NOTICE OF MEETING

Des Moines Area Metropolitan Planning Organization (MPO)
Transportation Technical Committee (TTC)

9:30 a.m., Thursday, August 7, 2014
Des Moines Area MPO Burnham Conference Room

TENTATIVE AGENDA

1. Call To Order
2. VOTE: Approval of Agenda
3. VOTE: Approval of Meeting Minutes ............................................................... Page 2
   - Approve the July 3, 2014, TTC meeting minutes.
4. PRESENTATION: Natural Areas Map ............................................................... Page 5
   - A presentation on a new online mapping tool to view environmentally sensitive areas.
5. REPORT and VOTE: Electric Vehicle Infrastructure Study ............................... Page 6
   - Report and vote to approve the final draft of the Electric Vehicle Infrastructure Study.
6. REPORT and VOTE: On-Street Bike Facility Feasibility Study ......................... Page 7
   - Report and vote to approve the final draft of the On-Street Bike Facility Feasibility Study, which identifies opportunities for on-street bike lanes throughout the MPO.
7. REPORT and OPTIONAL VOTE: Travel Demand Model .................................... Page 8
   - Discussion regarding the status of the new travel demand model; consider approval.
8. REPORT and OPTIONAL VOTE: 2050 Growth Scenario ..................................... Page 9
   - Discussion regarding the 2050 growth scenario; consider approval.
9. REPORT and OPTIONAL VOTE: Fiscal Year 2015 Unified Planning Work Program – Amendment 1 ............................................................ Page 10
   - Report on an amendment to the Unified Planning Work Program to add the Rail Port Study as a special project.
    - Report on the upcoming Travel Time Survey for the region.
11. REPORT: Mobilizing Tomorrow Update .......................................................... Page 13
    - Report on the development of Mobilizing Tomorrow, the MPO’s next long-range transportation plan.
12. REPORT: Iowa Clean Air Attainment Program Schedule ................................ Page 14
    - Report on Fiscal Year 2015 Iowa Clean Air Attainment Program (ICAAP) schedule.
13. INFORMATION: Des Moines Regional Research, Stats, & Data Hub ................. Page 15
14. Other Non-Action Items of Interest to the Committee
15. Next Meeting Date
   - 9:30 a.m., Thursday, September 4, 2014, Des Moines Area MPO Office.
16. Adjournment
ISSUE: Approval of Meeting Minutes

VOTE: Consider approval of the July 3, 2014, MPO Transportation Technical Committee meeting minutes.

BACKGROUND:

The minutes of the July 3, 2014, MPO Transportation Technical Committee (TTC) meeting are enclosed on the following pages.

RECOMMENDATION:

Approve the minutes of the July 3, 2014, MPO TTC meeting.

STAFF CONTACT:

Jennifer Ratcliff, jratcliff@dmampo.org; (515) 334-0075.
MEETING MINUTES
Des Moines Area Metropolitan Planning Organization (MPO)
Transportation Technical Committee (TTC)
9:30 a.m., Thursday, July 3, 2014
Des Moines Area MPO Burnham Conference Room

The MPO TTC held a meeting at 9:30 a.m., on July 3, 2014, at the Des Moines Area MPO Burnham Conference Room. Before the meeting, the MPO staff emailed agenda packets to the TTC representatives and posted the agenda at the MPO office at 4:05 p.m., June 26, 2014.

Representatives Present:

Vern Villey II, City of Altoona
John Shaw, City of Altoona
Eric Jensen, City of Ankeny
Paul Moritz, City of Ankeny
John Peterson, City of Ankeny
Lori Dunham, City of Bondurant
Jeff Schug, City of Carlisle
Matt McQuillen, City of Clive
Jim Hagelie, City of Clive
Mike Ludwig, City of Des Moines
Jeb Brewer, City of Des Moines
Pamela Cooksey, City of Des Moines
Jerry Byg, City of Grimes
David Wilwerding, City of Johnston
Dave Cubit, City of Johnston
Tom Leners, Madison County**
Wayne Patterson, City of Mitchellville
Luke Parris, City of Norwalk
Ben Champ, City of Pleasant Hill
Kurt Bailey, Polk County
Bret VandeLune, Polk County
Annika Schilke, City of Urbandale
Dave McKay, City of Urbandale
Paul Dekker, City of Urbandale
David Carroll, Warren County
Joe Cory, City of West Des Moines
Ben Landhauser, City of Waukee
Brad Deets, City of Waukee
Kara Tragesser, City of West Des Moines

Representatives Absent:

Anthony Bellizzi, City of Cumming**
Murray McConnell, Dallas County
Bryan Belt, Des Moines International Airport
Jim Tishim, Des Moines Regional Transit Authority
Julia Castillo, Heart of Iowa Regional Transit Mike Clayton, Iowa Department of Transportation*
Chuck Burgin, City of Indianola**
Dennis Dietz, City of Polk City
Duane Wittstock, City of West Des Moines
Sheena Danzer, City of Windsor Heights
Tracy Troutner, Federal Highway Administration*
Mark Bechtel, Federal Transit Administration*

* Non-Voting, Advisory Representative
** Non-Voting, Associate Representative

Others Present:

Steve Eggleston, HUD
Josh Hellyer, PCHTF

Staff Present:

Todd Ashby, Executive Director
Jennifer Ratcliff, Executive Assistant
Dylan Mullenix, Principal Transportation Planner
Nathan Goldberg, Senior Transportation Planner
Bethany Wilcoxon, Senior Transportation Planner
Aaron Bartling, Associate Transportation Planner
1. **Call to Order**

   MPO TTC Chair Ben Champ recognized a quorum and called the July 3, 2014, meeting to order at 9:30 a.m.

2. **Approval of Agenda**

   **MOTION:** A motion was made and seconded to approve the MPO TTC’s July 3, 2014, meeting agenda with amendment to item 5.

   **MOTION CARRIED UNANIMOUSLY**

3. **Approval of Meeting Minutes**

   **MOTION:** A motion was made and seconded to approve the MPO TTC May 1, 2014 meeting minutes.

   **MOTION CARRIED UNANIMOUSLY**

4. **Housing Tomorrow**

   Presentation: Greater Des Moines’ first regional plan for affordable housing; discussion on item 4

   (Ben Landhauser entered at 9:33 am)
   (Brad Deets entered at 9:33 am)
   (Vern Willey entered at 9:35 am)

5. **Federal Fiscal Year 2015 – 2018 Transportation Improvement Program Final Draft**

   **MOTION:** A motion was made and seconded to approve the final draft of the *Federal Fiscal Year 2015-2018 Transportation Improvement Program*

   **MOTION CARRIED UNANIMOUSLY**

6. **Iowa Clean Air Attainment Program Schedule**

   MPO staff presented; discussion on item 6

7. **Mobilizing Tomorrow Update**

   MPO staff presented; discussion on item 7

8. **Construction Timing Management**

   MPO staff presented; discussion on item 8

9. **Other Non-Action Items of Interest to the Committee**

10. **Next Meeting Date**

    9:30 a.m., on Thursday, August 7, 2014, Des Moines Area MPO Burnham Conference Room.

