

DES MOINES METRO AREA
INTEGRATED CORRIDOR MANAGEMENT (ICM)

Interstate Median Barrier Gate Concept of Operations
July 31, 2019



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Figure 1: Des Moines Metropolitan Area ICM Program Area 5

1 Introduction

This document details the Concept of Operations (ConOps) for Median Barrier Gates developed as part of the Des Moines Metropolitan Area Integrated Corridor Management (ICM) Program. The ICM Program was developed to proactively address current and anticipated instances of congestion along transportation corridors in Des Moines. The Iowa Department of Transportation (DOT), in cooperation with regional stakeholders, has identified the installation of median barrier gates as a priority strategy within the context of ICM.

1.1 PROJECT BACKGROUND AND UNDERSTANDING

During the development of the Des Moines Metropolitan Area ICM Program, stakeholders prioritized a number of strategies that could be implemented to support the ICM vision and goals of the ICM Program, including safety, mobility, reliability and accessibility. Solid median barriers on I-35, I-80, I-35/80 and I-235 prevent responders from utilizing the median to turn around and access incidents in the opposite direction of travel. Additionally, the long distances between interchanges leads to increased response and clearance time of incidents.

Median barriers improve safety by separating opposite directions of traffic and preventing vehicles from crossing the median during a crash, they also prevent unauthorized turnarounds. In addition to stopping these unwanted crossings of the median, the barriers also prevent first responders from accessing the scene of an incident when approaching from the opposite direction. Given the long distance between interchanges on some segments of the interstate, this can mean 10 miles of additional round-trip travel by responders.

1.1.1 What are Median Barrier Gates?

Median barrier gates are breaks in the solid concrete or cable median barrier that are secured when not in use to prevent unauthorized access. Median barrier gates are intended to be easy to operate without the use of specialized tools or equipment, and located in areas where access is difficult and incidents are likely to occur.

Existing Interstate Median Barrier Gate



1.1.2 Why are Median Barrier Gates Important?

When a serious accident occurs, quick access to the scene by first responders can mean the difference between life and death. The quicker responders can arrive at and manage an incident, the quicker that incident can be cleared, lowering the chances of secondary crashes and allowing traffic to return to free flow conditions.

1.2 PROJECT SCOPE AND UNDERSTANDING

This Median Barrier Gates ConOps for the Des Moines ICM Program will provide the documentation of stakeholder needs, operational goals, design decisions and a description of the potential uses and benefits of secured median crossovers on interstate roadways in the metro area. The document is written so that all stakeholders, regardless of their background, can easily understand where in the framework they fit and what general responsibilities they have in the activity. The ConOps is written in a non-technical manner so that each stakeholder has the opportunity to understand the barrier gate concept and the ability to provide feedback on this concept. The ConOps fosters an environment where stakeholders can collaborate to exchange ideas and gain consensus on how to proceed with implementing the median barrier gate concept.

1.2.1 Project Schedule

As part of the ICM effort, stakeholders and the public have been engaged in a series of activities that began in October 2018. The following is a list of the activities undergone as part of this programmatic effort and which provided input for this document:

- Stakeholder Kick-off Meeting (October 2018)
- Stakeholder Visioning Workshop (November 2018)
- Public Scoping Meeting (January 2019)
- Stakeholder ConOps Workshop (March 2019)

A stakeholder working group focused on median barrier gates was held during the development of this ConOps and met to provide guidance, answer technical questions, and review proposed approaches to placing and utilizing median barrier gates. Additionally, follow up phone interviews with stakeholders who were unable to attend the working group were conducted.

1.2.2 Project Boundaries

The Des Moines Metropolitan Area ICM Program is a regional effort focusing on key corridors within the Des Moines region. The Median Barrier Gate Project is an element of the overall ICM Program. It is focused on interstates (I-35, I-80, I-35/80, and I-235) in the Region. The project area is shown in Figure 1.

