIGURE H10: MODELED LEVEL OF SERVICE FOR MODEL YEARS 2025-2034: NO-BUILD

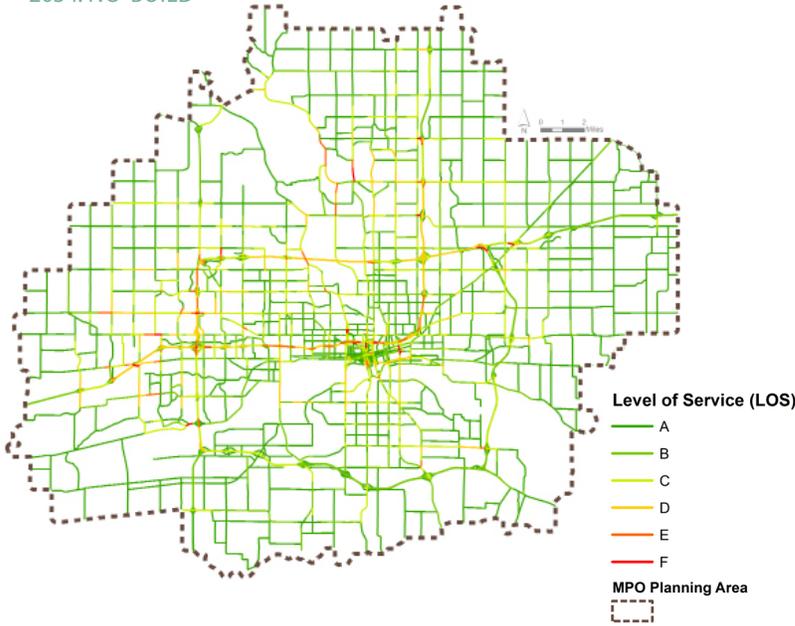


FIGURE H11: MODELED LEVEL OF SERVICE FOR MODEL YEARS 2025-2034: BUILD

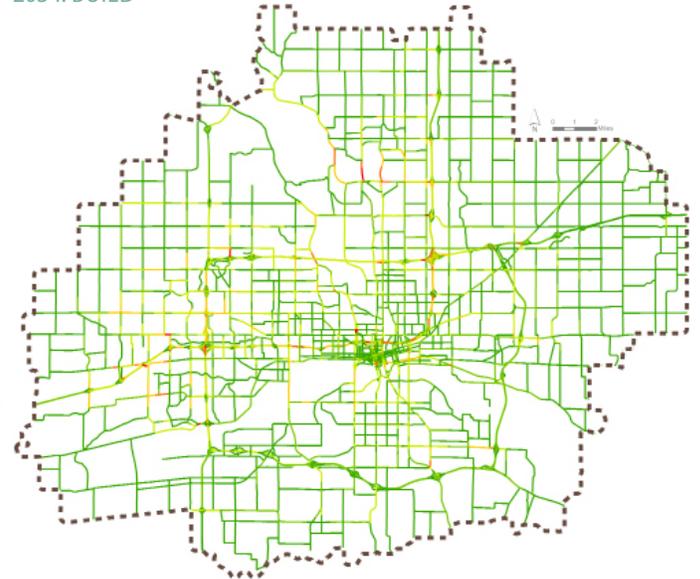


FIGURE H12: LEVEL OF SERVICE & VMT FOR MODEL YEARS 2025-2034

Level of Service	No-Build		Build	
	Miles	Percent	Miles	Percent
A	790.1	52.9%	836.6	55.8%
B	370.2	24.8%	372.9	24.8%
C	223.0	15.0%	205.8	13.7%
D	83.7	5.6%	64.7	4.3%
E	19.3	1.4%	15.4	1.0%
F	4.5	0.1%	3.9	0.2%
Total	1490.8	100%	1499.3	100%
VMT/day	13,463,640.9		14,918,833.7	
Annual VMT	4,914,228,929		5,445,374,301.0	
Daily VMT/Capita	21.91		24.28	

Model Year: 2035-2050

Model year 2035-2050 utilizes socio-economic data for the year 2050 to estimate traffic on the no-build and build scenarios shown in Figures H13 and H14. The build scenario for the 2035-2050 timeframe represents the change in LOS and VMT based on the completion of fiscally constrained projects identified for the timeframe. Figure H15 displays the estimate roadway miles by LOS and the estimate daily and annual VMT for the years 2035-2050. In both the no-build and build scenarios, the percent of roadways with a LOS of E or F remains below the goal of 10 percent.