11. **Adjournment**

    **MOTION:** A motion was made and seconded to adjourn the MPO TTC’s July 3, 2014; TTC Chair Champ adjourned the meeting at 9:50 a.m.

    **MOTION CARRIED UNANIMOUSLY**
ISSUE: Natural Areas Map

PRESENTATION: Presentation on the Natural Areas Map from the Environment Roundtable.

BACKGROUND:

The MPO’s new Environment Roundtable assisted staff in developing a natural areas map to inform quality growth and conservation decisions by local governments. Data layers in the map include:

- Wetlands
- Floodways
- Floodplains
- Critical habitat
- Trails
- Parks
- Hydric soils
- Hazardous waste sites

The use of this tool can help for proactive planning for a smoother federal approval process. Additional layers of data can be added by request. The on-line tool is located here.

The Environment Roundtable recommended the MPO’s use of the tool and the Planning and Engineering Committees recommended consideration of the tool to the TTC and Policy Committees.

Leading the presentation will be Tom Hadden, Chair of the Environment Roundtable.

RECOMMENDATION:

None. Presentation only.

STAFF CONTACT:

Teva Dawson, tdawson@dmampo.org;
(515) 334-0075.
ISSUE: Electric Vehicle Readiness Study

REPORT and VOTE: Report and vote to approve the final draft of the Electric Vehicle Readiness Study.

BACKGROUND:

In February of 2014, the MPO received grant funds from the Iowa Economic Development Authority’s Energy Office to conduct a short planning process around Energy Efficiency through Transportation Planning including the following areas of study:

- Long Range Transportation Plan – support an increase in skill sets of staff to effectively use climate change data and incorporate climate change adaptation and mitigation strategies, particularly those that promote energy reduction, into the next long-range transportation plan;
- Transportation Choices – develop a regional on-street bike feasibility study to shift more users from automobile to non-motorized transportation modes; and,
- Clean Vehicles, Clean Fuels – develop a plan for the location of plug-in electric vehicle (PEV) charging stations and electric vehicle implantation strategies throughout Greater Des Moines.

Included, as a supplemental item, is a report outlining key actions MPO member communities can take to support the adoption of electric vehicle use by private citizens through increasing the installation of electric vehicle charging including:

- Take the lead in installing public-access electric vehicle supply equipment (charging stations);
- Incentivize local installation of electric vehicle supply equipment at the workplace and multi-unit residential facilities; and,
- Integrate electric vehicle infrastructure into comprehensive plans.

The Engineering and Planning Subcommittees as well as the Environment Roundtable have reviewed and moved consideration of the study.

RECOMMENDATION:

Approve the Electric Vehicle Readiness Study.

STAFF CONTACT:

Teva Dawson, tdawson@dmampo.org; (515) 334-0075.
ISSUE: **On-Street Bicycle Facilities Feasibility Study**

REPORT and VOTE: Report and vote approve the *On-Street Bicycle Facility Feasibility Study*, which identifies opportunities for on-street bike lanes throughout the MPO.

BACKGROUND:

In February of 2014, the Des Moines Area MPO received grant funds from the Iowa Economic Development Authority’s Energy Office to conduct a short planning process around Energy Efficiency through Transportation Planning. One aspect of this study is to develop a regional on-street bike feasibility study to encourage more automobile users to participate in active transportation modes.

The key to achieving a higher level of bicycle commuters is providing a connected network of facilities that provide convenient access to employment and shopping. Staff reviewed current plans for on-street facilities in the region and developed a map showing proposed routes to complete the network. The Study includes:

1. A map of streets in the region that can currently feasibly include some type of on-street facility; and,
2. Current best practices in bicycle lane design policies and standards.

Staff has met several times with a special committee to review and provided feedback on the development of the feasibility study. The committee’s feedback has been incorporated into the draft report.

Included, as a supplemental item, is the final report including an on-street bicycle facilities network map.

The Engineering and Planning Subcommittees as well as the Bicycle & Pedestrian Roundtable have reviewed and moved consideration of the study.

RECOMMENDATION:

*Approve the On-Street Bicycle Facilities Feasibility Study.*

STAFF CONTACT:

Aaron Bartling, abartling@dmampo.org; and,
Zach Young, zyoung@dmampo.org;
(515) 334-0075.
ISSUE: Travel Demand Model Approval

REPORT and OPTIONAL VOTE: Consider approval of the updated regional travel demand model.

BACKGROUND:

In 2012, the MPO initiated an update of the regional travel demand model with the assistance of the Iowa Department of Transportation and the consulting firm HNTB. The update was intended to correct deficiencies identified in the current model and to integrate a mode-choice component to the model.

The project consultant team recently finished work on the model development and currently is finalizing the model documentation. The project consultant notes that the highway portion of the model’s validation statistics are within the acceptable limits established by NCHRP.

MPO staff would like to begin the process for the MPO to officially adopt the new model for use in the region’s transportation planning activities once Mobilizing Tomorrow is approved.

The MPO’s Engineering Subcommittees has discussed the model update and recommended its approval.

RECOMMENDATION:

Recommend approval of the update regional travel demand model.

STAFF CONTACT:

Dylan Mullenix, dmullenix@dmampo.org.
(515) 334-0075.
ISSUE: 2050 Growth Scenario

REPORT and OPTIONAL VOTE: Consider approval of the 2050 Growth Scenario to be used with the regional travel demand model.

BACKGROUND:

The MPO develops a growth scenario – a forecast of where future development could occur – during the long-range transportation plan process. The scenario is an input to the travel demand model that, in turn, forecasts future traffic volumes, transit ridership, and areas of congestion.

Over the last several months, MPO staff has worked with local planners to develop a growth scenario that respects infrastructure investments communities have made in the near term yet strives for growth as outlined in The Tomorrow Plan’s preferred growth scenarios in the long term.

MPO staff would like to begin the process for the MPO to officially adopt the new growth scenario to use in the updated travel demand model Mobilizing Tomorrow is approved.

The MPO’s Planning Subcommittee has reviewed and discussed the growth scenario and has recommended its approval.

RECOMMENDATION:

Recommend approval of the 2050 Growth Scenario.

STAFF CONTACTS:

Dylan Mullenix, dmullenix@dmampo.org;
(515) 334-0075.
ISSUE: Fiscal Year 2015 Unified Planning Work Program – Amendment 1

REPORT and OPTIONAL VOTE: Consider approval an amendment to the Fiscal Year 2015 Unified Planning Work Program to add the Rail Port Study as a special project.

BACKGROUND:

In Fiscal Year 2013, the Iowa Department of Transportation (DOT) awarded the MPO with a $100,000 grant from the Railroad Revolving Loan and Grant Program. The $25,000 in local match is being provided for the project from the Greater Des Moines Partnership as part of the Capital Crossroads Vision Plan implementation.

The MPO initiated the study in Fiscal Year 2014, expending approximately half of the grant funds. The study is expected to conclude in Fall 2014. The requested amendment to the Fiscal Year 2015 Unified Planning Work Program (FY 2015 UPWP) will allow the MPO to receive reimbursements from the Iowa DOT for the remaining half of the grant funds.

Included on the following pages is an amended budget summary for FY 2015.

RECOMMENDATION:

Approve the first amendment to the FY 2015 UPWP.