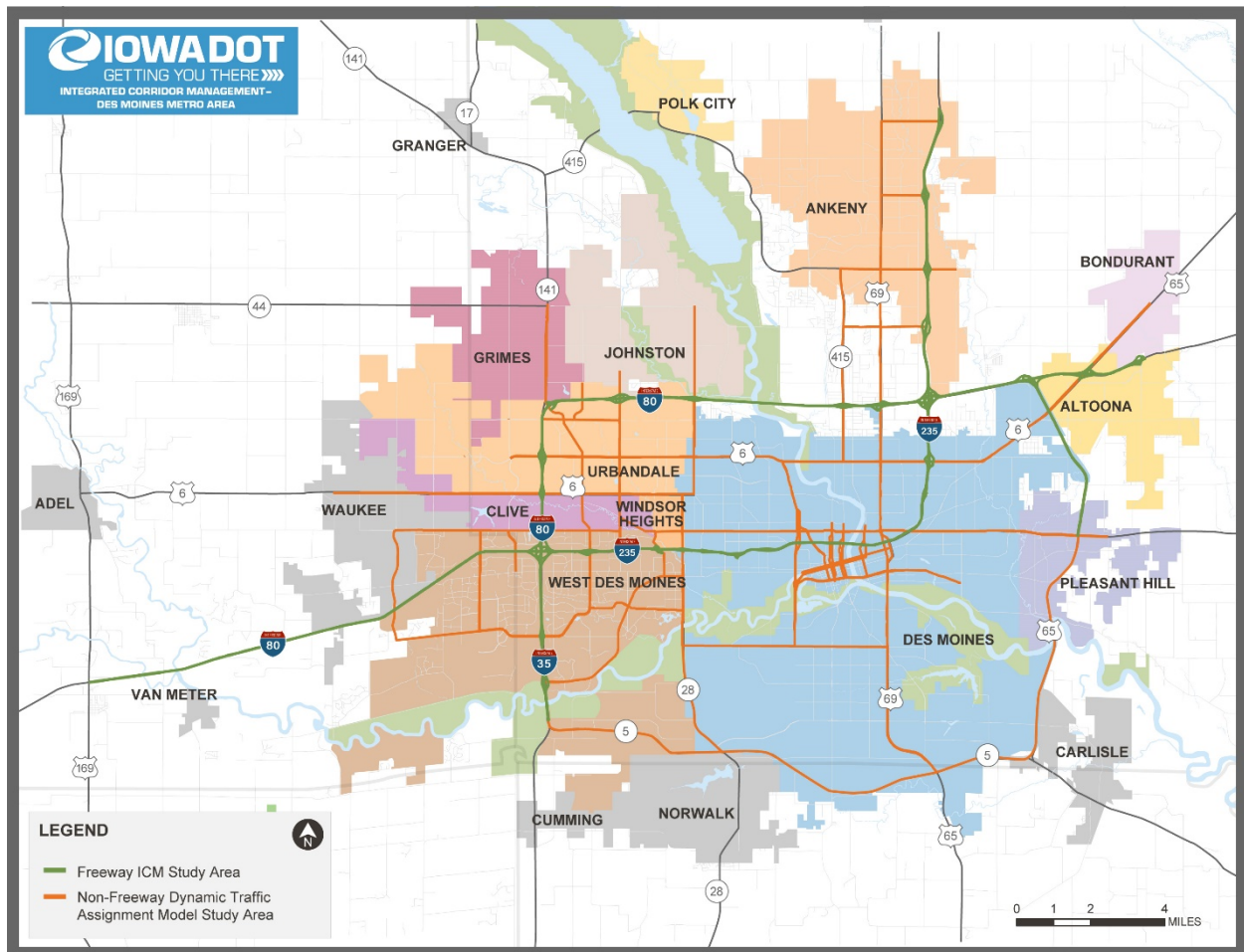


Figure 1: Des Moines Metropolitan Area ICM Program Area

1.3 DOCUMENT SCOPE AND UNDERSTANDING

1.3.1 What is a Concept of Operations?

Ultimately, this project-level ConOps answers the who, what, when, where, why, and how questions regarding interstate median barrier gates.

- Who? — Identifies the various agencies or people involved in the process.
- What? — Identifies the known system components/elements and high-level capabilities required. Note this is with respect to all elements of the system—whether human or machine (hardware/software).
- When? — Identifies the activities and tasks of the process, including any required time sequence (precedence, concurrence), and operations under various conditions.
- Where? — Describes the physical and geographic location and environment.
- Why? — Explains the reasoning behind specific sequences or partitioning of tasks (e.g., policies, skill sets).
- How? — Wraps together all the above to explain how the process is to function.

Project Level Concept of Operations

This document serves as a project-level ConOps, describing how an individual ICM strategy will work to meet the high-level ICM vision and its corresponding goals and objectives.

This Project-Level ConOps focuses on the specific operational needs of accessing incidents that occur on the interstate and identifies roles and responsibilities for planning, implementing, operating, and maintaining the strategy. The ConOps is not static and will need to be updated as new information arises during the life of the ICM Program.