FIGURE H13: MODELED LEVEL OF SERVICE FOR MODEL YEARS 2035-2050: NO-BUILD

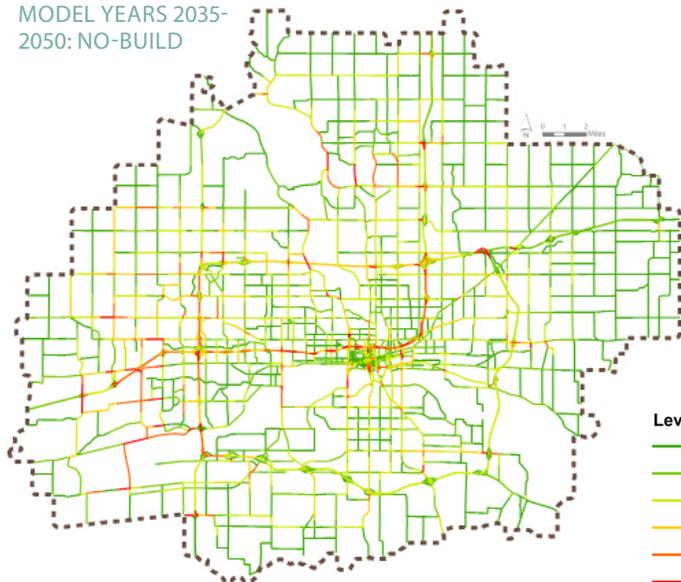


FIGURE H14: MODELED LEVEL OF SERVICE FOR