STAFF CONTACTS:

Dylan Mullenix, dmullenix@dmampo.org; (515) 334-0075.
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BACKGROUND:

The MPO annually conducts a Travel Time Survey to assist in determining changes in the traffic patterns in the region, determining if there are congestion issues to address, and measuring performance measures. The survey is typically conducted in October of each year.

The MPO now has access to INRIX traffic data through an agreement with the Iowa Department of Transportation. This data allows staff to collect data for specific periods on nearly any route and compare them to historical data for the same route. Based on the access to this data the MPO would like to solicit routes from communities to be surveyed in 2014. Staff is able to conduct such surveys at any time rather than just October, however the formal survey of routes will still use October as the baseline has been established and conditions are most appropriate during that time period.

RECOMMENDATION:

None. Report and discussion only.

STAFF CONTACTS:

Nathan Goldberg, ngoldberg@dmampo.org; (515) 334-0075.
ISSUE: Mobilizing Tomorrow Update

INFORMATION: Des Moines Regional Research, Stats and Data Hub

BACKGROUND:

The MPO continues to work on developing the next long-range transportation plan. Over the last month, MPO staff has worked with the Mobilizing Tomorrow Steering Committee, the Planning Subcommittee, and the Engineering Subcommittee to refine a fiscally-constrained list of transportation projects as well as policy recommendations to include in the final plan.

MPO staff will provide additional details at the August 7, 2014, meeting.

RECOMMENDATION:

None. Report and discussion only.

STAFF CONTACTS:

Dylan Mullenix, dmullenix@dmampo.org;
(515) 334-0075.
ISSUE: Iowa’s Clean Air Attainment Program Schedule

REPORT: Brief report on the Federal Fiscal Year (FFY) 2015 Iowa’s Clean Air Attainment Program Schedule.

BACKGROUND:

Modeled after the federal Congestion Mitigation and Air Quality Improvement Program, Iowa’s Clean Air Attainment Program (ICAAP) was created by the Iowa Department of Transportation (DOT) in 1994. The purpose of ICAAP is to provide funds to transportation projects that maintain the national ambient air quality standards outlined in the 1990 Clean Air Act Amendments.

Each year, the Iowa DOT awards ICAAP funds to projects with the highest potential for reducing transportation-related congestion and air pollution. Applications for ICAAP are available at the Iowa DOT’s ICAAP website, https://forms.iowadot.gov/BrowseForms.aspx?templateid=230017.

Member governments and agencies planning to apply for ICAAP funds should submit letters of intent to the MPO no later than August 15, 2014; ICAAP applications are due to the MPO by 4:30 pm, on Friday, September 12, 2014. The MPO staff will review all ICAAP applications and submit the applications to the Iowa DOT by the October 1, 2014, deadline.

RECOMMENDATION:

None. Report and discussion only.

STAFF CONTACTS:

Zach Young, zyoung@dmampo.org; (515) 334-0075.
ISSUE: Des Moines Regional Research, Stats and Data Hub

INFORMATION: Des Moines Regional Research, Stats and Data Hub, a tool on-line resource recently launched by the Greater Des Moines Partnership, with sponsorship from the MPO, The Tomorrow Plan, Capital Crossroads, Mid-American Energy, and the Cultivation Corridor.

BACKGROUND:

The Greater Des Moines Partnership, in partnership with the MPO and other sponsors, launched a new online resource called Des Moines Regional Research, Stats and Data Hub at www.desmoinesmetrodata.com.

The new website is a statistical dashboard filled with rich information on the Greater Des Moines area. Users will find leading indicators along with research and data trends needed to make business and policy decisions. The site offers current economic, demographic, and workforce information sourced from official government data on the five-county Des Moines MSA and six nearby counties. In addition, four subregions representing Central Iowa programs are included under the geographic selections.

Users can compile data within six main categories: Industry, Wages and Income, Workforce, Population Demographics, Social, and Other. Workforce, for example, contains data on employment, fastest growing occupations, college graduates, and degree clusters. The Other category covers patents, imports/exports, and agricultural production. New data sets will be added when they are pertinent to the growth and success of the metro. A Transportation data set will be added in the near future.

Statistics are provided for multiple years, saving time and allowing for easy tracking. Bubble charts for industry, occupation, and college degree clusters visually represent strengths and weaknesses for the area. All of the research is accessible free of charge and is presented in an easy-to-use interface that allows users to customize the data into a dashboard style display format. Charts can even be saved and pasted into presentations for a professional look.

RECOMMENDATION:

None. Information only.

STAFF CONTACTS:

Todd Ashby, tashby@dmampo.org; (515) 334-0075.
This study provides recommendations to local governments in the Des Moines metro area to spur the adoption of electric vehicles through increased installations of charging stations as a means towards a more energy-efficient transportation system.
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EXEClUTIVE SUMMARY

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. Different methods of generating and acquiring power have different levels of impact on the natural environment. The cost of energy impacts the pocketbooks of people and industries. The quest for energy can lead to international political and military conflicts. Identifying and promoting innovative solutions that reduce overall consumption of energy –especially energy from non-renewable sources – would help the Greater Des Moines region maintain its current air quality. The Tomorrow Plan, the recently adopted regional plan for a greener greater Des Moines, recommends 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.

This report outlines some of the first steps the region can take to support and encourage electric vehicle adoption by private citizens. Despite a growing number of state and local efforts around the nation to support electric vehicle adoption, the Des Moines metro region has yet to establish a first-tier market. Due to the fact that the state has yet to see three percent of the population purchase electric vehicles, Iowa has yet to reach the early adoption phase. Because of a lack of a perceived or even real market, manufactures and local governments have seen little benefit in focusing efforts on electric vehicle readiness. Given this, the Des Moines Area Metropolitan Planning Organization has focused on 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 publically 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

Local governments can be powerful catalysts to investing in energy and resource efficiency. 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. Advanced planning and early implementation by local government can spur private sector investment. Local governments in the Des Moines area can expedite the establishment of convenient, cost-effective electric vehicle infrastructure.

This report offers a summary of the first steps of support municipalities can provide and a compilation of additional resources as more interest swells from local citizens, businesses and manufacturers. Ultimately, municipal government needs the support of local advocates, users, and manufactures to go beyond the recommendations offered here.
ACKNOWLEDGEMENTS:

This report was created through grant funding support from the Iowa Economic Development Authority’s State Energy Program Formula award. Electric vehicle readiness is one of a three part study the Des Moines Area MPO conducted to promote energy efficiency through transportation planning.
**Benefits of Electric Vehicles**

Hybrid and plug-in electric vehicles can help increase energy security, improve fuel economy, lower fuel costs, and reduce emissions.

**Energy Security**

The United States imports approximately 40% of the petroleum it consumes and transportation is responsible for nearly three-quarters of the total US petroleum consumption. With much of the world’s petroleum reserves located in politically volatile countries, using plug-in elective vehicles (PEV) instead of conventional vehicles can help reduce U.S. reliance on imported fuels and increase energy security.

**Fuel Economy. Low Operating Costs**

Electric vehicles are highly efficient and can reduce fuel costs dramatically because of the low cost of electricity relative to conventional fuel. Use Find A Car tool on FuelEconomy.gov to compare fuel economy ratings of individual hybrid and conventional models.

