

# GUIDELINES FOR “EXPRESS TOLL LANE<sup>SM</sup>” SIGNING ON MANAGED LANES/ MANAGED FACILITIES

July 2008



Maryland  
Transportation  
Authority

Maryland Transportation Authority  
Division of Engineering  
300 Authority Drive  
Baltimore, Maryland 21222

Revision 2

**GUIDELINES**  
**FOR**  
**“EXPRESS TOLL LANE<sup>SM</sup>” SIGNING**  
**ON MANAGED LANES/MANAGED FACILITIES**

Maryland Transportation Authority  
Division of Engineering  
300 Authority Drive  
Baltimore, MD 21222

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*The Maryland Transportation Authority currently is pursuing efforts to brand and service mark the name Express Toll Lanes, the logo and the acronym ETLs. The service-mark symbol “SM” should appear on highway signage and in all documents.*



Maryland  
Transportation  
Authority

**Maryland Transportation Authority**  
**John D. Porcari, Chairman**

The attached Guidelines For "Express Toll Lane<sup>SM</sup>" Signing on Managed Lanes / Managed Facilities (July 2008) are hereby approved for use on Maryland Transportation Authority facilities.

Handwritten signature of Ronald L. Freeland in black ink.

Ronald L. Freeland  
Executive Secretary

Handwritten date 7/29/08 in black ink.

Date

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Handwritten date 07/17/08 in black ink.

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Handwritten date 07/17/08 in black ink.

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## **ACKNOWLEDGEMENTS**

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## 1. INTRODUCTION

### PURPOSE OF THIS DOCUMENT

Managed lanes and managed facilities are drawing increased attention from the transportation community. This increased level of interest has been driven by a desire to increase the efficiency of the surface transportation system (in terms of its ability to move people and goods), environmental concerns and funding considerations.

As interest in managed lanes and managed facilities grows, it is clear that traditional standards for signing and pavement markings, as found in the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), do not address all of the issues related to the design, construction and operation of these facilities. Research is underway to address these concerns; however, it is likely to be several years before definitive results emerge from that research.

As the Maryland Transportation Authority (MdTA) independently and/or in cooperation with the Maryland Department of Transportation considers the development of several “express toll lane” (ETL) managed lane and managed facility projects, establishing a consistent approach for signing and marking of the proposed managed lane and managed facility projects is necessary. The purpose of this document is to propose an interim set of guidelines. As research and testing results are received, it is anticipated that the MUTCD will establish a standard of practice, which will supersede these guidelines.

### DEFINITIONS OF MANAGED LANES

The Federal Highway Administration (FHWA) currently defines managed lanes as “...*highway facilities in which operational strategies are implemented and managed in real time in response to changing conditions*”.<sup>1</sup> Managed lanes are distinguished from other traditional forms of lane use restrictions in that they are proactively managed, and may involve using more than one operational strategy. The distinction between managed lanes and other traditional forms of freeway lane management is the operating philosophy of “active management”. Under this philosophy, the operating agency proactively manages demand and available capacity on the facility by applying new strategies or modifying existing strategies. The agency defines from the outset the operating objectives or “performance goals” for the managed lanes and the potential actions that will be taken once pre-defined performance goals are not met. Examples of performance goals include:

- Adjusting toll rates on a priced facility to maintain operating speeds of 60 mph;
- Adjusting occupancy requirements of a high occupancy vehicle (HOV) lane so that transit operating speeds of 50 mph can be maintained;
- Opening or closing a ramp to/from express lanes to stay below a volume threshold of 1500 vehicles per hour per lane.

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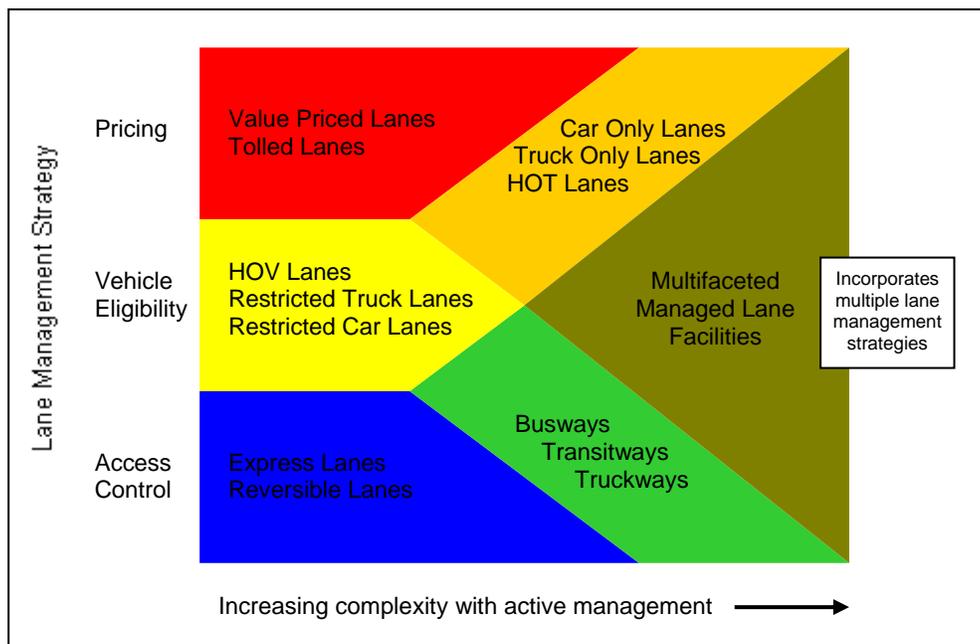
<sup>1</sup> Obenberger, Jon. “Managed Lanes”. Public Roads, November/December 2004.

There are several types of managed lanes, although several common themes are maintained in each type definition. These common themes include:

- Design: “freeway-within-a-freeway” or “parallel roadways”--managed travel lanes are physically separated from the general travel lanes or provide an alternative to existing, parallel transportation facilities.
- Operation: “flexibility”--management strategy is adjusted over a period of time in response to growth and changing traffic conditions.
- Operation: “diversity”--multiple operational techniques and strategies are used to meet specific performance goals. Management strategies are currently categorized in three groups: pricing, vehicle eligibility, and access control.

A consistent theme with each of the various definitions of managed lanes and managed facilities is the proactive implementation of an operational strategy in a response to changing traffic conditions. This theme is shown in **Figure 1.1** with the various lane management strategies. (**Figure 1.1** is a modified version of an exhibit from another document.<sup>2</sup>)

**Figure 1.1**  
**Lane Management Strategies**



<sup>2</sup> Texas Transportation Institute. Managed Lanes - A Cross-Cutting Study, November 2004.

## **Definitions**

For the purposes of this document, and consistent with the information provided above:

A managed lane is a roadway lane on which an active management strategy is implemented for the purpose of meeting specific performance goals. Managed lanes may be barrier-separated from the general purpose lanes. An example of a managed lane would be a variably-priced lane where the price is adjusted based upon real-time operating speeds.

A managed facility is a roadway with all managed lanes.

There are three types of interchanges with managed lanes, which are defined as follows:

A managed lanes only interchange is an interchange at which there is access and/or egress only for the managed lanes to/from the interchanging roadway. There is neither access nor egress for any general purpose lanes on the facility upon which the managed lanes are located.

A general purpose lanes only interchange is an interchange at which there is access and/or egress only for general purpose lanes to/from the interchanging roadway. There is neither access nor egress for managed lanes on the facility upon which the managed lanes are located.

A combined managed lanes / general purpose lanes interchange is an interchange at which there is access and/or egress for both managed lanes and general purpose lanes to/from the interchanging roadway.

## **SOURCE DOCUMENTS**

The primary source document for this set of guidelines is the 2003 Edition of the *Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)*. These guidelines are intended to be consistent with the MUTCD.

## **2. MOTORIST DECISION-MAKING**

### **INTRODUCTION**

By definition, managed lanes and managed facilities may operate differently at different times. It is desirable to provide as much real-time information as practical to the motorist regarding the management strategies currently in operation.

It should be noted that the remainder of this chapter addresses a management strategy based on variable pricing. If a different management strategy is selected for a particular facility, the desired information fields (shown in **Figures 2.1, 2.2** and **2.3** and described in **Tables 2.1** and **2.2**) which are related to cost / benefit for use of the managed lane or facility should be modified to reflect the selected type(s) of management strategies.

### **DECISION-MAKING FOR MANAGED LANES AND MANAGED FACILITIES**

As a motorist approaches a managed lane or managed facility, they are faced with the following decision: Am I going to use the managed lane or managed facility? In order to make that decision in a rational manner, the motorist must weigh a number of factors in real time. The Texas Transportation Institute has studied the factors which the motorist might want to consider, and has developed the conceptualized traveler decision model shown in **Figure 2.1**.<sup>3</sup>

**Figure 2.1** reveals that some of the information in the “Desired Information” boxes does not vary, and could be provided to the motorist through static signing. Some of the information varies over time, and can perhaps be more clearly conveyed to the motorist by means of dynamic message signs. Finally, some of the information (such as “Desire to Avoid Late Arrival” cannot be displayed through signing at all. It is important to note that this is a list of desired information and does not mean that any or all of the information categories are required for safe operation of the managed lane or managed facility.

The “Desired Information” was divided into the three categories discussed in the preceding paragraph, resulting in **Figure 2.2**. Further discussion of the potential information to be shown on dynamic message signs is provided in **Table 2.1**.