MODEL YEARS 2035-2050: BUILD

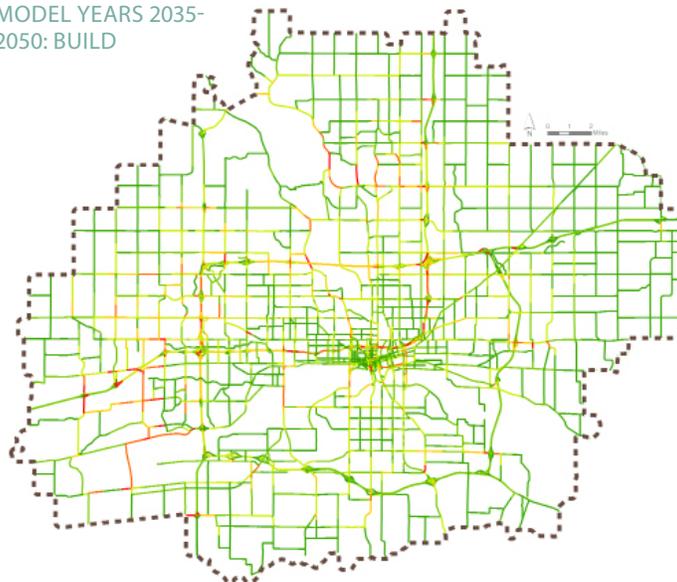
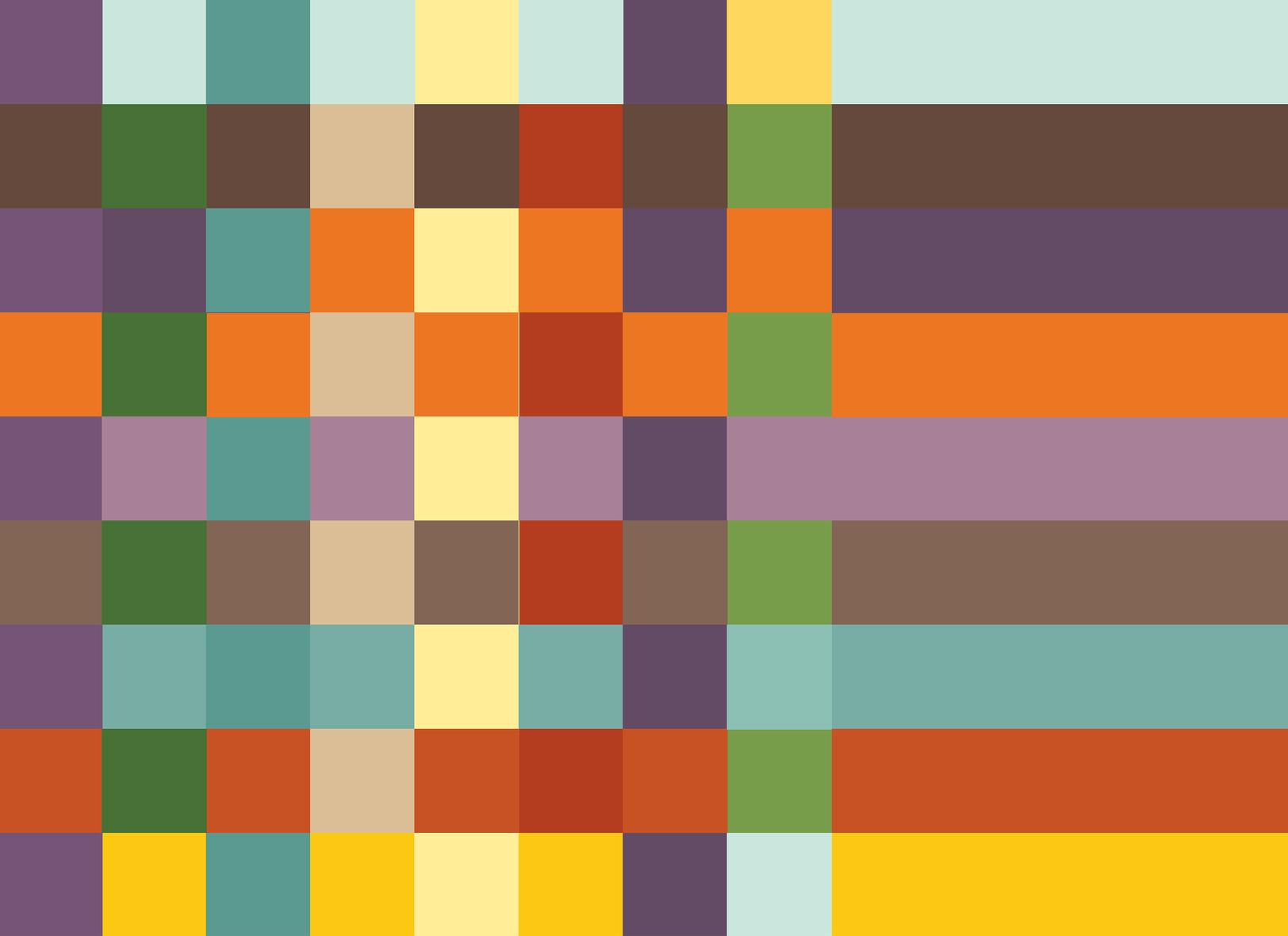
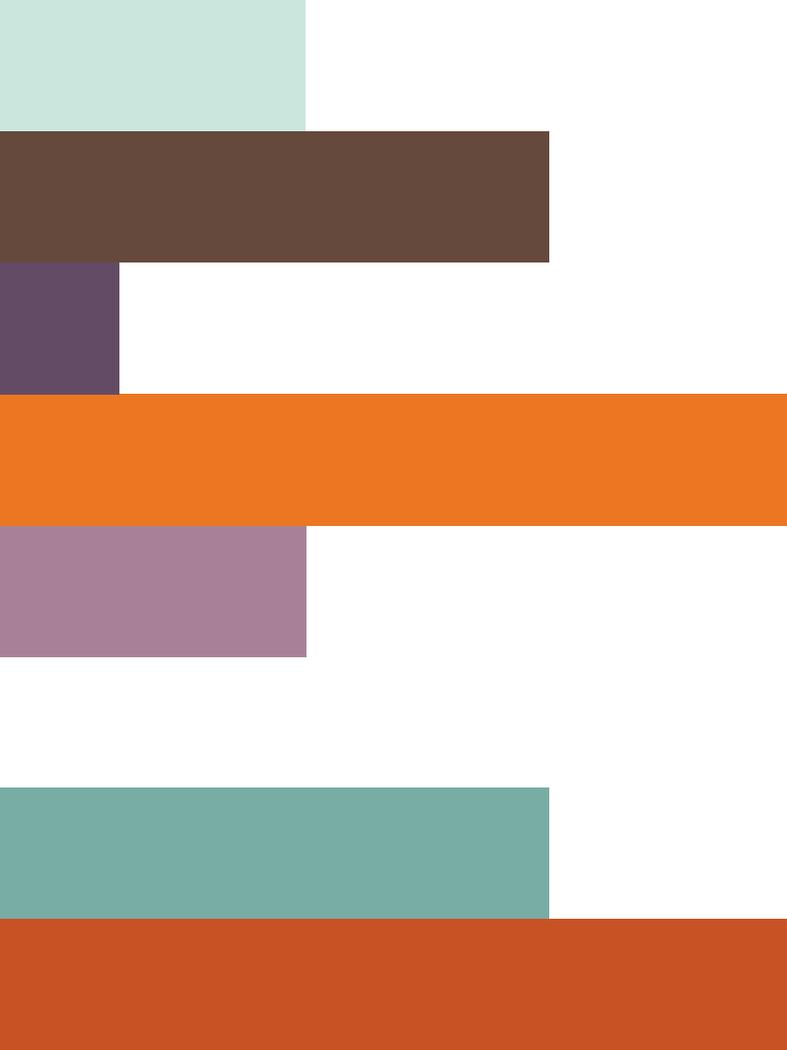