**Emissions**

PEVs have significant emission benefits over convention vehicles. They produce zero tailpipe emissions and, according to Argonne National Laboratory, switching from traditional combustion engines to electric vehicles in urban areas will significantly reduce volatile organic compounds, carbon monoxide, sulfur oxide, nitrous oxide, and particulate matter. This can vary based on model and type of electric vehicle. Use the Vehicle Cost Calculator to compare life cycle emissions of individual models our region.

**Infrastructure Availability**

PEVs have the benefit of a flexible fueling: they can charge right in your own home overnight, at a workplace, or a public charging station such as a grocery store.

**Competitive Business Advantage**

While all drivers of gas-powered cars today rely on gas stations, most PEV drivers will use the home garage as their primary refueling stop. PEV drivers, at least in the early years of adoption, will look for opportunistic charging prospects while driving their EVs as opposed to making a special trip to a refueling station. These opportunistic pit stops may come in the form of a shopping trip, a meal at a restaurant, a coffee break, or at work. As PEV adoption increases, drivers may elect to shop where they can also refuel their PEVs so they can attend to two chores in one location. The presence of an EV charging station in the parking lot or garage brings an added cache of value and customer service to a business. Employers and owners of multi-unit residential facilities will similarly build competitive advantage by attracting clean-driving employees and tenants.

**Enhanced Image**

EV charging stations send a powerful message to employees, tenants, and the public that the organization or community is leading in sustainable transportation options. This branding will help to contribute to a “green” image that attracts and retains a quality, progressive workforce.
Electric Vehicle Basics

Vehicle Types
Plug-in electric vehicles have the ability to charge from an off-board electric power source. PEVs can be “plugged in,” as opposed to hybrid electric vehicles (HEVs) which supplement power from a propulsion source and cannot be plugged in. There are two basic types of PEVs: EVs and PHEVs.

All-Electric Vehicles (EVs) use batteries to store the electrical energy that powers them. The batteries are charged by plugging the vehicle into a power source or while braking. EVs have no tail-pipe emissions. They typically have a shorter range than conventional vehicles and have a range of about 100 miles on a fully charged battery.

Plug-in Hybrid Electric Vehicles (PHEVs) use batteries and another fuel, such as gasoline, to power the vehicle. Even while running on gasoline, PHEVs consume less fuel than regular combustion vehicles. PHEVs have an all-electric driving range higher than that of EVs by 10 – 40 additional miles.

The Sierra Club has an on-line guide to EV and PHEVs vehicles currently available with reviews, price estimates, and CO2 emissions will be saved in fueling each model.

Charging Stations
There are three main types of electric vehicle supply equipment (EVSE) which differ based on supply capabilities and how quickly they can charge a vehicle. EVSE can be installed at homes, workplaces, private fleet facilities, and public stations.

Level 1 EVSE provides charging through a 120-volt plug and will typically be used in residential settings. Depending on the battery type and vehicle, Level 1 charging adds about 2-5 miles of range to a PEV per hour of charge time. No additional equipment is needed.

Level 2 EVSE offers charging through a 240-volt or 280-volt electrical service and is a common installation for home, workplace, fleet, and public facilities. Level 2 EVSE requires the installation of charging equipment and is hard-wired for safe operation. Depending on the battery type, Level 2 charging adds about 10 to 20 miles of range to a PEV per hour of charge time. Estimates for total cost of installing a typical charging station is $15,000 to $18,000.

DC Fast Charging enables rapid charging due to the 480-volt input and is recommended for sites such as heavy traffic corridors. A DC fast charger can add 60 to 80 miles of range to a PEV in 20 minutes. Installation price for a DC fast charging station ranges from $65,000 to $80,000.

Find the locations of stations in the Des Moines area by visiting the Department of Energy’s Alternative Fueling Station Locator. A map of locations to date can be found in Appendix IV.
LOCAL GOVERNMENT LEADERSHIP

EVs 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 publically-available Level 2 charging stations is needed to encourage more 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 Des Moines Area MPO has mapped ideal locations for EVSE installation for each of the 17 member communities (Appendix I) 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 travels tend to stay parked for at least an hour.

The Des Moines Area 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 publically 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.

**Workplace**
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 Des Moines Area MPO mapped locations with a high number of employees to locate dense workplace zones to assist planners to focus on workplace charging initiatives (Appendix II). Click on the region of the community to view recommendations for workplace locations: Metro-wide, Downtown Des Moines, East Metro, West Metro, Northeast Metro, Northwest Metro, Southeast Metro, and Southwest Metro.

**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% 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 Des Moines Area MPO has mapped areas for optimal fast charging stations (Appendix III).
MEANS TO INCENTIVIZE INSTALLATION

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-volte/40 amp outlet on a dedicated circuit and in close proximity to designated vehicle parking to accommodate the future hardwire 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 hardwire 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 Des Moines Area 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:

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

Source: The Hardford, NREL 26470
RECOMMENDATION 3: COMPREHENSIVE PLAN & CODE UPDATES

To ensure EV-friendly local government commitment through ordinances and zoning, the Des Moines Area 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.
**Electric Vehicles and Road Use Tax**

A loss of road taxes can occur due to plug-in electric vehicles (PEVs) not needing gasoline and therefore not paying the tax included in the price of gasoline. To address this issue, a number of states have started implementing registration fees for PEVs. Below is a list of states that have fees in place. These descriptions are pulled from the Alternative Fuels Data Center (AFDC) Laws & Incentives database (http://www.afdc.energy.gov/laws/).

**Colorado - Alternative Fuel and Advanced Vehicle Tax**
Excise taxes are imposed on compressed natural gas (CNG), liquefied natural gas (LNG), and liquefied petroleum gas (LPG) effective January 1, 2014, on a per gallon basis as follows:

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CNG</td>
<td>$0.03</td>
<td>$0.06</td>
<td>$0.09</td>
<td>$0.12</td>
<td>$0.15</td>
<td>$0.183</td>
</tr>
<tr>
<td>LNG</td>
<td>$0.03</td>
<td>$0.05</td>
<td>$0.07</td>
<td>$0.08</td>
<td>$0.10</td>
<td>$0.12</td>
</tr>
<tr>
<td>LPG</td>
<td>$0.03</td>
<td>$0.05</td>
<td>$0.07</td>
<td>$0.09</td>
<td>$0.11</td>
<td>$0.135</td>
</tr>
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Beginning January 1, 2014, plug-in electric vehicle (PHEV) owners must pay an annual registration fee of $50. After paying the fee, the vehicle owner must affix the PHEV registration decal to the front windshield of the vehicle. Fees contribute to the Highway Users Tax Fund and the Electric Vehicle Grant Fund. (Reference House Bill 13-1110, 2013 and Colorado Revised Statutes 39-27-102 and 42-3-304)

**Illinois - Electric Vehicle (EV) Registration Fee Reduction**
The owner of a dedicated all-electric vehicle may register for a discounted registration fee not to exceed $35 for a two-year registration period. The registration fee for an EV may not exceed $18 per year. To qualify for the reduced fee, the EV must weigh 8,000 pounds or less. (Reference 625 Illinois Compiled Statutes 5/3-805)