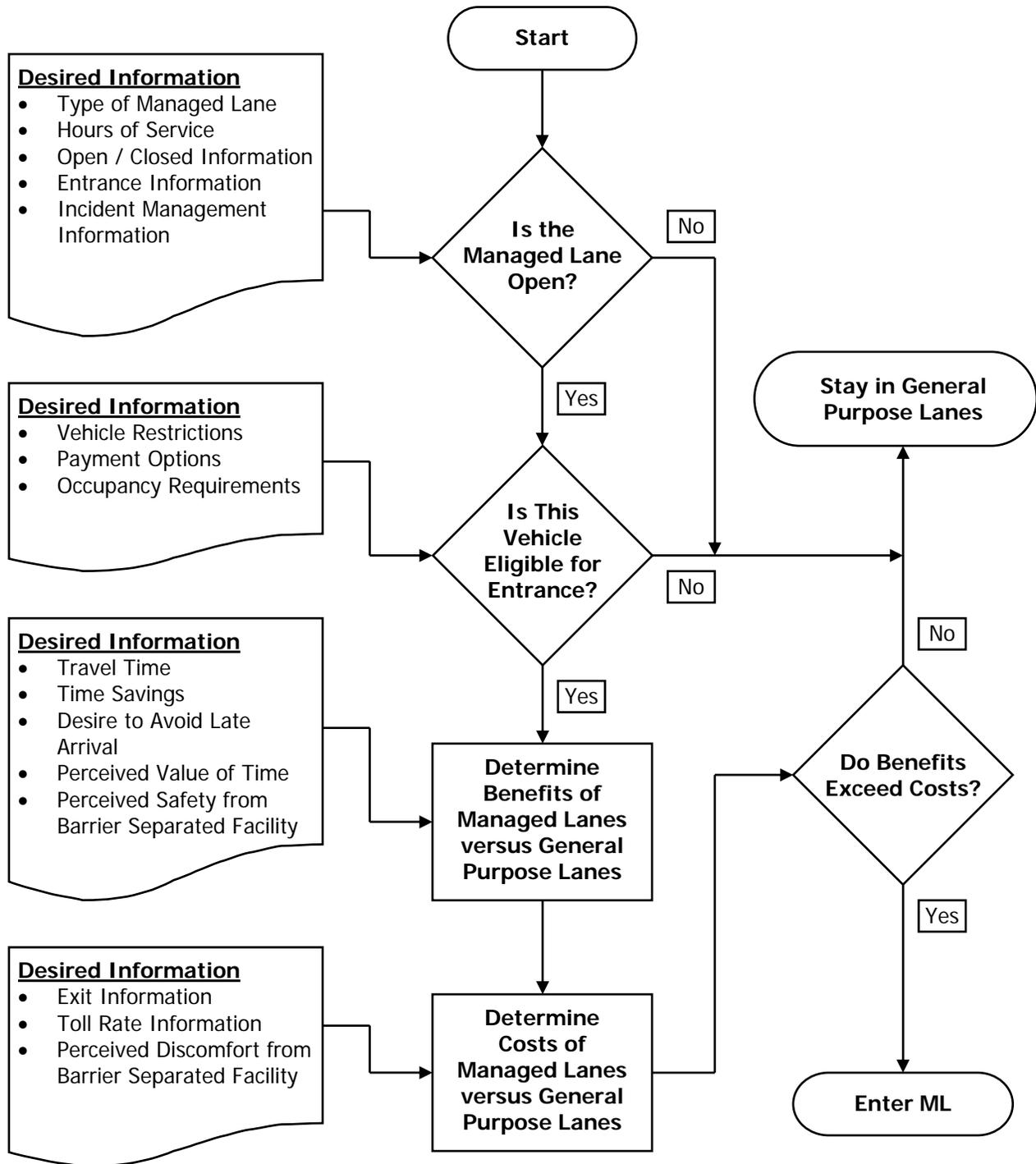
### **DECISION-MAKING FOR MANAGED FACILITIES**

While the model shown in **Figure 2.1** is directly applicable to managed lanes, it requires slight modification in order to be applicable to managed facilities. These modifications are shown in **Figure 2.3**, with further discussion of the information which might be shown in dynamic message signs being provided in **Table 2.2**.

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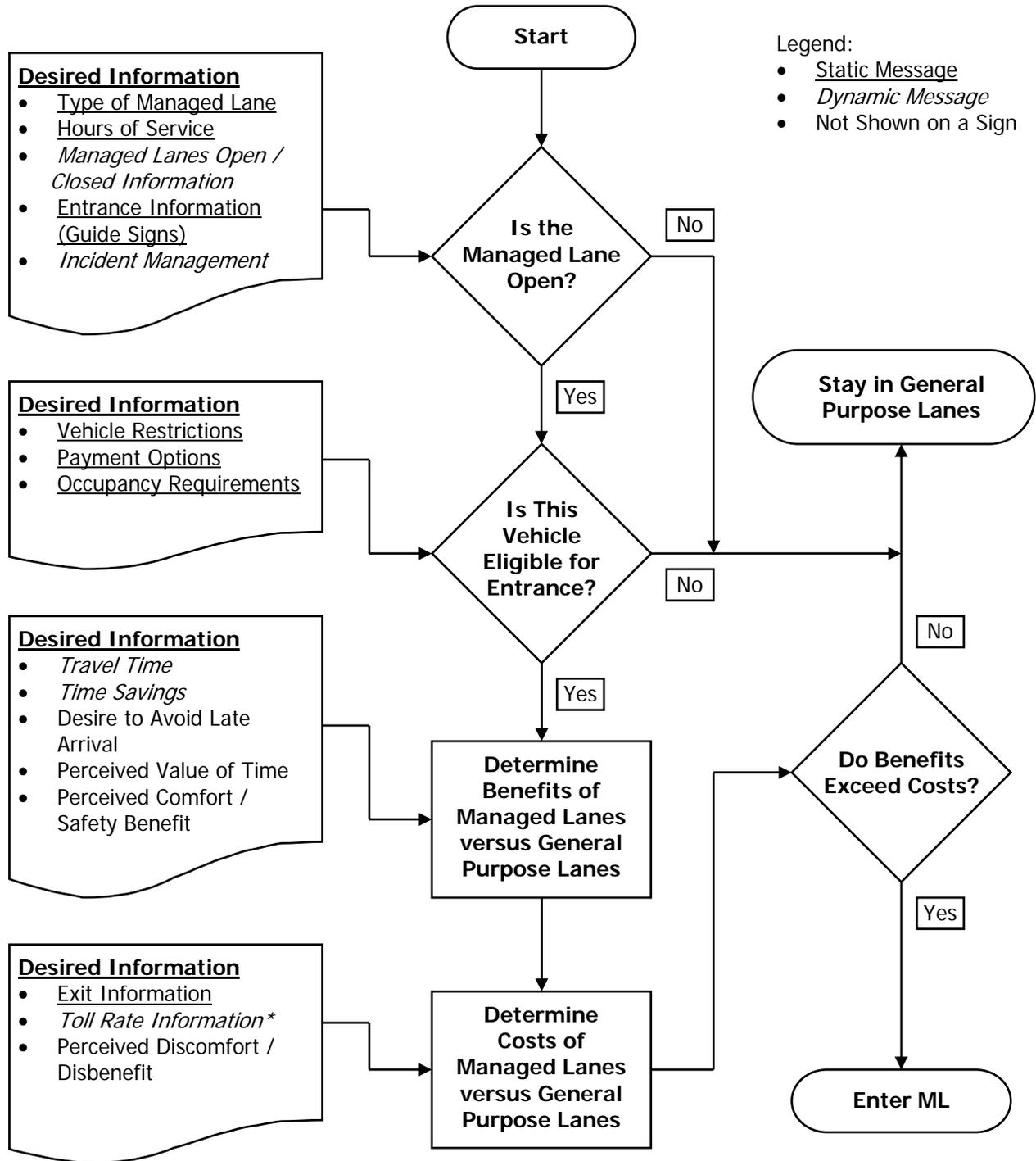
<sup>3</sup> Project 0-4160: Operating Freeways with Managed Lanes. Project Bulletin 4160-13B. Texas Transportation Institute.

**Figure 2.1**  
**Project 0-4160 (Texas Transportation Institute)**  
**Conceptualized Traveler Decision Model**



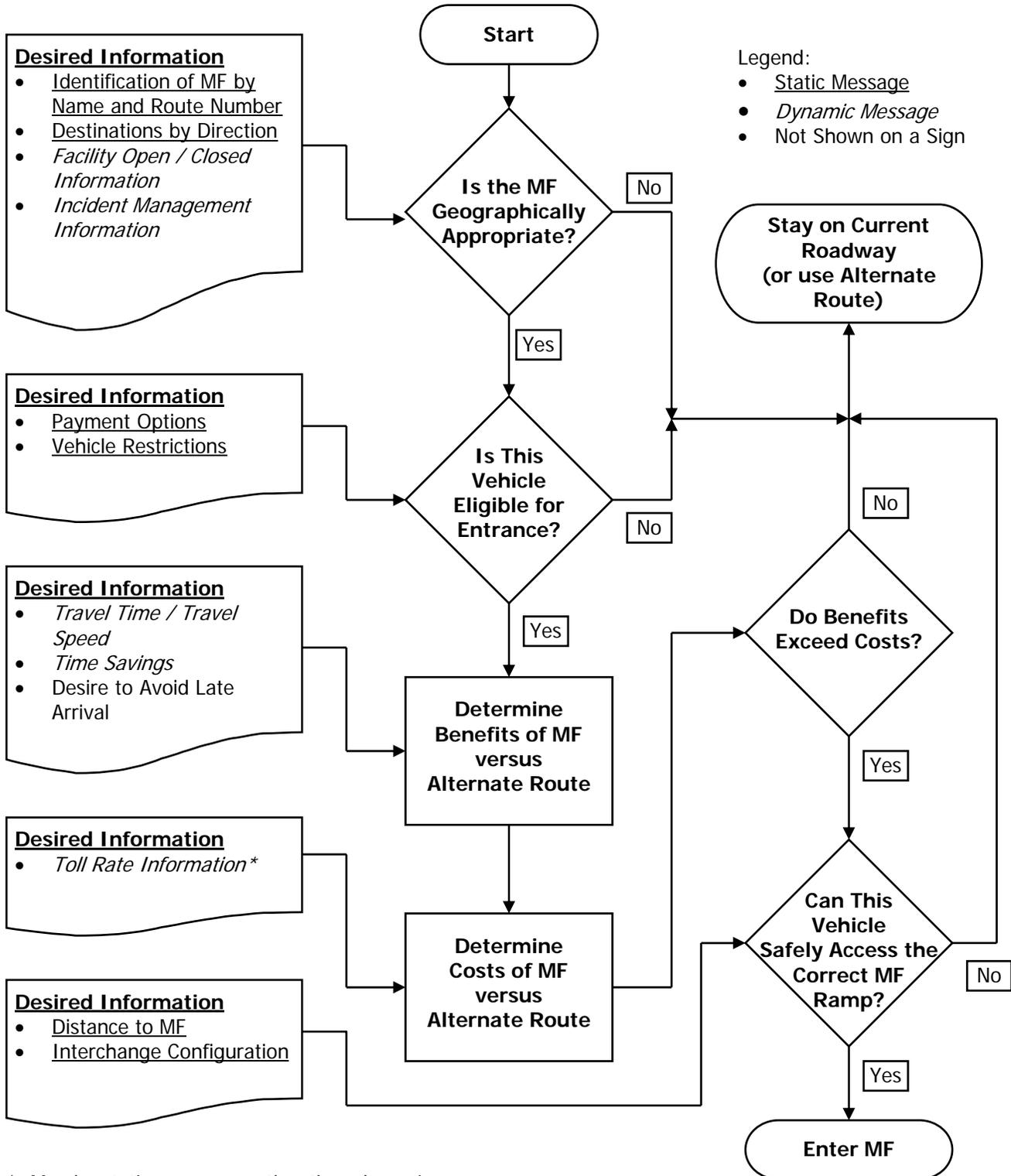
ML = Managed Lane

**Figure 2.2**  
**Project 0-4160 (Texas Transportation Institute)**  
**Conceptualized Traveler Decision Model for Managed Lanes**  
**(Modified to Depict Static Messages, Dynamic Messages,**  
**and Information Not Shown on Signs)**