FIGURE H15: LEVEL OF SERVICE & VMT FOR MODEL YEARS 2035-2050

Level of Service	No-Build		Build	
	Miles	Percent	Miles	Percent
A	610.2	40.7%	634.9	42.3%
B	368.7	24.6%	417.0	27.8%
C	315.8	21.0%	268.3	17.9%
D	114.7	7.6%	110.6	7.4%
E	64.1	4.2%	48.5	3.2%
F	24.6	1.6%	21.8	1.5%
Total	1498.1	100%	1501.1	100%
VMT/day	18,845,362.4		18,899,150.3	
Annual VMT	6,878,557,276		6,898,189,860	
Daily VMT/Capita	25.10		25.16	





APPENDIX I: AMENDMENTS AND REVISIONS

AMENDMENTS AND REVISION PROCESS

The MPO considers the following criteria when amending and revising Mobilizing Tomorrow, and believes these criteria to be consistent with Federal and Iowa DOT requirements.

Amendments

The MPO considers proposed changes that meet any of the following criteria as amendments to Mobilizing Tomorrow:

- Changes in socioeconomic projections;
- Addition of a project to the plan in any year increment;
- Movement of a project between any year increment in the plan; or,
- Major changes in a project's scope, where the recalculated project costs increase federal funding by more than 30 percent or increase federal funding by more than \$2,000,000 from the original amount.

If the MPO considers a change to the plan to be an amendment, the MPO must formally vote on the requested change and follow the public participation process identified in the MPO's Public Participation Plan, including:

- Proposed amendments are made available for review on the MPO website
- Provide a 45-day public comment period and issue an announcement of the public meeting approximately 30 days prior to the scheduled public input meeting;
- Hold at least one public input meeting to receive public comment prior to MPO approval; and,
- Legal notice published one week prior to the public meeting.

If the MPO approves an amendment, the MPO would notify the Iowa DOT, FHWA, and FTA and update the plan document accordingly. Generally, plan amendments take a minimum of 60 days to process.

Revisions

The MPO considers proposed changes that meet any of the following criteria as revisions to Mobilizing Tomorrow:

- Changes to any of the modal elements;
- Editorial revisions of text and/or graphics;
- Removal of a project from the plan in any year increment; or,
- Minor changes in a project's scope where the recalculated project costs increase federal funding by less than 30 percent or increase federal funding by less than \$2,000,000 from the original amount.

If the MPO considers a change to Mobilizing Tomorrow to be a revision, the MPO processes the revision administratively. Following a thorough review of the proposed revision, the MPO staff:

- Processes the revision by notifying the Iowa DOT, FHWA, and FTA;
- Notifies the MPO's committee representatives of all revisions through their monthly meeting agendas.

Generally, revisions take a minimum of 30 days to process.

OVERVIEW OF AMENDMENTS

Since the Mobilizing Tomorrow's (HY 2050 MTP) adoption in November 2014, the Des Moines Area MPO has made periodic amendments to the plan. Appendix H outlines the amendment process and documents the approved amendments.