**Nebraska - Alternative Fuel Vehicle (AFV) Registration**
A fee of $75 is required for the registration of an AFV that operates on electricity, solar power, or any other source of energy not otherwise taxed under the state motor fuel tax laws. Compressed natural gas, liquefied natural gas, and liquefied petroleum gas (propane) are not subject to this requirement. (Reference Nebraska Revised Statutes 60-306 and 60-3,191)
**North Carolina - Annual Electric Vehicle (EV) Fee**
The owner of an EV that does not rely on a non-electric source of power must pay a fee of $100 in addition to any other required registration fees at the time of initial registration and annual registration renewal. (Reference Senate Bill 402, 2013, and North Carolina General Statutes 20-87)

**Oregon - Plug-in Electric Vehicle (PEV) and Hybrid Electric Vehicle (HEV) Registration Fees**
PEVs and HEVs are registered biennially, with the exception of new vehicles for which new registration plates are issued. Certain PEVs and HEVs, including commercial buses, follow an annual registration period. The registration fee is $43 per vehicle for each year of the registration period. There is an additional fee for PEVs or HEVs in certain weight categories. (Reference Oregon Revised Statutes 803.415 and 803.420)

**Virginia - Alternative Fuel and Vehicle Tax**
Liquid alternative fuels used to operate on-road vehicles are taxed at a rate of $0.175 per gallon. These fuels are taxed at the same rate as gasoline and gasohol (3.5% of the statewide average wholesale price of a gallon of self-serve unleaded regular gasoline). Alternative fuel vehicles and all-electric vehicles (EVs) registered in Virginia are subject to a $64.00 per vehicle annual license tax. EVs are also subject to an additional $50 annual license tax. Some exceptions apply. The Virginia Department of Motor Vehicles will establish a process to refund any prepaid annual license tax collected on hybrid electric vehicles for registration years beginning on or after July 1, 2014. (Reference Senate Bill 127, 2014, and Virginia Code 58.1-2217 and 58.1-2249)

**Washington - Electric Vehicle (EV) Fee**
EV operators must pay an annual vehicle registration renewal fee of $100. This fee expires if the legislature imposes a vehicle miles traveled fee or tax in the state. (Reference Revised Code of Washington 46.17.323)

Below are states that are considering a PEV fee through a study:

**Indiana - Plug-In Electric Vehicle (PEV) and Hybrid Electric Vehicle (HEV) Road Impact Fee Study**
The Interim Study Committee on Road Impact Fees (Committee) will study issues related to the imposition of road impact fees on PEV and HEV users. The Committee must report its findings and recommendations to the legislative council by November 1, 2013. (Reference Indiana Code 2-5-36.3)

**Vermont - Alternative Fuel Vehicle (AFV) User Fee Study**
As required by the legislature, the Vermont Agency of Transportation, in consultation with the Joint Fiscal Office, the Motor Vehicle Department, Department of Taxes, and Department of Public Service, analyzed and reported on options for user fees and fee collection mechanisms for AFVs using fuels that are not currently taxed. In addition, the Committee on Transportation Funding released a report on estimated transportation revenues over five years and potential new sources of revenue, including a tax based on vehicle miles traveled. For more information see the Vermont Transportation Funding Options Final Report (PDF). (Reference House Bill 770, 2012)
RESOURCES

EDUCATION AND OUTREACH MATERIALS

- Well-to-wheels life cycle analysis comparing total emissions of PEV with conventional vehicles, pg. 94
- Energizing Oregon: Workplace Charging, page 31
- Messaging and outreach links from Plug-in Electric Vehicles Collaborative
- Benefits of PeVs to Property Developers, Colorado Electric Vehicle and Infrastructure Readiness Plan, Appendix 14
- Energy security benefits of PEV Adoption, Florida Gold Coast Clean Cities, Vol 1, Section 3-15
- Plug-In Electric Vehicle Handbook for Workplace Charging Hosts
- The Daily Caller: States turn against electric cars as gas tax revenues fall.

SITE DESIGN, PERMIT AND SIGNAGE GUIDELINES

- Kane County, Illinois
- EV Infrastructure Guide for Local Governments in Washington State
- EV Charging Infrastructure Deployment Guidelines for Oregon
- Sample permit for charging equipment installation
- Plug-In Electric Vehicle Handbook for Workplace Charging Hosts
- The EV Project: Accessibility at Public EV Charging Locations

SAMPLE ZONING AND CODE LANGUAGE

- Kane County, IL
- City of Auburn Hills, MI
- Arlington, VA
- EV Infrastructure Guide for Local Governments in Washington State
- Model ordinance and building code amendment

LOCAL RESOURCES FOR EV CHARGING STATIONS

- Crescent Electric (several Iowa locations) – Bob Settle bob.settle@cesco.com
- Lilypad EV (based in Kansas City) – larry.kinder@lilypadev.com
- Schneider Electric (has a location in Cedar Rapids) michelle.felser@schneider-electric.com; brett.larson@schneider-electric.com
- Van Meter, Inc (with multiple Iowa locations including Urbandale) distributes EV charging equipment for several manufacturers, Eaton, ChargePoint, and Clipper Creek.
  - Brian Levin, ChargePoint Brian.Levin@ChargePoint.com 847-903-6652
  - Stuart Irwin, Clipper Creek stuart@clippercreek.net 248-408-4162
APPENDIX I: OPTIMAL LOCATIONS FOR PUBLIC ACCESS CHARGING STATIONS

Optimal Public Access Charging Locations
Metro

- Suggested Charging Site
- No. Destinations by Traffic Analysis Zone:
  - 1 - 2
  - 3 - 4
  - 5 - 6
  - 7 - 9
  - 10 - 14

Des Moines Area Metropolitan Planning Organization
Optimal Public Access Charging Locations
Downtown Des Moines

Des Moines

Suggested Charging Site

No. Destinations by Traffic Analysis Zone
1 - 2
3 - 4
5 - 6
7 - 9
10 - 14

Scale: 0 - 1.5 Miles
Optimal Public Access Charging Locations

Mitchellville

Suggested Charging Site

No. Destinations by Traffic Analysis Zone

- 1-2
- 3-4
- 5-6
- 7-9
- 10-14

0.0 0.4 0.8
0.0 Miles
APPENDIX II: OPTIMAL WORKPLACE CHARGING LOCATIONS
APPENDIX III: OPTIMAL FAST CHARGE LOCATIONS

Optimal Fast Charge Locations, Metro Area

Des Moines Area Metropolitan Planning Organization
APPENDIX IV: CURRENT LOCATIONS OF CHARGING STATIONS IN THE METRO
On-Street Bikeway Feasibility Study
Energy Efficiency through Regional Planning

August 2014

This study looks at energy efficiency, changing demographics, economic development opportunities, and public health benefits. It provides options for communities to implement on-street bike facilities, highlighting priority corridors and inter-city connections while considering trails, current bikeways, and employment centers.
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Appendix A | NACTO Guidance
Appendix B | Raw NACTO Analysis Results
Appendix C | Complete Streets Policy
1 | EXECUTIVE SUMMARY

PURPOSE

With goals laid out in *The Tomorrow Plan* and *Mobilizing Tomorrow*, the region is seeing a shift in focus towards resilient economies, healthy environments, and the health and well-being of all residents. This study provides assistance with reaching these goals by developing a regional on-street bikeway feasibility plan to shift more users from automobile to non-motorized transportation modes, thereby reducing short motor vehicle trips that have high per-mile fuel consumption and emission rates.