\* May be static message, rather than dynamic message.  
 ML = Managed Lane

**Figure 2.3**  
**Project 0-4160 (Texas Transportation Institute)**  
**Conceptualized Traveler Decision Model for Managed Facility**  
**(Modified for Content and to Depict Static Messages,**  
**Dynamic Messages, and Information Not Shown on Signs)**



\* May be static message, rather than dynamic message.  
 MF = Managed Facility

**Table 2.1**  
**Managed Lane ETC Signing Concepts**  
**Possible Dynamic Sign Message Content on General Purpose Lanes**  
**(Shown in Italics in Figure 3)**

- Open / Closed Information
  - Managed Lane Closed
  - Managed Lane Open
- Incident Management Information
  - Problem: Describe the event or condition
  - Location: Describe where the problem is located
  - Solution: Describe the recommended motorist action, as needed.
- Travel Time or Travel Speed (should not exceed posted speed limit)
  - To next exit?
  - To end of Managed Lane?
  - To next major interchange?
  - Time Savings: Managed Lane versus General Purpose Lanes
- Toll Rate Information
  - Payment Method (not required for each direction) – should be static message
    - Automatic Vehicle Identification (AVI) / No AVI
    - Electronic Toll Collection (ETC) / No ETC
    - Video / No Video
    - Cash / No Cash
    - Tickets / No Tickets
  - Vehicle Classification (not required for each direction) – should be static message, if provided; not required unless vehicle type restriction is active
    - 2 Axles\*
    - 3 Axles\*
    - 4+ Axles\*
  - Cost Information by Vehicle Class and by Payment Method\*\*
    - Current Cost per Mile?
    - Maximum Cost per Mile?
    - Current Cost to Next Exit?
    - Maximum Cost to Next Exit?
    - Current Cost to End of Managed Lane?
    - Maximum Cost to End of Managed Lane?
    - Minimum Toll?
  - Information Telephone Number / Website
    - Maximum of 4 characters, per 2003 MUTCD

\* Assumes 3 classifications, with this breakdown. Classification system may vary by facility or agency.

\*\* May be static message, rather than dynamic message, upon opening of the Managed Lane.

Notes: 1. All information to be provided for each direction of travel on the Managed Lane except as noted.  
2. Not all of the information shown in this table can be displayed. Dynamic message signs should be limited to no more than four information units.

**Table 2.2**  
**Managed Facility ETC Signing Concepts**  
**Possible Dynamic Sign Message Content on Intersecting Roadways**  
**(Shown in Italics in Figure 4)**

- Open / Closed Information
  - Managed Facility Closed
  - Managed Facility Open (not necessary)
- Incident Management Information
  - Problem: Describe the event or condition
  - Location: Describe where the problem is located
  - Solution: Describe the recommended motorist action, as needed.
- Travel Time or Travel Speed (should not exceed posted speed limit)
  - To next exit?
  - To end of Managed Facility?
  - To next major interchange?
  - Time Savings: Not feasible to provide at this time
- Toll Rate Information
  - Payment Method (not required for each direction) – should be static message
    - Automatic Vehicle Identification (AVI) / No AVI
    - Electronic Toll Collection (ETC) / No ETC
    - Video / No Video
    - Cash / No Cash
    - Tickets / No Tickets
  - Vehicle Classification (not required for each direction) – should be static message, if provided; not required unless vehicle type restriction is active
    - 2 Axles\*
    - 3 Axles\*
    - 4+ Axles\*
  - Cost Information by Vehicle Class and by Payment Method\*\*
    - Current Cost per Mile?
    - Maximum Cost per Mile?
    - Current Cost to Next Exit?
    - Maximum Cost to Next Exit?
    - Current Cost to End of Managed Facility?
    - Maximum Cost to End of Managed Facility?
    - Minimum Toll?
  - Information Telephone Number / Website
    - Maximum of four characters, per 2003 MUTCD

\* Assumes 3 classifications, with this breakdown. Classification systems may vary by facility or agency.

\*\* May be static message, rather than dynamic message, upon opening of the Managed Facility.

Note: 1. All information to be provided for each direction of travel on the Managed Facility except as noted.  
2. Not all of the information shown in this table can be displayed. Dynamic message signs should be limited to no more than four information units.

## **PROVIDING DECISION-MAKING INFORMATION THROUGH SIGNING**

The preceding discussion, tables, and figures demonstrate that a great deal of information is desired by a motorist approaching a managed lane or managed facility, and that some combination of static signs and dynamic message signs are the most appropriate mechanism for delivering such information. The discussion also points out that there is a difference between desired information and required information.

Due to the volume of desired information, it can not be provided through roadway signing alone. For each managed lane or managed facility a decision matrix must be developed to determine which of the desired information needs is applicable to the proposed management strategies and performance goals. This information must be conveyed in a clear, consistent, and systematic manner. The specific guidelines discussed in Chapter 3 have been developed to address this challenge.

### **3. SIGNING FOR MANAGED LANES / MANAGED FACILITIES**

#### **A. NAMING / NUMBERING OF MANAGED LANES AND MANAGED FACILITIES**

##### **Background**

According to the Federal Highway Administration:

“Major interstate routes are designated by one- or two-digit numbers. Routes with odd numbers run north and south, while even numbered run east and west. For north-south routes, the lowest numbers begin in the west, while the lowest numbered east-west routes are in the south. By this method, Interstate Route 5 (I-5) runs north-south along the west coast, while I-10 lies east-west along the southern border...

...The major route numbers generally traverse urban areas on the path of the major traffic stream. Generally, this major traffic stream will be the shortest and most direct line of travel. Connecting Interstate routes and full or partial circumferential beltways around or within urban areas carry a three-digit number. These routes are designated with the number of the main route and an even-numbered prefix. Supplemental radial and spur routes, connecting with the main route at one end, also carry a three-digit number, using the number of the main route with an odd-number prefix.” (<http://www.fhwa.dot.gov/programadmin/interstate.html>)

In addition, the AASHTO Transportation Policy Book, January 2000, in the section entitled “Establishment of a Marking System of the Routes Comprising the National System of Interstate and Defense Highways” (Retained from August 10, 1973), states that:

“No new divided numbers (such as I-35W and I-35E, etc.) shall be adopted. Existing divided Interstate numbers shall be eliminated as rapidly as the State Highway Department and the Standing Committee on Highways can reach agreement with reference thereto.”

Finally, Section 2D.10 of the MUTCD states that “All numbered highway routes shall be identified by route signs and auxiliary signs.”

It is desirable to establish a policy, in conformity with the above guidance, regarding the naming and/or numbering of both managed lanes and managed facilities.

##### **Rationale for This Guideline**

As is the case with all freeways, it is important that managed lanes and managed facilities be clearly identified to motorists. Such identification can be provided either by route numbers or names.

##### **Recommendations**

Managed lanes shall carry the same name and/or number as the highway upon which those managed lanes are located. Additional text shall be provided for managed lanes, in order to clearly indicate that those lanes are not for general traffic. For example, the word EXPRESS or the words EXPRESS TOLL LANES could be used on guide signs for the managed lanes. In

some instances, an identifying “banner” or “logo” may be used, provided that the banner or logo does not provide visual information which would be likely to be distracting or confusing to motorists. Managed facilities shall be named and/or numbered in the same manner as all other highways under the agency’s jurisdiction.

### MdTA Guideline

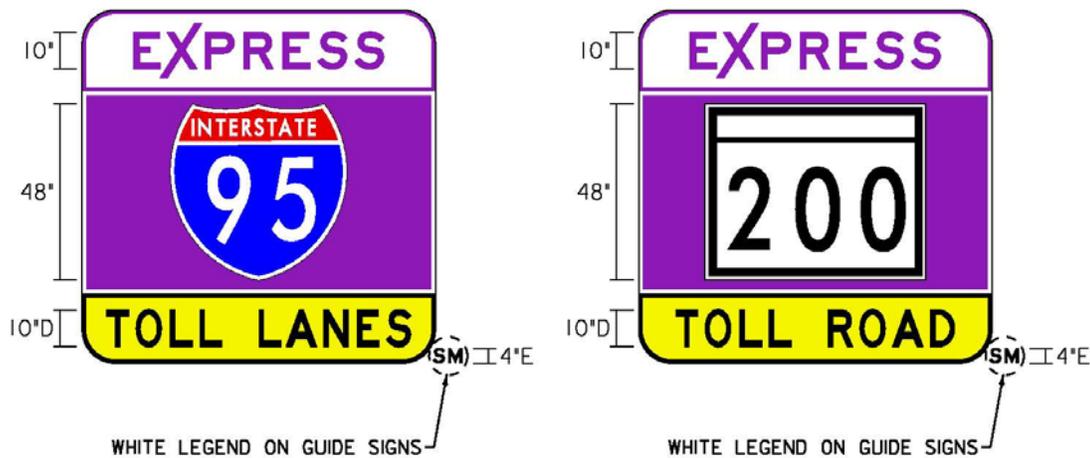
#### 2D.11 Design of Route Signs

Route signs shall be provided for managed lanes and managed facilities on Authority roadways. Managed lanes and managed facilities shall be “branded” through use of a logo. This logo shall consist of:

- A top banner, with purple text on white background, with EXPRESS in a stylized font.
- A middle section, containing a standard route marker appropriate for that facility, with the marker on a purple background.
- A bottom banner, with TOLL LANE, TOLL LANES, or TOLL ROAD in black text on a yellow background.)

See Authority Standard Nos. M1-5(2) and M1-5(3) and **Figure 3A.1** for additional details.

**Figure 3A.1**  
Route Signs



As noted previously, the Authority is currently pursuing efforts to brand and service mark the name Express Toll Lanes, the logo, and the acronym ETLs. In accordance with these efforts, the service mark shown in **Figure 3A.1** should be included whenever possible. For example, when these route signs are placed on a guide sign, the service mark should be included. The service mark is not required on route sign assemblies.