Program Level and Project Level Concept of Operations Relationship

A program-level ConOps was prepared for the overarching ICM effort and serves as the framework for future projects and efforts. The Program-Level ConOps focuses on the overall vision and objectives of the ICM Program, provides an area-wide perspective, describes how various strategies will work together, and describes how the ICM Program will be managed. The Program Level ConOps is designed to reduce agency burden in developing ICM projects by providing information and understanding common to most or all ICM projects. The Program Level ConOps is available for download at <https://iowadot.gov/desmoinesicm/pdf/DesMoines-ICM-ProgramConOps.PDF>

The project level ConOps identifies project specific details not found in the program level ConOps. As project champions use this Interstate Median Barrier Gate Project ConOps, they will need to refer to the Program-Level ConOps to verify the larger goals and objectives are being met and to determine how other strategies can be integrated. While each Project-Level ConOps is a standalone document, the program-level ICM ConOps will assist in connecting the different ICM strategies and efforts.

1.3.2 Development Process and Approach

Stakeholder involvement was essential in the development of the Project Level ConOps as consensus is needed related to goals, objectives, and responsibilities of the project and its members.

The Median Barrier Gate ConOps was developed using a disciplined systems engineering approach. Systems engineering is a method to facilitate the development, maintenance, refinement, and retirement of dynamic systems comprising both technological components (machines, information systems, etc.) and

human components (users, stakeholders, etc.). Within the systems engineering approach, the ConOps is typically one of the earlier stages and serves as the principal guidance document for future steps within the design process.

Stakeholder Outreach

Stakeholder involvement is key to developing consensus on the operation of a system or subsystem. As part of the Program-Level ConOps process, a Stakeholder and Public Engagement Plan was developed that outlined specific steps, methods, and timeframes for outreach with the goal to actively identify and engage key stakeholder audiences and the general public throughout the ICM development process.

As part of the project-level ConOps, stakeholder involvement focused on a smaller subset of groups or individuals who are focused on interstate incident response. A stakeholder meeting with this working group was held on June 13, 2019 to discuss current agency capabilities and to solicit input into this proposed process. Additional follow up phone interviews with agencies who were not able to attend were also conducted. Meeting minutes are provided as an appendix. A list of stakeholder agencies is included in Section 5 of this document.

1.3.3 Audience

The following groups or categories of audience members have been identified for this document:

- Elected officials
- Transportation agencies
- Metropolitan planning organizations
- Law enforcement
- Emergency responders (fire, medical, tow operators)
- Transit providers
- Engineering firms
- Professional organizations
- Commercial vehicle operators and organizations
- Road users/general public

Within each of the above groups or categories, there are multiple types of audiences such as policy-makers, managers, engineers or designers, operators, maintenance workers, construction workers, manufacturers or suppliers, and others. While this list is fairly exhaustive, it is important to consider all potential users to capture input or consider perspective in the early stages of the systems engineering process.

1.3.4 Document Contents and Organization

This document generally follows the high-level outline structure that has been developed for ConOps efforts. A brief description of each section is provided below.

Section 1: Introduction- This section introduces the ICM project, describes its scope, and provides the reader with an understanding of what a ConOps is. It lays the framework required by the reader to understand remaining sections of the document.

Section 2: Reference Documents - This section lists the references used in the development of this document and serves as a source that readers may use to obtain additional details on aspects of the project.

Section 3: Situational Background - This section describes how agencies currently access incidents on the interstate and what limitations agencies experience. It provides the underlying argument in support of the median barrier gate project and how it can meet identified goals.

Section 4: Operational Needs - This section identifies and summarizes agency needs and issues with respect to interstate incident scene access. Needs and Issues identified here will provide the basis for developing the median barrier gate concept.

Section 5: System Concept Operational Context and Understanding – This section describes how median barrier gates are expected to operate at a high-level. It explains how the concept will improve the operation of the Des Moines corridor overall and how it addresses stakeholder operational needs. Included are descriptions of the project purpose, goals & objectives, operational stakeholders, interfaces, information flows and ideal operations.

Section 6: Operational Environment - This section discusses the physical operational environment. Within the Project-Level ConOps, the focus will be those items specific to emergency responder access to incidents on the interstate. Items discussed here are generally considered mandatory for operating the proposed gates.

Section 7: Support Environment - This section discusses other non-physical assets that may be leveraged in support of the barrier gates, such as standard operating procedures, policies, funding, legislation, education and training, memorandums of understanding, maintenance procedures, etc.