Changing demographics show that young professionals and baby boomers have a greater interest in living in dense walkable neighborhoods that are bike-friendly and accessible to multiple transportation options. Neighboring cities in the Midwest have become aware of this change of interest and are being proactive with their efforts to implement extensive on-street bikeway networks. The City of Minneapolis has been ranked as one of the best biking cities in the country by Bike Score, and the 2nd best biking city in the nation by Bicycling Magazine. Currently, Minneapolis has 92 miles of on-street bikeways and had a bike commuting rate of 4.1 percent in 2010, up from 1.9 percent in 2000. To be marketable and to maintain growth in the region, Greater Des Moines needs to focus on these demands of the millennial and baby boomer generations.

Promoting active transportation options benefits the public health in multiple ways. First, it supports a healthier lifestyle that allows people to not be as dependent on their automobile when making shorter trips. Second, crash rates have been proven to decrease on corridors that have undergone road diets, therefore increasing safety. In Des Moines, Ingersoll Avenue was converted to a 3-lane, with bike lanes in both directions and parking on each side. After the conversion, the total number of reported crashes with injuries decreased by 30 percent. A 2006 study by Iowa State University looked at twelve 3-lane conversions and found similar results to Ingersoll Avenue with a 29 percent reduction in the number of crashes.

This study is part of a solution to provide people with the necessary on-street facilities to support bicycle commuting. Before implementing extensive on-street networks, cities such as Minneapolis and Portland had very low commuting rates much like Des Moines. In 2010, Portland had the highest bicycle commuting rate in the nation at 6.1 percent, up from 1.8 percent in 2000. By adding an extensive on-street network, the city was able to drastically increase its bike commuting rate.

Additional economic development, health and safety, and community development benefits can be found by visiting PeopleForBikes.org.

FEASIBILITY

The intent of this study is to provide options for communities as they begin implementing on-street facilities. It asks the question, “What is feasible?” To answer that question, various factors were assessed to determine roads that currently have the capability to handle an on-street facility. It highlights corridors and inter-city connections that involve primarily low-cost road conversions that are relatively simple to do (i.e., Ingersoll Avenue).

Before communities install facilities identified in this study, a more in-depth analysis should be completed on the route to determine whether an alternative route along the same general corridor should be used or not. This study simply provides a recommendation for where there is potential for easy, low-cost conversions that would accommodate on-street facilities.
The proposed bikeway network was developed using guidance from the National Association of City Transportation Officials (NACTO). This guidance assessed existing roads based on their posted travel speeds, traffic volumes, and street classification. In addition to this guidance, street widths were also looked at. Local streets were not included in the analysis to develop the proposed bikeway network. Speed limits and traffic volumes tend to be low enough on local streets, allowing for it to already be considered bike-friendly.

Using the guidance from NACTO, all roads in the region that have potential for on-street accommodations were identified and mapped. From there, additional layers were assessed to develop an efficient and well-connected bikeway network for the region. A final map includes the proposed bikeway network that highlights corridors for on-street biking. A second map includes the recommended facility types to be installed on each of the corridors.
2 | Methodology

Joint Subcommittee

To assist with the development of this study, a joint subcommittee made up of representatives from both the MPO’s Bicycle and Pedestrian Roundtable and the Engineering Subcommittee, was formed. This subcommittee included the following people:

- Vern Willey, Community Services Director, City of Altoona
- Dave McKay, Director of Engineering – Public Works, City of Urbandale
- Jennifer Bohac, City Traffic Engineer, City of Des Moines
- Mike Ring, Principal Traffic Engineer, City of Des Moines
- Mindy Moore, Park Planner II, City of Des Moines
- Mark Arentsen, City Administrator, City of Bondurant
- Joe Cory, Deputy Public Works Director, City of West Des Moines
- Cory Scott, Urban Planner, RDG Planning + Design
- Carl Voss, Des Moines Bicycle Collective
- David Fliehler, Shive-Hattery Architecture + Engineering

The subcommittee met several times over a four-month period to review/discuss several different topics, including Bicycle Master Plans from the Cities of Des Moines and West Des Moines, the Bicycle Collective’s Bike Commuter Map, a macro-level on-street bikeway network design, standards for the design of facilities and signage/markings to go along with them, and education needs.

Analysis

As previously mentioned, this study used guidance from the National Association of City Transportation Officials (NACTO) to develop a regional bikeway network for the MPO planning area that offered recommendations for what types of facilities get implemented and where they are located based on several factors. The following factors were assessed for all existing, non-local streets in the region:

- Posted travel speed (mph)
- Annual Average Daily Traffic (AADT)
- Street Federal Functional Classification (FFCS)

This analysis mainly looks at existing streets that would create a network which, in theory, could be implemented today, with recommended facility types based on the characteristics of those streets. The following facility types from the NACTO guidance were considered when making recommendations:

- **Shared lane marking**: marking that is applicable on roadways where speed differential between motorists and bicyclists is low and/or to fill short gaps in the bikeway network.
- **Bike lane**: exclusive space for bicyclists through the use of pavement markings and signage (without buffers or barriers).
- **Buffered bike lane**: traditional bike lane separated by painted buffer to vehicle travel lanes and/or parking lanes.
- **Cycle track**: physically separated bikeway. Could be one or two way and protected by a variety of techniques.
Certain facility types included in the NACTO guidance were not considered in this study. The first one, neighborhood greenway, is defined as a comfortable and attractive bicycling environment that doesn’t utilize physical separations. Neighborhood greenways are found on local streets, where traffic volumes and speed limits are low. As previously mentioned, these streets could already be considered bike-friendly and wouldn’t need extra markings and/or signage to identify it as that. The second type not considered is a shared use path, defined as being completely separated from a roadway. Since this study’s purpose is to create an on-street network, shared use paths do not apply.

Facility types were recommended based on the factors listed above. Depending on the amount of traffic, the posted speed limit, and the street classification, a specific facility type would get recommended for each road segment. A detailed breakdown of the NACTO guidance can be found in Appendix A of this report. Appendix B contains maps displaying the raw results of the NACTO analysis broken down by facility type.

In addition to using the NACTO guidance, various other layers were assessed to ensure that the proposed network is well-connected and provides efficient routes for riders to choose from. These layers included the following:

- Des Moines Bicycle Collective Commuter Map
- Existing facilities (trails/on-street)
- Planned facilities (trails/on-street), including Bicycle Master Plans from the Cities of Des Moines and West Des Moines
- Employment centers
- Transit routes (DART)
- Inter-city connections

Connecting the regional network to each of these layers is crucial to its success as it shows where people are already going and where communities are already investing their money and time. Also, by connecting to each of the layers, inter-city connections will be made as these factors are spread out across multiple jurisdictions.