## **B. INTERCHANGE EXIT NUMBERING**

### **Background**

The 2003 Edition of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), Section 2E.28 states the following:

“Interchange numbering shall be used in signing each freeway interchange exit. The exit number shall be displayed on a separate plaque at the top of the Advance Guide or Exit Direction sign. The standard exit number plaque shall include the word EXIT, the appropriate exit number, and the suffix letter (on multi-exit interchanges). Exit numbers shall not include the cardinal initials corresponding to the directions of the cross route.”

Section 2E.28 also recommends that reference location sign exit numbering (that is, using an exit number which corresponds to the milepost of the facility) be used.

### **Rationale for This Guideline**

Exit Numbers are provided to better direct the road users towards their destination. They also help the users to better orient themselves on the freeway.

### **Recommendations**

On managed lanes/managed facilities, Interchange Exit Numbering shall be provided.

On managed lanes, the exit numbers shall be whole numbers identical to the adjacent numbers used to denote distance points on the highway upon which the managed lanes are located. Interchange Exit Numbering for managed lanes will utilize the same exit number and suffix letter used for the corresponding movement on the adjacent general purpose lanes.

In general, on managed facilities, the distance points used for exit numbers shall be identified in accordance with Section 2D.46 of the MUTCD. In instances where the managed facility is a physical continuation of another highway, the distance points on that highway may be continued onto the managed facility

### **MdTA Guideline**

#### 2E.28 Interchange Exit Numbering

Location and size of Interchange Exit Numbering on Authority roadways shall conform to the Recommendations above.

## **C. STATIC GUIDE SIGNS ON APPROACHES TO COMBINED MANAGED LANES / GENERAL PURPOSE LANES INTERCHANGES**

### **Background**

Approaches to managed *lanes* present challenges different from those encountered on approaches to managed *facilities*. Both present challenges different from those encountered on traditional roadways. On approaches to a managed *facility*, there is typically no parallel route in the immediate proximity of the managed facility for which guide signing must be provided. On approaches to managed *lanes*, however, it is often necessary to provide guide signing for both general purpose lanes and for managed lanes, where both sets of lanes share the same route name / route number. This could easily result in confusion for the motorist.

In some instances, access to the managed lanes will be from the same side of the approaching roadway as access to the general purpose lanes; in other instances, access to the managed lanes will be from the opposite side of the approaching roadway as access to the general purpose lanes. This variability only serves to increase the potential for motorist confusion.

It is desirable to establish a policy which will enable an agency to provide clear guide signing, for traffic wishing to access either general purpose lanes or managed lanes.

### **Rationale for This Guideline**

It is imperative that a motorist be clearly directed to the set of lanes of his / her choice, when approaching a combined managed lanes / general purpose lanes interchange. It is desirable that this guidance be provided in a consistent manner, for all such interchanges throughout an agency’s jurisdiction, and for all possible sets of access configurations.

### **Recommendations**

On an approach to a combined managed lanes / general purpose lanes interchange:

- Guide signing for the general purpose lanes shall be provided in accordance with the MUTCD.
- Advance Guide signs for the managed lanes shall be provided at the locations called for in Section 2E.30 of the MUTCD. These Advance Guide signs shall provide route number / route name information, and may provide destination information. If the policy of the agency is to “brand” its managed lanes, a logo may be used instead of or in addition to the route number, provided use of the logo is not expected to lead to motorist confusion. Cardinal direction information should be provided when appropriate.
- If the managed lanes are toll-managed lanes, Advance Guide signs shall provide information regarding all accepted payment types. A “no cash” or similar message may also be provided wherever conditions exist to create motorist confusion if such a message is not provided. The route number / route name shall be located on the left side of the sign; the payment type information shall be placed to the right of the route number / route name. Cardinal direction information, if needed, shall be placed immediately above the route number / route name.

- Exit Direction signs for the managed lanes shall be provided as called for in Section 2E.33 of the MUTCD, and shall repeat all of the payment type information provided on the Advance Guide signs.
- A toll information sign and a dynamic message sign shall also be provided. See TOLL INFORMATION SIGNS ON APPROACHES TO MANAGED LANES / MANAGED FACILITIES and DYNAMIC MESSAGE SIGNS ON APPROACHES TO MANAGED LANES / MANAGED FACILITIES for additional information.

## **MdTA Guideline**

### 2E.30 Advance Guide Signs

Location and size of managed lanes and managed facility guide signs on Authority roadways shall conform with Section 2E.30 of the MUTCD.

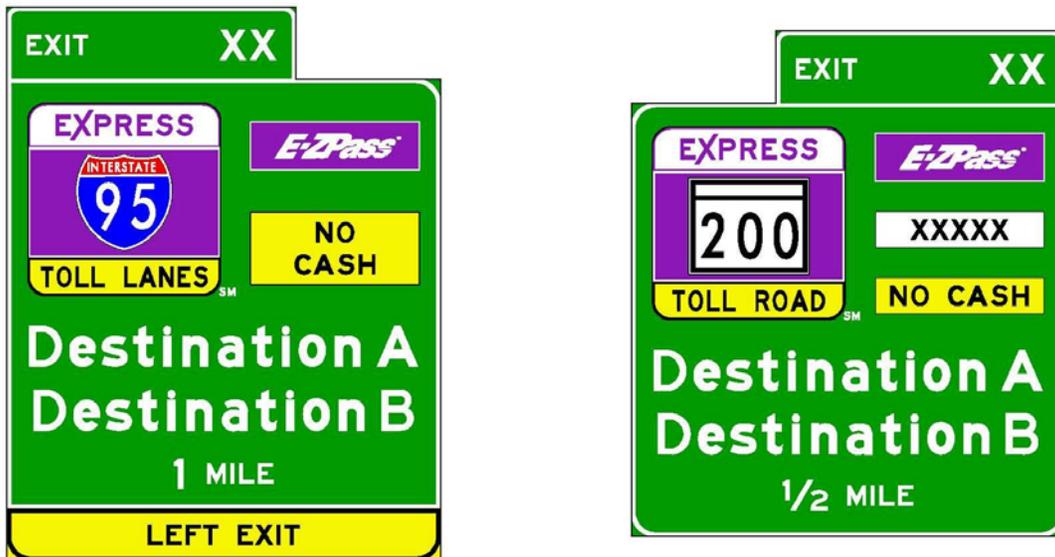
The layout of the guide signs for managed lanes and managed facilities shall be modified from the traditional roadway guide signing. A “branded” logo shall be placed on the top left side of the guide sign in place of the standard route marker. See NAMING / NUMBERING OF MANAGED LANES AND MANAGED FACILITIES for additional information.

Payment type information shall be placed on the top right side of the guide sign, in a vertical arrangement. The higher speed, higher volume payment type should be the top display. Currently, an *E-ZPass*<sup>®</sup> logo plaque would be the top display of payment type information. The message NO CASH, if used, shall be placed on a plaque which shall be the bottom display of payment type information. If another payment type is permitted, a plaque for that payment type shall be located between the *E-ZPass*<sup>®</sup> logo plaque and the NO CASH plaque, if the NO CASH plaque is used. If the NO CASH plaque is not used, then the plaque for an additional payment type shall be located beneath the *E-ZPass*<sup>®</sup> logo plaque. Each of the individual plaques indicating acceptable payment types shall be of the same size.

Samples are shown in **Figure 3C.1**.

For “Destination A” and “Destination B” refer to the following, from Section 2E.12 of the MUTCD: “The direction of a freeway and the major destinations or control cities (see Section 2D.34) along it shall be clearly identified through the use of appropriate destination legends. Successive freeway guide signs shall provide continuity in destination names and consistency with available map information. At any decision point, a given destination shall be indicated by way of only one route.”

**Figure 3C.1  
Advance Guide Signs**



**Note:** “No Cash” is not a required message. However, the team feels that during the initial years of operation, customers may benefit from the reminder.

### 2E.33 Exit Direction Signs

Location and size of managed lanes and managed facility guide signs on Authority roadways shall conform to Section 2E.33 of the MUTCD.

Guideline 2E.30 Advance Guide Signs, which is provided immediately above, shall apply to Exit Direction Signs as well.

## **D. DYNAMIC MESSAGE SIGNS ON APPROACHES TO MANAGED LANES / MANAGED FACILITIES**

### **Background**

The 2003 Edition of the Manual on Uniform Traffic Control Devices for Streets and Highways, Section 2A.07 offers this guidance with regard to Changeable Message Signs:

“Changeable message signs, both permanent and portable, may be used by State and local highway agencies to display safety or transportation-related messages. State and local highway agencies may develop and establish a policy regarding the display of safety and transportation-related messages on permanent and changeable message signs that specifies the allowable messages and applications, consistent with the provisions of this Manual.”

### **Rationale for This Guideline**

It is important to convey information regarding current operating conditions on the managed lane / managed facility to the motorist, so that he / she can make an informed decision prior to entering the managed lane / managed facility. Since “current operating conditions” vary throughout the day under non-incident conditions, and vary unpredictably under incident conditions, a dynamic message sign would be one of the most appropriate methods of providing the desired information to the motorist.

### **Recommendations**

A “branded” dynamic message sign should be provided on each approach to a managed lane / managed facility. Except under extraordinary conditions, this sign shall be used for the sole purpose of providing information regarding current operating conditions on the managed lane / managed facility; messages regarding conditions on other roadways shall not be shown on these dynamic message signs. Toll information shall generally not be shown on these signs; see TOLL RATES SIGNS ON APPROACHES TO TOLL-MANAGED LANES / TOLL-MANAGED FACILITIES for additional information.

Because this dynamic message sign should only provide information regarding current operating conditions on the managed lane / managed facility, it may be desirable to add a “banner” or some other type of identification to the dynamic message sign, specific to the managed lane / managed facility.

Except for very unusual circumstances, a single dynamic message sign shall be used to provide information regarding all possible directions of travel on the managed lane / managed facility from a single direction of approach.

## **MdTA Guideline**

### 2A.07 Dynamic Message Signs

Provisions should be made to allow for a dynamic message sign on each approach to managed lanes and managed facilities on Authority roadways. When provided, this sign should provide information regarding operating conditions on the managed lanes / managed facilities. When provided, the dynamic message sign shall be “branded” by means of a banner across the top of the sign. Initially the service mark will not be required in this application. A sample layout is shown in **Figure 3D.1**. See Authority Standard No. MdTA-07.06 for currently approved “branding” panels.