Section 8: Operational Scenarios - This section describes how the operation of median barrier gates will occur given a number of operational scenarios. The scenarios discussed include: normal operations and incident operations.

Section 9: Analysis of Proposed System - This section describes the anticipated impacts that may result from the project's implementation. Impacts will be organized by type to include operational, organizational, and other impacts.

2 Referenced Documents

The following resources have been referenced in development of this document:

- Congestion Management Process, Des Moines Area Metropolitan Planning Organization, January 2016
- Des Moines Area Regional Intelligent Transportation Systems (ITS) Architecture Update, Des Moines Area Metropolitan Planning Organization, August 2009
- Transportation Systems Management and Operations (TSMO) Intelligent Transportation Systems (ITS) and Communications Systems Service Layer Plan, Iowa Department of Transportation, January 2018
- Transportation Systems Management and Operations (TSMO) Work Zone Management Service Layer, Iowa Department of Transportation, June 2018
- Iowa Transportation Systems Management and Operations (TSMO) Strategic Plan, Iowa Department of Transportation, February 2016
- Iowa Transportation Systems Management and Operations (TSMO) Program Plan, Iowa Department of Transportation, February 2016
- Integrated Corridor Management Plan: Existing Conditions Report, Iowa Department of Transportation, December 2018
- Integrated Corridor Management Plan: Vision, Goals, Objectives and Performance Measures Report, Iowa Department of Transportation, December 2018
- Integrated Corridor Management Plan: Range of Potential ICM Strategies Report, Iowa Department of Transportation, December 2018

3 Situational Background

The Des Moines Metropolitan ICM Study area includes many individual agencies and jurisdictions that work together to respond to incidents on various segments of the interstate system. One of the primary goals of incident response is the safety of responders and the travelling public. Quick clearance of an incident scene and the return to free flow traffic is one of the best ways to ensure this goal is met.

3.1 DESCRIPTION OF CURRENT SITUATION

There are multiple agencies and disciplines who respond to incidents on the interstate system. Depending on location, and in some locations the direction of traffic, response agencies can include township, municipal, county or state entities. Law enforcement, fire, emergency medical, transportation and towing are all disciplines that routinely respond to crashes and other incidents in the ICM Study area.

3.2 CHALLENGES AND OPPORTUNITIES

The goal of quick and safe clearance of incidents on the interstate is shared by all of the agencies engaged in the ICM process. When responding to incidents the various agencies cooperate to quickly and safely evaluate situations, treat the injured, protect responders, and mitigate the impact to traffic approaching the incident. The cooperative relationships between agencies required to meet this goal already exist and all stakeholders have indicated a desire to decrease response times.

By quickly clearing an incident the number and severity of secondary crashes can be lowered. Formal cooperative agreements exist to ensure coordinated response to incidents. Stakeholder agencies

indicated that on-scene coordination and cooperation is one of the primary strengths of the response efforts to incidents on the interstate in the Des Moines metro area. All levels of stakeholder agencies including executive leadership, administrative, dispatch, and on-scene responders are committed to working efficiently together for the benefit of the travelling public and the safety of responders.

4 Operational Needs

Des Moines sits at the intersection of two cross-country interstates, I-35 and I-80. The interstate system within the project area has some of the highest traffic volumes in the state of Iowa and crash rates above the statewide average.

Iowa DOT has identified non-recurring congestion, including traffic incidents, as the primary cause of delay within Iowa. Traffic incidents, such as crashes, impact not only the individuals directly involved, but also the other travelers on the transportation system as well as the responders who help clear the incident. Quickly and safely clearing incidents and returning traffic to efficient free flow conditions is a goal shared by all stakeholder organizations.

As incident time increases, so does the likelihood of secondary crashes. Secondary crashes are often more severe and cause more damage and injury than the original incident. Clearing an incident quickly can reduce the chances of these secondary crashes. In order to clear incidents, quick and safe access to incident scenes is required.

Access to incident locations was identified as one of the largest challenges to the quick and safe clearance of incidents. The long distances between interchanges, solid concrete median barriers and the complex geometrics of system interchanges (e.g., northeast mix-master) can add minutes to the response time. In the worst case, the additional response time can literally be the difference between a serious injury accident and a fatality; and at a minimum it can increase the time for incident response and a return to free flow traffic.