Amendment 1

Amendment 1, approved by the Des Moines Area MPO in October 2015, made the following changes to Mobilizing Tomorrow:

SE Oralabor Road Improvements (LRTP# 572)

Added the Iowa Department of Transportation and the City of Ankeny's SE Oralabor Road operational and capacity improvements in the amount of \$3,200,000. The project includes operational and capacity improvements throughout the SE Oralabor Road corridor from SE Peachtree Drive to SE Creekside Drive. The project includes improvements at both I-35 exit ramps, the reconfiguration of the SE Oralabor Road and SE Delaware Avenue intersection, and traffic signal improves. The project was added to the Horizon Year (HY) 2015-2024 timeframe.

Reconfigure I-35/80 Interchange at IA 141 (LRTP# 316)

Amended the Iowa Department of Transportation and City of Urbandale's Reconfigure I-35/80 Interchange at IA 141 project to remove the Collector-Distributor system from the Horizon Year (HY) 2015-2024 timeframe, and increase the project cost from \$21.9 million to \$33.3 million.

Amendment 2

Amendment 2, approved by the Des Moines Area MPO in August 2016, made the following changes to Mobilizing Tomorrow:

Des Moines Rail Port Facility

Since 2014, the MPO has worked with the City of Des Moines to develop a rail port on the east side of the city. The project has progressed since the completion of Mobilizing Tomorrow and staff is proposing to add some additional language to the rail section of the plan that includes project details and estimated costs. The changes were made to pages 110-111 of the plan.

Travel Demand Model Validation and Analysis Appendix

At the request of the FHWA, staff developed an additional appendix to Mobilizing Tomorrow to provide an overview of the travel demand modeling process used by the MPO in the development and evaluation of fiscally constrained projects included in Mobilizing Tomorrow.

The appendix describes the four-step modeling process used to forecast future traffic volumes utilizing socio-economic forecasts developed for the Tomorrow Plan and modified for Mobilizing Tomorrow.

Amendment 3

Amendment 3, approved by the Des Moines Area MPO in November 2016, made the following changes to Mobilizing Tomorrow:

Veterans Parkway Project

In September, the MPO staff proposed amending Mobilizing Tomorrow to move the Veterans Parkway project from Mobilizing Tomorrow's illustrative project list into the fiscally constrained project list. Staff recommended adding the project after consulting with the Federal Highway Administration (FHWA). FHWA noted that even though the project is using local funds, Veterans Parkway is a major regional project that will impact regional travel movements. Therefore, the project should be in the fiscally constrained plan to comply with US Code, which states that an MPO's long-range transportation plan shall include "existing and proposed transportation facilities...giving emphasis to those facilities that serve important national and regional transportation functions." The amendment includes adding projects 448, 449, 450, 451, 518, 524, 529, and 530 to the fiscally constrained project list.

Downtown Des Moines Bridges

In July, the City of Des Moines announced that it would receive an \$8 million TIGER grant for their Bridges to Opportunity: Des Moines' Community Connection project, to reconstruct and replace several bridges in downtown Des Moines. The bridges include Locust Street, Court Avenue, Scott Street, and SW 1st Street. The Locust Street Bridge is currently in Mobilizing Tomorrow. The amendment includes adding the other three bridges into the fiscally constrained list of projects for the 2015-2024 timeframe.

Changes to Plan Document

The following section documents the actual changes made in the plan document based on each of the following approved amendments:

Amendment 1

Figure E9: Fiscally-Constrained Iowa DOT Roadway Projects - 2015-2024 on page 225-26 was updated to include project #572, and the project description and cost were updated for project #316.

The following figures were updated to include a \$5,000,000 increased DOT revenue in the 2015-2024 timeframe based on the gas tax increase that passed in February 2015:

Figure 3.5: Iowa DOT Funding Projections (p.76);

Figure 3.9: Submitted Project Summary (p.79);

Figure D11: Iowa DOT Projected Funding Through HY 2050 (p.208); and,

Figure E2: Fiscal Capacity of Fiscally-Constrained Projects (p.216).

Amendment 2

Added additional language on the Des Moines Rail Port to pages 110-111.

Added Travel Demand Model Validation and Analysis Appendix .

Amendment 3

Added Table E5A to page 220 to include the Bridges of Opportunity (600), Veterans Parkway (601), and Grand Prairie Parkway (602) projects. Also added footnotes describing the reason for adding each of these projects on the bottom of page 220.

Added footnote to page 242 noting that projects 448,449,450, and 451 were moved to table E5A on page 220

Added footnote to page 245 noting that projects 518,524,529, and 530 were moved to table E5A on page 220