**Figure 3D.1**  
**“Branded” Dynamic Message Sign**



## **E. MESSAGE CONTENT AND PRIORITY FOR DYNAMIC MESSAGE SIGNS ON APPROACHES TO MANAGED LANES / MANAGED FACILITIES**

### **Background**

Managed lanes / managed facilities present special challenges in providing motorist information. Particularly when the management of the lanes / facility is by means of a toll, it is desirable to provide information regarding current operating conditions on the managed lanes / managed facility. See DYNAMIC MESSAGE SIGNS ON APPROACHES TO MANAGED LANES / MANAGED FACILITIES for additional information.

Because of the dedicated purpose of these particular dynamic message signs, it is desirable to establish a policy regarding the types of safety or transportation-related messages which are permitted on these signs, and the priority order for those messages.

### **Rationale for This Guideline**

In order to provide a consistent and reliable source of information to the motorist, it is important to establish a consistent content and priority order for messages to be used on dynamic message signs on approaches to managed lanes / managed facilities.

### **Recommendations**

The priority order for messages on dedicated dynamic message signs located on approaches to managed lanes / managed facilities shall be as follows:

- Incident Information on the Managed Lane / Managed Facility
- “Normal” Operating Condition Information
- Toll Information
- Additional information about the content of these types of messages is provided below.

#### Incident Information on the Managed Lane / Managed Facility

In the event of an incident substantially affecting traffic flow on the managed lane / managed facility, appropriate information regarding the incident shall have the highest priority. This type of information may be very specific (such as “Eastbound Route A Closed Past Exit B”) or more general (such as “Westbound Route A Delays Past Exit C”), depending upon the nature of the incident and the extent of the available data. The precise text to be used shall be established in accordance with the MUTCD priority listing: “If the message can be displayed in one phase, the top line should present the problem, the center line should present the location or distance ahead, and the bottom line should present the recommended driver action.”

### “Normal” Operating Condition Information

If there is no incident or unusual condition on the managed lane / managed facility, “normal” operating conditions information may be provided. This type of information may consist of specific data, such as travel times or travel speeds. It may also consist of more general information such as “Congestion Eastbound between Exit D and Exit E” or “Peak Period Conditions.” The precise text to be used shall be determined by State and local highway agencies.

It may also be desirable to provide no information at all when conditions are “normal,” thus leaving the dynamic message sign dark.

### Toll Information

If the managed lanes / managed facilities in question are managed by means of tolls, toll information may also be displayed. This type of information shall be displayed only when there are no incidents substantially affecting traffic flow on the managed lane / managed facility, and only when no specific data regarding “normal” operating conditions is available and determined to be meaningful.

Such toll information may simply repeat information shown on the Toll Information Sign. (See TOLL INFORMATION SIGNS ON APPROACHES TO TOLL-MANAGED LANES / TOLL-MANAGED FACILITIES for additional information.) If different information is to be displayed on the dynamic message sign and the Toll Information Sign, care shall be taken to coordinate the messages in order to minimize the potential for motorist confusion.

## **MdTA Guideline**

### 2A.07 Dynamic Message Signs

Managed lanes and managed facilities on Authority roadways shall conform with the Recommendations above.

## **F. TOLL RATES SIGNS ON APPROACHES TO MANAGED LANES / MANAGED FACILITIES**

### **Background**

The 2003 Edition of the Manual on Uniform Traffic Control Devices for Streets and Highways provides no explicit guidance regarding provision of toll information to motorists. Ideally, all motorists approaching the last exit prior to a toll barrier at which a toll must be paid would be notified of that condition, with specific reference to the amount of the toll when possible. Ideally, similar information would be provided on entrance ramps to a toll facility where there is no exit between the entrance ramp and the toll barrier. While experience in the United States with toll-managed lanes and toll-managed facilities is limited, those few facilities in existence generally provide toll information to the motorist prior to entering.

It is desirable to establish a policy for toll information with specific regard to approaches to both toll-managed lanes and toll-managed facilities. (The Federal Highway Administration is planning to address this topic in the next edition of the MUTCD.)

### **Rationale for This Guideline**

The cost to the motorist for use of a toll-managed lane or facility will vary with the congestion level on that managed lane / managed facility. The toll rates may be “semi-static”; that is, they may vary by time-of-day, based upon historically observed congestion levels. Toll rates may also be “dynamic,” changing in response to observed congestion levels.

Regardless of the manner in which the toll rates are varied, it is essential to provide the motorist with current toll information in order to use tolls to manage congestion levels on a managed lane / managed facility.

### **Recommendations**

A toll rates sign shall be provided on each approach to a toll-managed lane / toll-managed facility. This sign shall be used for the sole purpose of providing information regarding tolls on the toll-managed lane / toll-managed facility. If the tolls on the toll-managed lane / toll-managed facility are “semi-static,” either a conventional sign (that is, a sign with a fixed message), or a conventional sign with dynamic message inserts, may be used. In the case of dynamic tolling, a conventional sign with dynamic message inserts may be used.

Except for very unusual circumstances, a single toll rates sign shall be used to provide information regarding all possible directions of travel on the toll-managed lane / toll-managed facility from a single direction of approach. At all intermediate interchanges (that is, at all interchanges except for the endpoints of the toll-managed lane / toll-managed facility), the toll rate shown for a particular direction of travel shall be for the furthest destination on the toll-managed lane / toll-managed facility from that intermediate interchanges.

At the endpoints of a toll-managed lane / toll-managed facility, multiple destinations may be shown on a toll rates sign. One of these destinations shall be the furthest destination on the toll-managed lane / toll-managed facility; the other destination shall be an intermediate interchange.

The particular intermediate interchange to be used shall be determined on a case-by-case basis, depending upon local factors including the relative importance of the intermediate interchanges.

If multiple options for payment of the toll are available to a motorist, and if the toll varies on the basis of the payment option used by the motorist, only one toll rate shall be displayed for a particular destination. The toll rate displayed shall be for the payment option expected to be used by the greatest number of motorists. An additional panel may be added to the toll rates sign to inform motorists regarding which payment option is reflected by the display, and to inform motorists that the toll rate may be different for other payment options.

If the toll varies on the basis of vehicle classification, only one toll rate shall be displayed for a particular destination. The toll rate displayed shall be for the vehicle classification expected to be most common on the toll-managed lane / toll-managed facility. An additional panel may be added to the toll rates sign to inform motorists regarding which vehicle classification is reflected by the display, and to inform motorists that the toll rate may be different for other classifications.

Because this toll rates sign should only provide information regarding the managed lane / managed facility, it may be desirable to add a “banner” or some other type of identification to the toll rates sign, specific to the managed lane / managed facility.

## **MdTA Guideline**

### Managed Lane Facility Toll Rate Signs and Managed Facility Toll Rate Signs

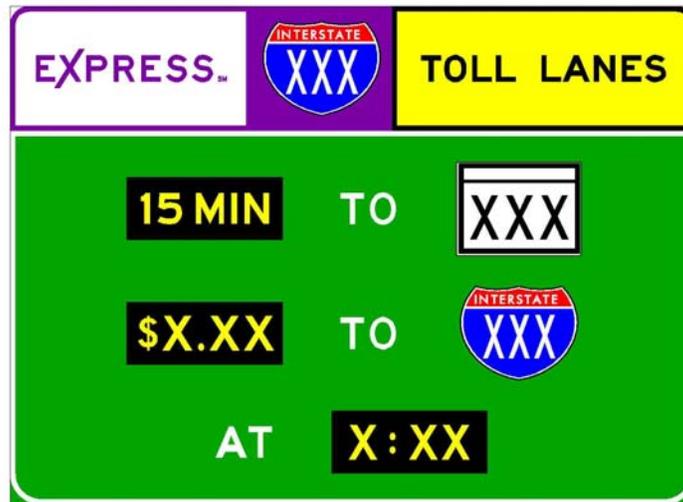
A Managed Lane Facility Toll Rate Sign or Managed Facility Toll Rate Sign shall be provided on each approach to managed lanes and managed facilities on Authority roadways. The Managed Lane Facility Toll Rate Signs and Managed Facility Toll Rate Signs shall be “branded” by means of a banner across the top of the sign.

The Managed Lane Facility Toll Rate Signs and Managed Facility Toll Rate Signs shall be in conformance with the Recommendations above.

A sample layout for the Managed Lane Facility Toll Rate Signs and Managed Facility Toll Rate Signs is shown in **Figure 3F.1**. The user is cautioned that this Figure is subject to change, depending upon the business plan adopted for operating specific toll-managed lanes / toll-managed facilities. The user should routinely check with the Authority to be sure that he / she has the latest version.

See Authority Standard No. MdTA-07.04, Authority Standard No. MdTA-07.04(1), and **Figure 3F.1** for additional details.

**Figure 3F.1**  
**Managed Lane Facility Toll Rate Sign**



## **G. TRAVEL / TOLL INFORMATION SIGNS ON APPROACHES TO MANAGED LANES/MANAGED FACILITIES**

### **Background**

Toll-managed lanes / toll-managed facilities are still a new concept to the motoring public. It is desirable to provide information about acceptable payment methods, registration, violation, or other toll information to motorists as they approach a toll-managed lane / toll-managed facility, before they are committed to using the toll-managed lane / toll-managed facility. The information to be provided is likely to be too extensive and variable to be shown on static highway signs.

It is desirable to establish a policy which will guide an agency in providing the information by some other means, such as Highway Advisory Radio (HAR) and/or telephone, and to inform the motorist of the availability of the additional information.

### **Rationale for This Guideline**

It is important that a motorist have the opportunity to obtain information about the unusual nature of a toll-managed lane / toll-managed facility before entering the facility. It is desirable that a consistent method be used to inform the motorist that this information is available.

### **Recommendations**

An information sign shall be provided on each approach to a toll-managed lane / toll-managed facility. Approaches determined to be “Major” shall have a sign which shall include flashing yellow warning beacons. Approaches determined to be “Minor” shall have a sign which does not include flashing yellow warning beacons.

### **MdTA Guideline**

#### Travel/Toll Information Signs

A Travel/Toll Information sign shall be provided on each approach to toll-managed lanes and toll-managed facilities on Authority roadways. This sign shall be located in advance of all other guide signing related to the toll-managed lane /toll-managed facility. The Travel/Toll Information Sign for Major Road Approach to Managed Lane/Facility (shown in **Figure 3G.1**) shall be used on Major Roadways. The Travel/Toll Information Sign for Minor Road Approach to Managed Lane/Facility (shown in **Figure 3G.2**) shall be used on Minor Roadways.

A roadway shall be defined as “Major” if it meets one or more of the following three criteria:

- full control of access
- posted speed limit of greater than 50 mph
- forecasted AADT five years after the opening of the managed lane/managed facility of greater than 50,000.