Currently, if a responder approaches an incident on the interstate from the opposite direction of travel, they must drive to the next interchange to turn around, adding up to 10 miles of round-trip travel. If the incident is blocking traffic a responder may need to drive on the shoulder and weave in and out of traffic to access the scene. Stakeholders have indicated that if a safe and convenient turnaround location (i.e., breaks in the barrier wall) was available they would use it, cutting down the time of response to provide aid to those involved in a crash and limit the subsequent delay by clearing an incident more quickly.

5 System Concept Operational Context and Understanding

The Interstate Median Barrier Gate Project is one of several early implementation strategies under the Des Moines Metropolitan Area ICM Program. This particular strategy will be defined by the following vision, goals and objectives, and description. For a wider understanding of the overall ICM effort, the Program-Level ConOps provides a broader context.

5.1 VISION

The vision of the overall Des Moines Metropolitan Area ICM Program is contained in the Program-Level ConOps document and applies to all future strategies/effort. Relative to the Interstate Median Barrier Gates Project, the portion of the overall vision that is most applicable and relevant is:

“ICM strategies will assist the state and area communities to proactively manage multi-modal transportation systems in a safe and efficient manner using proven technologies and operational strategies while maximizing the use of existing infrastructure and services.”

The median barrier gates project relies on strategies to proactively manage the transportation system in a safe and efficient manner. The resulting improvement in operations will improve incident response time thereby increasing traveler safety and system reliability.

5.2 PROJECT GOALS AND OBJECTIVES

The Des Moines Metropolitan Area ICM Program developed goals and objectives for the entire effort. Of the goals and objectives listed in the Program-Level ConOps, the following are applicable to the median barrier gate project:

Goal: Reduce fatalities and serious injuries on public roads in the region.

Objectives: Reduce number of traffic fatalities.

Reduce number of serious injuries in traffic crashes.

Goal: Provide options to travelers that minimize time spent traveling.

Objectives: Reduce congestion in key commuter corridors.

Reduce congestion in key freight corridors.

Goal: Improve efficiency and predictability of travel in the region.

Objectives: Reduce the variability of travel time on key commuter routes and modes.

Goal: Improve the efficiency of the surface transportation system.

Objectives: Implement advanced operational strategies along priority commuter and freight corridors.

5.3 STAKEHOLDERS

The primary stakeholders for the median barrier gates project will be those agencies involved in traffic incident management along the freeway system in the ICM study area. The following stakeholders will be involved:

- State/Regional/Federal Transportation Management
 - Iowa Department of Transportation
 - Iowa State Patrol
 - Des Moines Area Metropolitan Planning Organization
 - Federal Highway Administration - Iowa Division

- Local Municipality Law Enforcement/Fire & Rescue/Emergency Response
 - City of Altoona
 - City of Ankeny
 - City of Bondurant
 - City of Clive
 - City of Des Moines
 - City of Grimes
 - City of Johnston
 - City of Pleasant Hill
 - City of Urbandale
 - City of Waukee
 - City of West Des Moines
 - City of Windsor Heights
 - Dallas County
 - Delaware Township
 - Douglas Township
 - Polk County
 - Saylor Township
 - Warren County
- Towing
 - Multiple private companies

Within each of these agencies or organizations, it is expected that a range of members will be involved. Related to median barrier gates, it is anticipated that agency law enforcement, fire & rescue, other emergency responders and maintenance staff will have roles in operations and maintenance of the median barrier gates.

5.4 SYSTEM CONCEPT DESCRIPTION

The Interstate Median Barrier Gate Project will require a new approach to traffic incident management procedures to support ICM Program goals. As previously described in Section 4, the project needs include the ability for emergency responders to more safely, quickly and efficiently access incident scenes to provide medical assistance, as needed, and quick clearance of the incident. The following discussions outline a high-level concept that provides the processes, steps, and requirements of the proposed strategy.

5.4.1 Locations

Identifying the locations to place the median barrier gates will be critical to the effectiveness of the gates meeting the goals and objectives. The following criteria should be considered to identify potential locations for the gates along the freeway system in the ICM study area:

- Areas with long distances between interchanges
- Areas without existing median breaks
- Areas with complex interchange configurations (e.g., northeast and southwest mixmaster)
- Locations with high frequency of incidents

- Input from response agencies

5.4.2 Operations

The median barrier gates will need to prevent unauthorized users (e.g., general public) from using the break, while maintaining ease of use for the authorized users. The following are considerations in regards to the security and ease of use:

- Should be crashworthy
- Should maintain continuity of the existing median barrier and not increase risk to the system users
- Should be able to operate the gate in timely manner
- Need to prevent unauthorized users from using the break in the median barrier
- Should not include complex mechanisms, special tools or keys in order to operate
- Should be able to operate the gate with a single person
- Should be able to accommodate authorized vehicles (e.g., fire engine, ambulance, tow truck, law enforcement vehicles)
- Should not be left open without emergency personnel managing gate access

The usage of the median barrier gates will be restricted to certain conditions and incident commander on the scene will determine the usage of the gate. The following are considerations for usage of the gate:

- During incidents on the freeway which are causing backups
- Emergency vehicle access to the incident is hindered using other routes
- Freeway traffic is slowed to a speed where emergency vehicles can use the gate safely
- Restrict vehicle access only to emergency response vehicles including:
 - Fire engines
 - Ambulance
 - Law enforcement vehicles
 - Highway Helper
 - DOT maintenance vehicles
 - Tow trucks

5.4.3 Maintenance

Routine maintenance on the median barrier gates will be required to make sure they are in working order. A maintenance schedule along with a checklist of maintenance items will be developed. Special considerations for winter maintenance activities will need to be developed.

6 Operational Environment

The physical operational environment associated with the median barrier gates project includes the gates, personnel, emergency vehicles, operational procedures and support necessary to operate the ICM strategy.

The median barrier gate is the primary physical component for this project. Key components of the median barrier gate include the following:

- Gate – which creates a physical barrier to prevent a break in the median

- Operating mechanism – which allows for the gate to be opened and closed
- Security mechanism – which prevents unauthorized use of the median barrier gate

Personnel associated with the median barrier gates project includes emergency responders and maintenance personnel. Emergency responders will be the operators of the median barrier gates and the maintenance personnel will provide maintenance on the gates.

7 Support Environment

The support environment associated with the overall Des Moines Metropolitan Area ICM program, including the management structures and non-physical assets that support the program, is detailed in the Program-Level ConOps. Management will consist of an Executive Committee, a Technical Committee, Technical Subcommittees, and a Steering Committee. With respect to the Median Barrier Gates Project, these groups will guide and approve much of the activity.

7.1 EXECUTIVE COMMITTEE

The Executive Committee will largely provide oversight of the program and assign funding levels for the particular efforts/projects. As stated in the Program-Level ConOps, it is likely that this membership will closely follow the Des Moines Area MPO Executive Committee. For the Median Barrier Gate Project, this committee will provide strategic direction, identify the annual resources (funding) available, and approve any work plan or scope provided by the Technical Committee. Interaction with this group will be limited to high-level decisions and not focus on individual median barrier gates.

7.2 TECHNICAL COMMITTEE

The Technical Committee will be the primary decision-making body associated with the Median Barrier Gate Project. As stated in the Program-Level ConOps, it is likely that this membership will closely follow the Des Moines Area MPO Transportation Technical Committee. This group will allocate funds and establish projects that align with the goals and objectives of the ICM program. The Technical Committee will manage the external consultant process and develop recommendations for the Executive Committee.

7.3 TECHNICAL SUBCOMMITTEE

The Technical Subcommittee will consist of members from the individual agencies that have technical expertise in traffic incident management. This will be the day-to-day working group that will establish performance measures, an evaluation process, and facilitate the prioritization of the identified locations. It is anticipated that this group will be comprised of members from the Des Moines Area Traffic Incident Management group. Recommendations from this subcommittee will be submitted to the Technical Committee for review.

7.4 STEERING COMMITTEE

The Steering Committee represents the broadest set of ICM stakeholders and helps set the vision, goals, and objectives of the ICM Program. This group will be comprised of any person that has an interest in providing input on ICM-related matters. The Steering Committee will meet less frequently than the other groups and will not be a decision-making entity. Issues and needs raised by Steering Committee members should feed into programmatic update cycles and should be reflected at the program-level.

8 Operational Scenarios

8.1 SCENARIO #1: NORMAL OPERATIONS

The median barrier gates under normal operations will remain closed with secure access. Maintenance personnel will conduct routine maintenance and check the operations of the median barrier gates on a regular scheduled basis.

8.2 SCENARIO #2: INCIDENT ON I-80/I-35 WESTBOUND

A semi-truck is overturned on I-80 westbound just east of the Merle Hay Road interchange. The overturned semi-truck is blocking the inside two lanes of the interstate.