**Review**

Throughout the process of developing this study, feedback was sought after from various MPO committees that included city/county staff and elected officials. A draft version of the proposed bikeway network map was presented to the following MPO committees for comments and feedback:

- Central Iowa Bicycle and Pedestrian Roundtable;
- Planning subcommittee;
- Engineering subcommittee;
- Mobilizing Tomorrow steering committee;
- Transportation Technical Committee; and
- Policy Committee.

Additionally, the draft proposed bikeway network map was posted to the MPO’s website and included in the June MPO newsletter to give the public an opportunity to provide feedback.
3 | Mapping

Two critical maps were created as outcomes of this study. The first map displays the proposed bikeway network, overlaid with various other bicycle and pedestrian layers. A second map provides recommendations for the type of facility that could be installed on each of the routes in the regional network. The Proposed Bikeway Network and Recommended Facility Types maps are included on the following pages. These maps are best viewed digitally where you can zoom further into areas of interest.

Proposed Bikeway Network

The proposed bikeway network map incorporates multiple layers to establish an extensive, well-connected system for Greater Des Moines. The network includes proposed routes from the Cities of Des Moines and West Des Moines’ bike master plans, existing on- and off-street facilities, priority gaps in the regional trail system, and additional proposed on-street routes identified using the NACTO guidance. Proposed on-street routes provide connections to the off-street system, and are viewed as the priority corridors to complete an extensive regional bikeway network. Priority corridors can be found in the Proposed Bikeway Network map.

Missing Connections

A majority of the routes included in the proposed on-street network are ones that would involve simple, low-cost conversions based on road widths, speed limits, and traffic volumes. However, gaps were still present in parts of the region. Gaps existed in areas where roads are currently not capable to accommodate on-street facilities, or in some cases, where a road currently does not exist. They were viewed as necessary to include in the network as they created important connections to certain areas in the region. These gaps were identified in the proposed bikeway network with a different color to make aware of the fact that these routes could be more costly and require major improvements to the road.

Recommended Facility Types

Using the NACTO guidance, facility types were identified for each of the proposed on-street routes in the network. Recommendations were not made for all of the planned routes in Des Moines and West Des Moines’ Bike Master Plans, as facility types have already been determined for these routes. Occasionally, multiple facility types were indicated for the same route segment. For these instances, a facility type was chosen based on consistency with the entire corridor or route and the level of separation for the facility type (higher level of separation results in higher levels of user comfort). Recommendations can be found in the Recommended Facility Types map.
4 | FUTURE ROADS

Future roads were not included in the development of the proposed bikeway network¹ with the intent that new roads would already be considering on-street bikeway possibilities. In addition to that, many communities in the region that have built new roads, are doing so with trails alongside them to provide links to the regional trail network.

TIP REVIEW

Using the MPO’s Transportation Improvement Program (TIP), road projects programmed out to 2018 were assessed to determine whether or not they are located on segments of the proposed bikeway network. If a project is located on the network, and the cost of incorporating on-street facilities does not exceed twenty percent of the total project cost, it would be recommended that the project sponsor work with MPO staff to try and incorporate an on-street facility into the project.

The following projects programmed in the Federal Fiscal Year 2015-2018 Transportation Improvement Program are located on the proposed bikeway network and should consider on-street facilities:

<table>
<thead>
<tr>
<th>Year</th>
<th>Location/Description</th>
<th>Sponsor</th>
</tr>
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<tbody>
<tr>
<td>2015</td>
<td>NW 66th Ave: From NW Beaver Dr to NW 26th St – Grade and Pave, Pavement Widening, Bridge Replacement</td>
<td>Des Moines</td>
</tr>
<tr>
<td>2015</td>
<td>SE Connector: From SE 15th St to SE 30th St – Grade and Pave, ROW</td>
<td>Des Moines</td>
</tr>
<tr>
<td>2015</td>
<td>E Indianola Avenue: SE 16th Ct to Army Post Rd – Grade and Pave, ROW</td>
<td>Des Moines</td>
</tr>
<tr>
<td>2015</td>
<td>E Euclid Ave: From east of US 69 east 0.8 mile and from I-235 to Hubbell Ave – Pavement Rehab</td>
<td>MPO-26/DMAMPO</td>
</tr>
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<td>2015</td>
<td>Hickman Rd: From 3 blocks west of 63rd St to 1 block south of Hickman Rd – Scenic or Historic Hwy</td>
<td>Windsor Heights</td>
</tr>
<tr>
<td>2015</td>
<td>University Ave: Traffic Control System at 18 intersections from 25th St to 92nd St</td>
<td>West Des Moines</td>
</tr>
<tr>
<td>2015</td>
<td>Downtown Bicycle Plan implementation</td>
<td>Des Moines</td>
</tr>
<tr>
<td>2017</td>
<td>Euclid Ave: Highland Park Streetscape from 6th Ave to Cornell St</td>
<td>Des Moines</td>
</tr>
<tr>
<td>2017</td>
<td>SE Connector: From SE 30th St to US 65 – Grade and Pave, ROW</td>
<td>Des Moines</td>
</tr>
<tr>
<td>2018</td>
<td>Indianola Ave: From E Army Post Rd to US 69 – Pavement Widening</td>
<td>Des Moines</td>
</tr>
<tr>
<td>2018</td>
<td>E Douglas Ave: From E 42nd St to E 56th St – Grade and Pave, Pavement Widening, ROW</td>
<td>Des Moines</td>
</tr>
</tbody>
</table>

COMPLETE STREETS POLICY

Looking beyond currently funded projects, it would be recommended that future road projects applying for funding from the MPO would need to comply with a Complete Streets policy. By adopting a Complete Streets policy, transportation planners and engineers in the region will routinely design and operate right-of-ways to allow safe access for all users, resulting in healthier and improved street networks. An example Complete Streets policy for the MPO can be found in Appendix C.

¹ With the following exceptions: routes identified in city bike master plans, proposed University Avenue in Waukee, SE Connector extension, and Meacham Drive extension in Pleasant Hill.
5 | Design Standards

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 subcommittee 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 subcommittee 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 subcommittee identified six key areas to provide guidance.

- Bike Lane and Shared Lane Markings
- Intersection Crossing Treatments
- Bicycle Signal Detection
- Pavement Marking Material Guidance
- 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 Figure 2. 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 subcommittee 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 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.
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 (Figure 3). To minimize the cost of purchasing additional stencils, the City of Des Moines was granted approval through the FHWA to utilize the same helmeted bicycle symbol on shared lane markings as used to designate bike lanes (Figure 4).

**RECOMMENDATION**

The subcommittee 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 for placement of symbols. Intervals of placement shall not exceed 500 feet.
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 subcommittee 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, video detection, etc.). A common issue cyclists encounter when navigating a signalized intersection is where to position themselves to activate the traffic signal. For a bicycle to be detected the bicycle must be placed within the red highlighted areas as shown on Figure 5 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 (Figure 5), and a R10-22 sign (Figure 6) so that the bicyclist knows the intersection has detection and where to position their bicycle to activate the signal.

RECOMMENDATION

The subcommittee 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 Figure 5.
**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.

Durable Liquid Pavement Markings (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 subcommittee 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*. 