All other interchanging roadways shall be classified as Minor Roadways.

See Authority Standard Nos. MdTA-07.02 and MdTA-07.03 and **Figures 3G.1** and **3G.2** for additional details.

**Figure 3G.1**  
Travel / Toll Information Sign – Major Road Approach – Managed Lane / Facility



**Figure 3G.2**  
Travel / Toll Information Sign – Minor Road Approach – Managed Lane / Facility



## **H. MANAGED LANES / MANAGED FACILITIES SIGNING FOR NON-INTERCHANGING ROADWAYS**

### **Background**

The Maryland Transportation Authority (MdTA) classifies each roadway, which interchanges with a toll-managed lane / toll-managed facility as either a “major roadway” or a “minor roadway.” For the purposes of this document, an interchanging roadway is defined to be a roadway which is grade-separated from the toll-managed lane / toll-managed facility and has one or more ramp connections to the toll-managed lane/ toll-managed facility. Further, an interchanging roadway shall be defined as “major” if it meets one or more of the following three criteria:

- full control of access. (Access to fully controlled facilities, including freeways and expressways, is limited to grade-separated interchanges.)
- posted speed limit of greater than 50 mph.
- forecasted AADT five years after the opening of the managed lane / facility of greater than 50,000.

All other interchanging roadways shall be classified as “minor” roadways.

In addition to traditional guide signing, each interchanging roadway should have the following sequence of signs on the approach to the toll-managed lane toll-managed facility:

- MdTA - 07.02 Travel / Toll Info Sign Major Road Approach Managed Lane / Facility or MdTA - 07.03 Travel / Toll Info Sign Minor Road Approach Managed Lane / Facility
- “Branded” Dynamic Message Sign
- MdTA - 07.04 Toll Rates Sign (ORT Facility)

Each Toll Rates Sign (ORT Facility) is identical, regardless of application. The size of the “Branded” Dynamic Message Signs may vary, depending upon the particular application. There are two Travel / Toll Information Signs; each is designed and sized based on the location of the application.

Because of sign spacing requirements, this sequence of additional signs may begin one to two miles from the toll-managed lane / toll-managed facility interchange. There will be roadways that do not directly interchange with the toll-managed lane / toll-managed facility, but do intersect with the interchanging roadway within the limits of the sequence of additional signs. For the purposes of this document, these additional roadways are defined as non-interchanging roadways.

It is desirable to establish a general policy which will provide guidance on the use of additional signing along non-interchanging roadways, that intersect with the interchanging roadways.

## **Rationale for This Guideline**

It is possible that motorists on non-interchanging roadways, who intend to use the toll-managed lane / toll-managed facility, may not see some of the additional signs. Motorists should be given the opportunity to obtain as much information as practical, regarding conditions on and use of a toll-managed lane / toll-managed facility, before entering. It is also desirable that a consistent method be used to provide the motorist with this information.

## **Recommendations**

It may not be practical to provide the additional signs in such a way that is visible to all motorists on non-interchanging roadways. It is recommended that each non-interchanging roadway be classified in accordance with the following criteria:

- Non-interchanging roadways, which intersect with a major interchanging roadway within the sequence of additional signs, shall be classified as major roadways or minor roadways in accordance with the criteria used to classify interchanging roadways.
- Non-interchanging roadways which intersect with a minor interchanging roadway within the sequence of additional signs shall be classified as minor roadways, regardless of any other factors.

If a major non-interchanging roadway intersects a major interchanging roadway between the Toll Rates Sign (ORT Facility) and the entrance to the toll-managed lane / toll-managed facility, an additional Toll Rates Sign (ORT Facility) on that major non-interchanging roadway may be provided.

If a minor non-interchanging roadway intersects a major interchanging roadway between the Toll Rates Sign (ORT Facility) and the entrance to the toll-managed lane / toll-managed facility, an additional Travel / Toll Info Sign Minor Road Approach Managed Lane / Facility on that minor non-interchanging roadway may be provided.

If a minor non-interchanging roadway intersects a minor interchanging roadway between the Toll Rates Sign (ORT Facility) and the entrance to the toll-managed lane / toll-managed facility, no additional signs on that minor non-interchanging roadway will be provided.

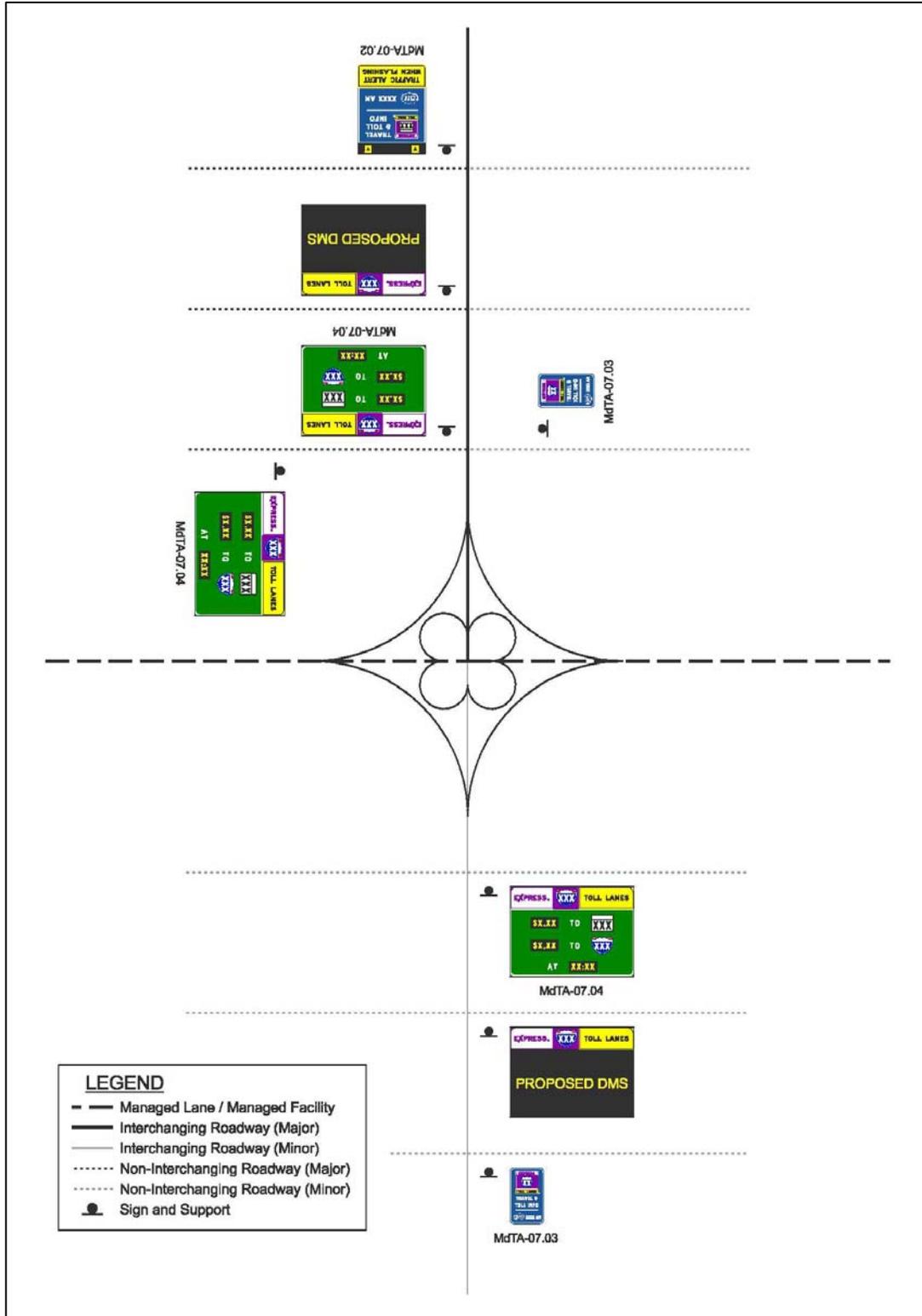
While these recommendations are generally applicable, it is important to recognize that each interchange is unique and may require special consideration.

## **MdTA Guideline**

Non-interchanging roadways shall be classified as major or minor roadways in accordance with the criteria in the Recommendations above. An additional Toll Rates Sign (ORT Facility) may be placed on each major non-interchanging roadway, which intersects a major interchanging roadway between the Toll Rates Sign (ORT Facility) and the entrance to the toll-managed lane / toll-managed facility. An additional Travel / Toll Info Sign Minor Road Approach Managed Lane / Facility may be placed on each minor non-interchanging roadway, which intersects a major interchanging roadway between the Toll Rates Sign (ORT Facility) and the entrance to the toll-managed lane / toll-managed facility. This Guideline is illustrated in **Figure 3H.1**. No

additional signs shall be provided on a minor non-interchanging roadway which intersects with a minor interchanging roadway.

**Figure 3H.1**  
**Signing for Non-Interchanging Roadways**



## **I. POST-INTERCHANGE SIGNS ON MANAGED LANES / MANAGED FACILITIES**

### **Background**

The 2003 Edition of the Manual on Uniform Traffic Control Devices for Streets and Highways, Section 2E.35, suggests that a Route sign assembly, Speed Limit sign, and Distance sign be provided (in that order) downstream of an interchange, where appropriate.

Because of the unusual nature of managed lanes / managed facilities, it may be desirable to routinely provide other information to motorists, once they are on the managed lanes / managed facilities. It is desirable to establish a policy with regard to the information to be provided.

### **Rationale for This Guideline**

In addition to the information traditionally provided on post-interchange signs, it is desirable to provide the following information to each user of a managed lane / managed facility, listed in descending order of desirability:

- Source(s) of additional information. (In accordance with Section 2A.06 of the MUTCD, if a phone number is to be provided, it should not be more than four characters in length.)
- Steps which can be taken by an unauthorized user to become an authorized user, thereby avoiding the penalties mentioned below

### **Recommendations**

Post-interchange signs on managed lanes / managed facilities, at a minimum, shall consist of a Route sign assembly, a Speed Limit sign and at least one Managed Lane / Managed Facility Post-interchange sign, in that order. A distance sign may also be provided downstream of the Managed Lane / Managed Facility Post-interchange signs, if space permits.