1. Incident Detection
 - a. A call is received by the 911 dispatcher regarding the incident.
 - b. The dispatcher uses the CCTV cameras to verify the location and magnitude of the incident.
 - c. Emergency personnel are dispatched to the scene.
2. Initial Access to Scene
 - a. Law enforcement is the first to arrive on scene by using the inside shoulder to pass the backed up traffic.
 - b. Upon arrival, fire & rescue are dispatched to the scene.
3. Rescue Response to Scene
 - a. Westbound traffic has backed up the approximately 1 mile, just beyond the median barrier gate.
 - b. Law enforcement coordinates with the en-route eastbound ambulance to use the median barrier gate.
 - c. Ambulance uses the median barrier gate by opening the gate, conducting a u-turn through the median opening and closing/securing the gate.
 - d. Ambulance accesses the scene using the westbound inside shoulder.
4. Tow Response to Scene
 - a. Westbound traffic has now backed up approximately 2 miles.
 - b. Tow and recovery is contacted to remove the semi-truck from the through lanes.
 - c. Law enforcement coordinates with en-route eastbound tow truck to inform them to use the median barrier gate.
 - d. Iowa DOT highway helper opens the gate for the tow truck, the tow truck makes a u-turn through the median opening and the highway helper closes/secures the gate.

9 Analysis of the Proposed System

9.1 SUMMARY OF IMPACTS

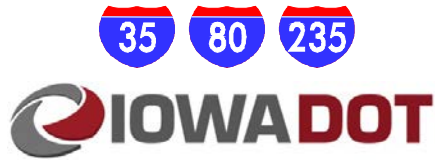
9.1.1 Operational Impacts

Operational impacts from the median barrier gates project will center around incident response time by emergency responders. The most visible benefit will be a quick clearance which result in reduction in secondary crashes and associated congestion. The reduced response time to incidents also allows quicker response by fire and rescue to respond to injuries.

9.1.2 Organizational Impacts

Organizational impacts from the median barrier gates will center around enhanced traffic incident management capabilities. The implementation and use of the median barrier gates will increase the awareness and discussion of traffic incident management practices and procedures.

Appendix



INTEGRATED CORRIDOR MANAGEMENT (ICM) – DES MOINES METRO, IA
Median Barrier Gate Concept of Operations Stakeholder Workshop
Thursday, June 13, 2019 – 9:30 AM – 11:00 AM
300 E Locust– Des Moines

MEETING MINUTES

Goal of Meeting – Solicit and document stakeholder needs in relation to potential Median Barrier Gate (MBG) project.

Attendees

Gary Kretlow	Iowa DOT District 1
Neal Fobian	Iowa DOT Location and Environment
Jared Smith	Iowa DOT Traffic Operations
Sgt. Ryan King	Des Moines Police Department
Jon Markt	HDR
Brian Ray	HDR
Tony Taylor	HDR

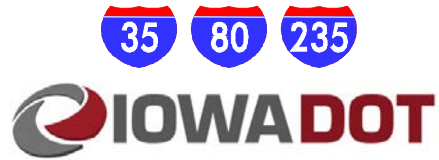
Discussion- Median breaks vs. median gate consensus was breaks are not desired unless they can be secured or ‘hidden’ to prevent unauthorized access (e.g., overlapping entrances). Concern of general public using, specifically during incidents if stuck in traffic. Will require securing the crossing by law enforcement or closing gate during incident to prevent unauthorized crossing.

Primary considerations are locations where major roadways with high volume meet (northeast and west mix-master) or long distance to nearest interchange. High-incident locations (e.g., I-235) won’t be a primary factor considered because distance between interchanges is much shorter and there are multiple access options for first responders.

Once locations are determined the primary design consideration is to accommodate turning radius of fire trucks and other emergency personnel (e.g., ambulance). Largest equipment is a ladder truck, but smaller engines are more typical- similar turning radius to a large DOT maintenance truck. Law enforcement typically on-scene earlier in the incident and their vehicles can more easily utilize the shoulder to access the scene is easier. Towing is secondary, their equipment is smaller and they typically arrive much later in the incident although they may also utilize.

Usage will be limited to access for incidents only (not for traffic enforcement, maintenance activities or convenience). On-scene commander, typically fire (since captains ride in trucks), should be the one to decide whether to use gates. Gates should be used only for full closures where access is extremely difficult and/or when a longer term closure is anticipated (e.g., serious injury, fatality).

Will need to limit who can open the gate once the decision to use them is made. Law enforcement, fire, Highway Helper will be the most likely authorized users. If locks are used there will need to be copies distributed to specific key staff or assigned to an agency for their shared use (i.e., checked out on a daily basis). Estimated the total number of keys required would be > 50.