**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 (Figure 7). 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. (Figure 8).

**Recommendation**

To increase visibility at conflict areas, the subcommittee recommends only using green colored pavement markings in conflict areas as shown in the top graphic of Figure 8 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.
Facility Signage

An R3-17 “Bike Lane” sign (Figure 9) 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 queue 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.

Recommendation

The subcommittee 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 (Figure 10) is a sign used to designate the potential presence and right for bicyclists to occupy the road. This sign, unlike the R3-17 “Bike Lane” sign is reserved for streets with shared lanes or a designated bike route. The MUTCD added the R4-11 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 (Figure 11). 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 subcommittee 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 (Figure 12) 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 can then be compiled and prioritized along the routes as primary, secondary and tertiary points of interest as shown on the sample “Decision Sign” in Figure 12. The level of effort to study on-street wayfinding and make proper recommendations exceeds the scope of this study.

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

**FIGURE 12 | SIGN TYPES AND PLACEMENT**

Source: NACTO
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 is a must have for any community working to improve their on-street bicycle network and should be the starting point for any facility design.

Valuable Resources:  
http://nacto.org/cities-for-cycling/design-guide/  
http://transect.org/docs/bicycling_pdfs.zip

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**PS — Paved Shoulder**

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**SL — Shared Lane**

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<tr>
<td>Intersection Treatment</td>
<td>Signed, signalized, indicator loops</td>
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<tr>
<td>AADT</td>
<td>≤ 8,000</td>
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**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
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<td><strong>AADT</strong></td>
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6 | EDUCATION NEEDS

Education will play a key role in bringing this bikeway network to life. Interests of the Bikeway Joint Subcommittee focused on the need for education that’s different for bikers, city/county staff, and policy makers. Opportunities to reach out to each of these groups were discussed and are mentioned in the sections below.

BIKERS

Two areas of focus for educating bikers are on traffic laws and overall safety. It’s important for those that are using the bikeway system to be familiar with local laws related to on-street biking. These laws could potentially dictate where a biker can and cannot ride. Knowing and understanding the laws will also contribute to overall safety as they are often put in place to minimize the risk and reduce conflicts for bikers. For instance, in Iowa, a bicyclist that is traveling at a speed less than the speed of traffic must ride as close as practicable to the right-hand edge of the roadway (Iowa Code §321.297). Various workshops and educational bike rides could be held to inform bikers of these issues and help them become comfortable with riding on streets.

CITY/COUNTY STAFF

Several opportunities exist to educate staff at the city and county levels on bicycle facilities. One opportunity is to take staff members out in the field and actually ride on various facilities. This could be done locally in areas where on-street facilities are more prevalent, like Downtown Des Moines. Or, trips could be planned to cities such as Minneapolis, Chicago, or Boulder, CO where bike networks are more extensive. This would allow for staff members to experience what it’s like to ride on a connected network and give them an opportunity to test out different types of facilities.

Educating city and county staff about design standards of such facilities is also very important. When staff members begin to plan on-street networks in their communities, it’s essential that they have a good understanding of the proper uses of each facility and the designs that go with them to ensure that it will be successful. Bringing in speakers with experience in design standards would help provide this education to city and county staff.

POLICY MAKERS

Policy makers play a significant role in the success of bikeway networks because they will be the ones deciding whether or not such a network will be implemented. Providing them with education on bicycle facilities will give them a better understanding of the benefits that come with having on-street facilities. Along with city and county staff, policy makers also have the opportunity to “learn in the field” by planning rides in the Greater Des Moines area or scheduling trips to neighboring Midwestern cities previously mentioned to help them learn more about how bikeway networks work.

Additional opportunities to educate not only policy makers, but city/county staff and bikers as well, is to provide LCI training. LCI stands for a League Cycling Instructor, and is someone that is certified from the League of American Bicyclists to teach Smart Cycling classes to people of all ages. The goal of these classes is to teach bike safety and skills to increase the comfort levels and confidence of bikers. More information on LCI training can be found here: http://bikeleague.org/content/take-class.
The Des Moines Area Metropolitan Planning Organization (MPO) has prepared this report with partial funding from the United States Department of Transportation’s (DOT) Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), and in part through local matching funds provided by the MPO member governments. These contents are the responsibility of the MPO. United States Government and its agencies assume no liability for the contents of this report or for the use of its contents.

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### Bicycle Facility Contextual Guidance

#### Facility Type 1

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#### Shared Lane Marking

- Marking that is applicable on roadways where speed differential between motorists and bicyclists is low and/or to fill short gaps in the bikeway network.

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#### Bike Lane

- Exclusive space for bicyclists through the use of pavement markings and signage (without buffers or barriers).

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#### Buffered Bike Lane

- Traditional bike lane separated by painted buffer to vehicle travel lanes and/or parking lanes.

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<th>Street Class</th>
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#### Cycle Track

- Physically separated bikeway. Could be one or two way and protected by a variety of techniques.

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#### Shared Use Path

- Completely separated from roadway, typically shared with pedestrians.

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### Posted Travel Speed (mph)

- This chart offers guidance as to what types of treatments are recommended depending on street classification, speed, and volume. No matter where bicycle treatments are applied, special care needs to be paid to intersections, driveways, on-street parking, sight distance, and additional factors.

### Notes:

1. Refers to specific bicycle facilities described in the NACTO Urban Bikeway Design Guide. See [http://www.nacto.org](http://www.nacto.org) for detailed design guidance. Many local roads function just fine as they are due to their low traffic volume and speed.
2. Categories from [http://www.fhwa.dot.gov/planning/fcoc2_1.htm](http://www.fhwa.dot.gov/planning/fcoc2_1.htm). The use of functional classes provides some general context for the cases in which bicycle facilities are most likely to be implemented. Land use and additional factors (see 4) should always take precedence in determining which facility type to select.
3. Urban peak hour factors typically range from 8 to 12 percent of AADT. For the purposes of this chart, the peak hour is assumed to be 10 percent of AADT.
4. Noted additional factors include a selection of considerations that may influence the selection of bicycle facility type where roadway speed/volume values overlap over multiple facilities. Many of the factors that suggest increasing separation are common across multiple facility types like bike lanes, buffered bike lanes, and cycle tracks. Design guidance for shared use paths can be found in the AASHTO Guide for the Development of Bicycle Facilities.
5. Increased separation of bicycle facilities from motor vehicle traffic typically results in higher levels of user comfort and appeals to wider skill levels of bicyclists.
6. This chart considers posted speed limit only. The 85th percentile speed may vary, and may change with implementation of a bikeway.
APPENDIX

APPENDIX B | RAW NACTO ANALYSIS RESULTS
Des Moines Area Metropolitan Planning Organization
Complete Streets Policy

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 will apply to 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, 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.

5.3 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 Official’s (AASHTO) Guide for the Development of Bicycle Facilities;
- AASHTO’s A Policy on Geometric Design of Highways and Streets;
- Federal Highway Administration’s Manual on Uniform Traffic Control Devices for Streets and Highways; and,
- Institute of Transportation Engineer’s (ITE) Recommended Practice – Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities.
- Des Moines Area MPO Design Standards Policy.

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.

6.4 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