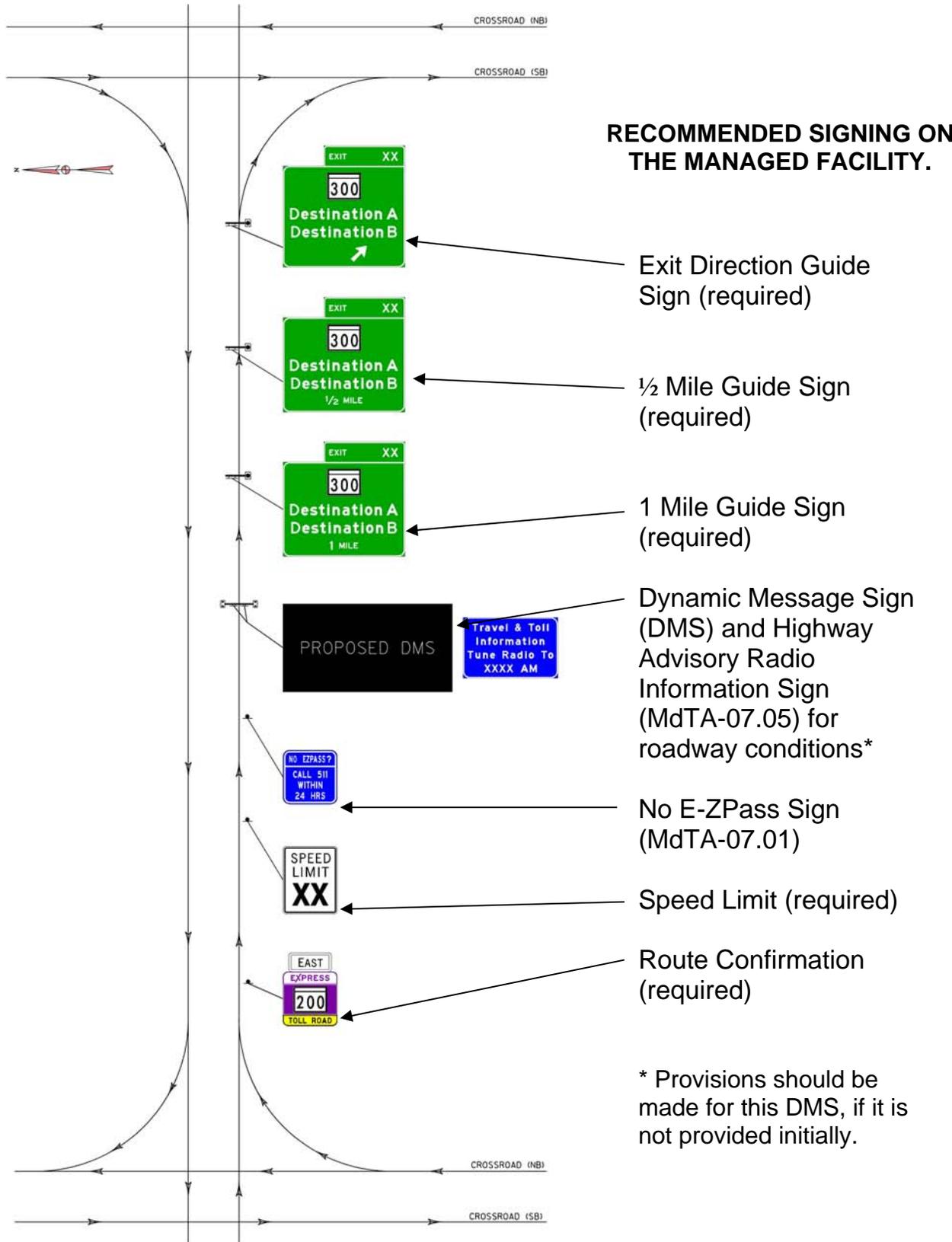
The primary intent of the Managed Lane / Managed Facility Post-interchange sign is to provide a motorist who is not authorized to use the managed lanes / managed facility with a point of contact for additional information or required action for payment of tolls.

### **MdTA Guideline**

#### 2E.35 Post-Interchange Signs

Managed lanes and managed facilities on Authority roadways shall conform with the Recommendations above. One potential layout is shown in **Figure 3I.1**.

**Figure 3I.1  
Post-Interchange Signs**



## **J. REFERENCE LOCATION SIGNS AND INTERMEDIATE REFERENCE LOCATION SIGNS ON MANAGED LANES / MANAGED FACILITIES**

### **Background**

The 2003 Edition of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), Section 2D.46 allows for the use of Reference Location Signs and Intermediate Reference Location Signs on roadways, including freeways and expressways. Section 2E.54 of that document also allows for the use of Enhanced Reference Location Signs and Intermediate Enhanced Reference Location Signs.

It is desirable to establish a policy which will enable an agency to provide these types of signs in a consistent manner on each of its roadways.

### **Rationale for This Guideline**

These signs assist road users in estimating their progress, provide a means for identifying the location of emergency incidents and traffic crashes, and aid in highway maintenance and servicing.

### **Recommendations**

On managed lanes / managed facilities, Enhanced Reference Location Signs and Intermediate Reference Location Signs shall be provided.

On managed lanes, the numbers used to denote distance points on the Enhanced Reference Location Signs and Intermediate Enhanced Reference Location Signs shall be identical to the numbers used to denote distance points on the highway upon which the managed lanes are located. In general, on managed facilities, the distance points shall be identified in accordance with Section 2D.46 of the MUTCD. In instances where the managed facility is a physical continuation of another highway, the distance points on that highway may be continued onto the managed facility.

### **MdTA Guideline**

#### 2E.54 Reference Location Signs and Enhanced Reference Location Signs

Location and size of Enhanced Reference Location Signs and Intermediate Reference Location Signs shall conform to Section 2E.54 and Section 2D.46 of the MUTCD, respectively. Intermediate Reference Location Signs shall be provided at an interval of 0.1 miles, except in locations where there is not sufficient room to safely install and maintain the signs.

Samples are shown in **Figures 3J.1** and **3J.2**.

**Figure 3J.1**  
**Enhanced Reference Location Sign**



D10-5  
Optional

**Figure 3J.2**  
**Intermediate Reference Location Sign**



D10-1A

## **K. RAMP MILE MARKER**

### **Background**

The Manual on Uniform Traffic Control Devices (MUTCD) does not provide guidance for use of Ramp Reference Location Signs or Ramp Mile Markers (RMM). As the name suggests, RMMs are placed along a ramp that connects two routes. For the purposes of this document, an RMM is defined to be the same as a Reference Location Sign or Intermediate Reference Location Sign, with the exception that the RMM would be located on a ramp, rather than on a highway.

### **Rationale for This Guideline**

RMMs could provide more accurate incident location information expediting emergency response efforts and facilitating later crash analysis. RMMs could also improve maintenance management and tracking.

### **Recommendations**

Several states have implemented RMMs but there is little consistency between the efforts and there is no national consensus as to approach. Several agencies, including the Federal Highway Administration and the I-95 Corridor Coalition, are currently conducting research on this topic for the purpose of identifying and recommending a standard sign detail and method of placement.

It is recommended that due to pending standards development, no action be taken with regard to permanent RMMs at this time.

### **MdTA Guideline**

Permanent RMMs shall not be implemented until national guidelines are available with a standard sign detail and method of placement.

Temporary RMMs may be implemented, based on need for improved location reference, at certain locations. These locations may include longer ramps (greater than 1 mile) with higher speeds (direct connection ramps with posted speeds of 50 mph or more).

## **L. SIGN DESIGN DETAILS**

### **MdTA Guideline**

#### 2E.13 Size and Style of Letters and Signs

Signs on managed lanes and managed facilities on Authority roadways shall generally conform with Section 2E.13 of the MUTCD.

The logo sign discussed in NAMING / NUMBERING OF MANAGED LANES AND MANAGED FACILITIES shall conform with Authority Standard Nos. M1-5(2) and M1-5(3).

The payment type information plaques discussed in STATIC GUIDE SIGNS ON APPROACHES TO COMBINED MANAGED LANES / GENERAL PURPOSE LANES INTERCHANGES shall conform with the following:

- *E-ZPass*<sup>®</sup> plaques shall consist of white text on an “*E-ZPass*<sup>®</sup> purple” background.
- NO CASH plaques, where used, shall consist of black text on a yellow background.
- Text which is not contained in a logo (that is, text such as NO CASH), shall be sized in accordance with the “Alternate, Letters” line of Table 2E-1 of the MUTCD.

The banner discussed in DYNAMIC MESSAGE SIGNS ON APPROACHES TO MANAGED LANES / MANAGED FACILITIES and TOLL INFORMATION SIGNS ON APPROACHES TO TOLL-MANAGED LANES / TOLL-MANAGED FACILITIES shall contain information identical to that contained on the logo sign shown in Authority Standard Nos. M1-5(2) and M1-5(3). The information shall be shown “top to bottom” on the logo sign; it shall be shown “left to right” on each banner. The information on the banner shall be proportionally sized such that the banner is the same horizontal size as the dynamic message sign or toll rate information sign.