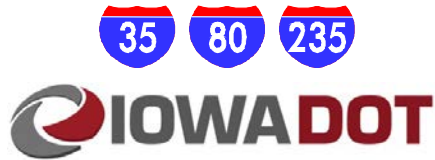
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Winter maintenance activities need to be considered. DOT salt/brine will corrode machinery so it should be avoided.

Group agreed that all (multi-disciplinary) agencies, particularly those most likely to need/utilize the gates (e.g., fire, ambulance), need to be engaged in the discussion to ensure their needs and concerns are addressed.

Next Steps

- Contact stakeholders not in attendance
- HDR to develop draft Median Barrier Gate Project (MBG) Concept of Operations (ConOps) and submit to Iowa DOT
- Distribute draft MBG ConOps to stakeholders following Iowa DOT review



INTEGRATED CORRIDOR MANAGEMENT (ICM) – DES MOINES METRO, IA
Median Barrier Gate Concept of Operations
Conference Call with Ankeny Fire Department
Thursday, June 27, 2019 – 10:30 AM – 11:30 AM

MEETING MINUTES

Goal of Meeting – Solicit and document Ankeny Fire Department's (AFD) needs in relation to potential Median Barrier Gate (MBG) project.

Attendees

Deputy Chief Frank Prowant- Ankeny Fire Department
Captain Adam VanderLeest- Ankeny Fire Department
Brian Ray- HDR
Tony Taylor- HDR

Discussion- HDR provided a summary of 6-13-19 Stakeholder.

Depending on location AFD is the primary responding agency

- I-35 north of the mix
- Dependent on direction of travel on I-35 inside the mix
- I-80 between mix and US 65/IA 5

Primary limitation on quick response on I-35 NB is the long distance between interchanges- 10-12 mile roundtrip between 126th Ave (Exit 96) and IA 210 (Exit 102)

Similar limit if responding to I-80 between Corporate Woods to mix to US 65/IA 5 (+/- 8-10 miles roundtrip)

Would only consider using median gates if traffic at a complete stop. Their vehicles do not have acceleration to enter moving traffic.

Largest equipment (ladder truck) would require shoulder and 1 ½ lanes to make the turnaround. Smaller trucks would use shoulder plus partial lane. AFD to provide turning radius for design purposes.

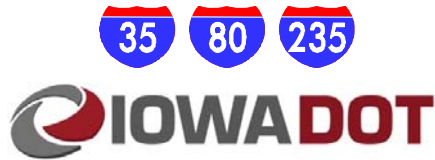
Preference is to NOT have keys. Concern with keeping track of them and the potential slowdown if it can't be immediately opened

Use of gates would be on on-scene or in route decision

Usage of gates would require change to departmental policy but this would not be a long duration process

Next Steps

- HDR to develop draft Median Barrier Gate Project (MBG) Concept of Operations (ConOps) and submit to Iowa DOT.
- Provide MBG ConOps to AFD for review following Iowa DOT review.



INTEGRATED CORRIDOR MANAGEMENT (ICM) – DES MOINES METRO, IA
Median Barrier Gate Concept of Operations
Conference Call with Iowa State Patrol
Friday, June 28, 2019 – 9:00 AM – 10:00 AM

MEETING MINUTES

Goal of Meeting – Solicit and document Iowa State Patrol (ISP) needs in relation to potential Median Barrier Gate (MBG) project.

Attendees

Sgt. Scott Bright	Iowa State Patrol- District 1
Brian Ray	HDR
Tony Taylor	HDR

Discussion- HDR provided a summary of 6-13-19 Stakeholder.

ISP is frequently the first on-scene.

The solid median barrier and the large distance between interchanges on I-80 from Merle Hay to US 65 plus geometry challenges at mixmaster are primary hurdles for access to incident scenes in the Des Moines metro.

I-235 (WDM) is a high incident area but interchanges are closely spaced and does not have the same needs

Although ISP can and does use turnaround at interchanges and driving on shoulder, a crossover would be very helpful and could decrease the response times by several minutes which could be a huge impact

Gates being secure when not in use will be a requirement but they must be easy to open and close, if it takes more than a minute or two they may not use. Keys are not desired as they are easily misplaced and require inventory management.

For ISP gates could be utilized at a trooper's discretion, no changes in ISP policy would be required.

Next Steps

- HDR to develop draft Median Barrier Gate Project (MBG) Concept of Operations (ConOps) and submit to Iowa DOT.
- Provide MBG ConOps to ISP for review following Iowa DOT review.