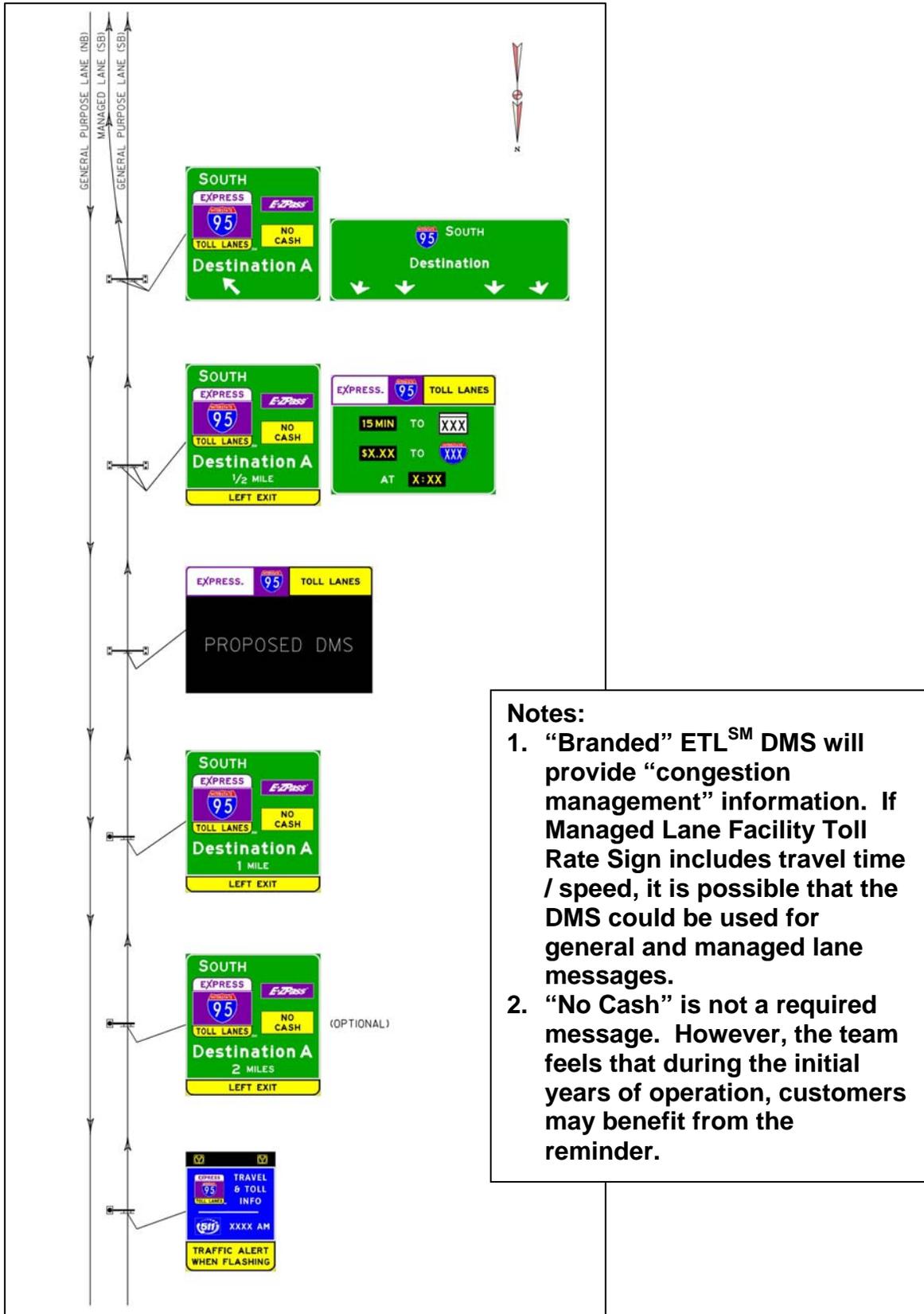
## **M. TYPICAL SIGN LAYOUTS**

The Authority has developed a number of typical sign layouts, depicting the information discussed above. The current versions of these layouts are shown in **Figures 3M.1** through **3M.5**.

For “Destination,” “Destination A,” “Destination B,” “Destination C,” and “Destination D” refer to the following, from Section 2E.12 of the MUTCD: “The direction of a freeway and the major destinations or control cities (see Section 2D.34) along it shall be clearly identified through the use of appropriate destination legends. Successive freeway guide signs shall provide continuity in destination names and consistency with available map information. At any decision point, a given destination shall be indicated by way of only one route.”

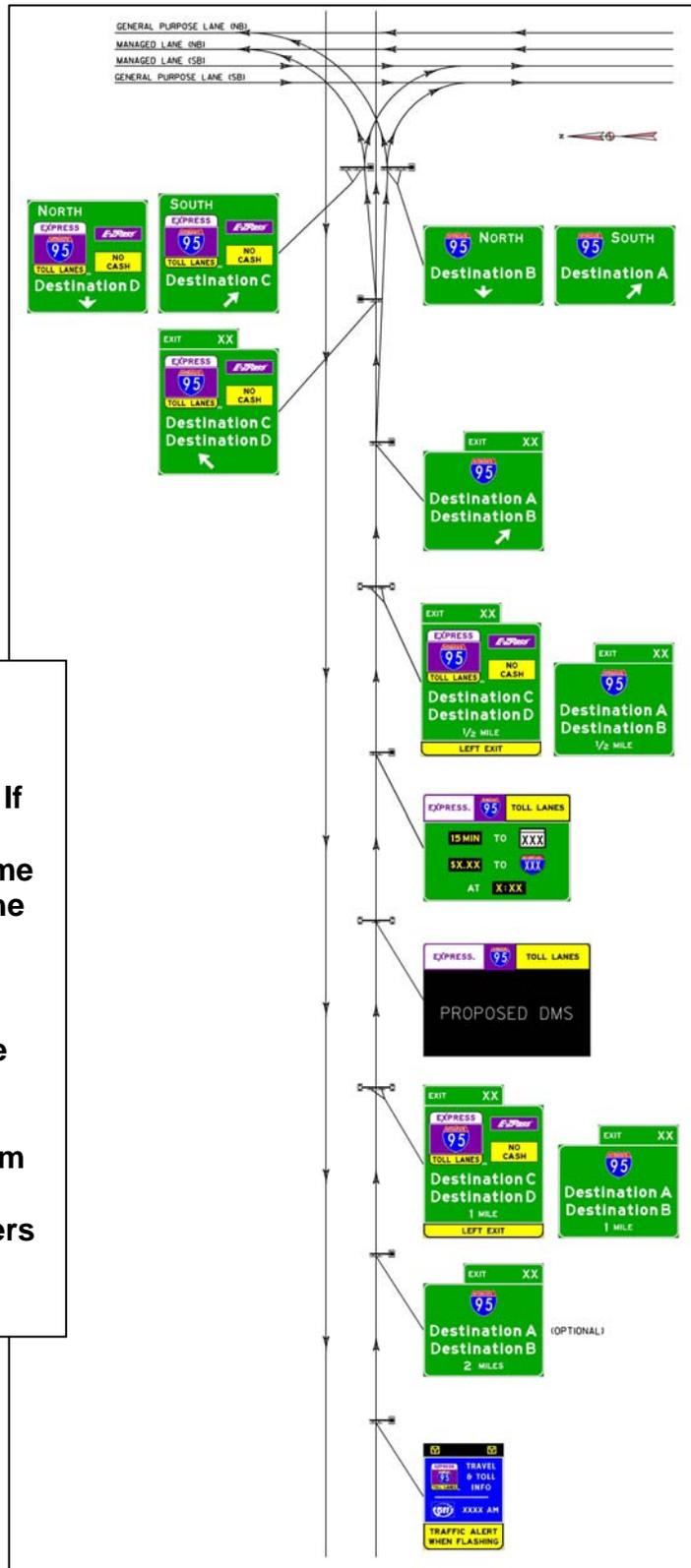
The user is cautioned that this document, and particularly these layouts, are subject to change. The user should routinely check with the Authority to be sure that he / she has the latest version.

**Figure 3M.1**  
**Formation of Managed Lane System on Freeway**



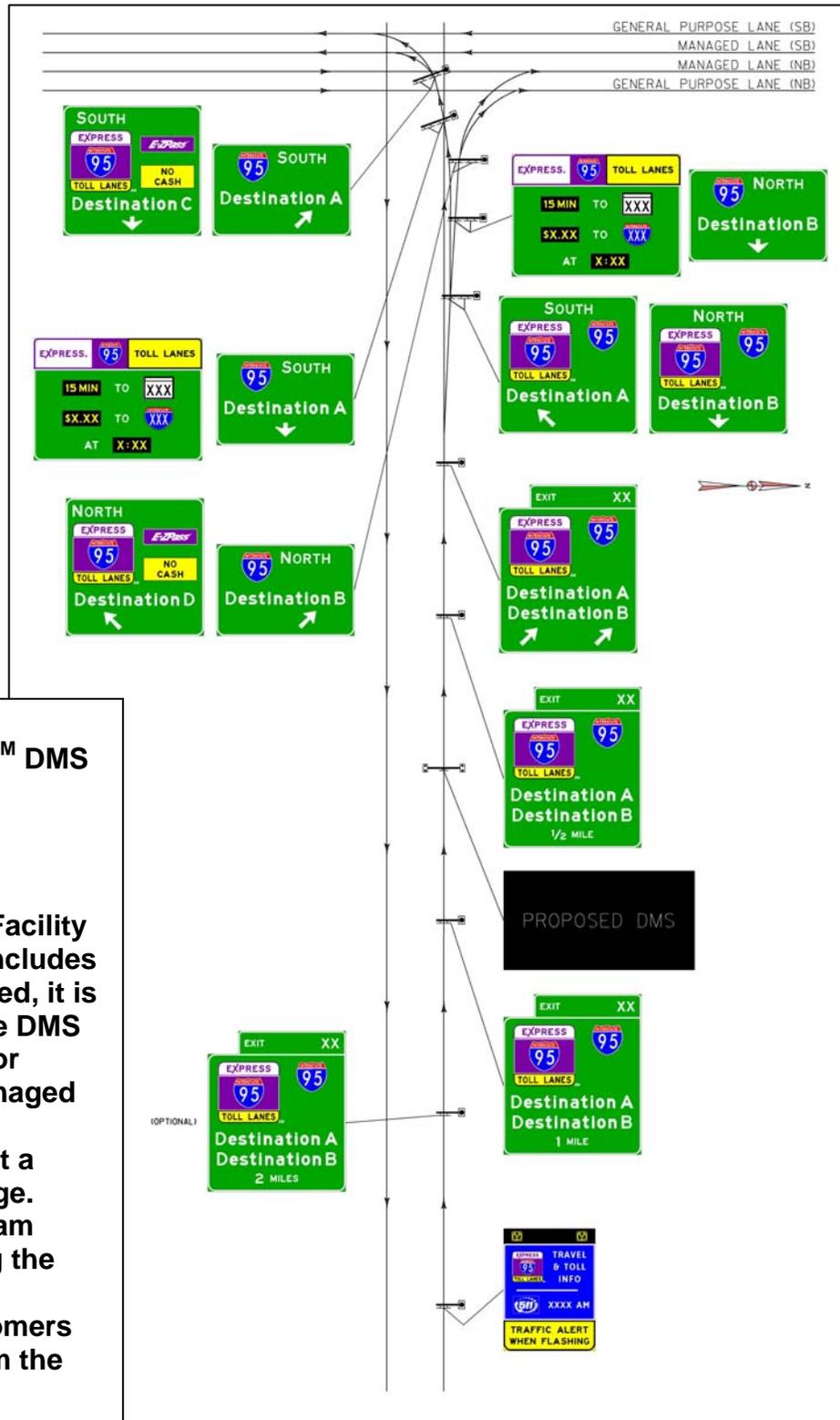
- Notes:**
1. "Branded" ETL<sup>SM</sup> DMS will provide "congestion management" information. If Managed Lane Facility Toll Rate Sign includes travel time / speed, it is possible that the DMS could be used for general and managed lane messages.
  2. "No Cash" is not a required message. However, the team feels that during the initial years of operation, customers may benefit from the reminder.

**Figure 3M.2**  
**Freeway Entrance to Managed Lane System with Ramps Exiting to the Managed and General Purpose Lanes, then Separating again by Direction of Travel**



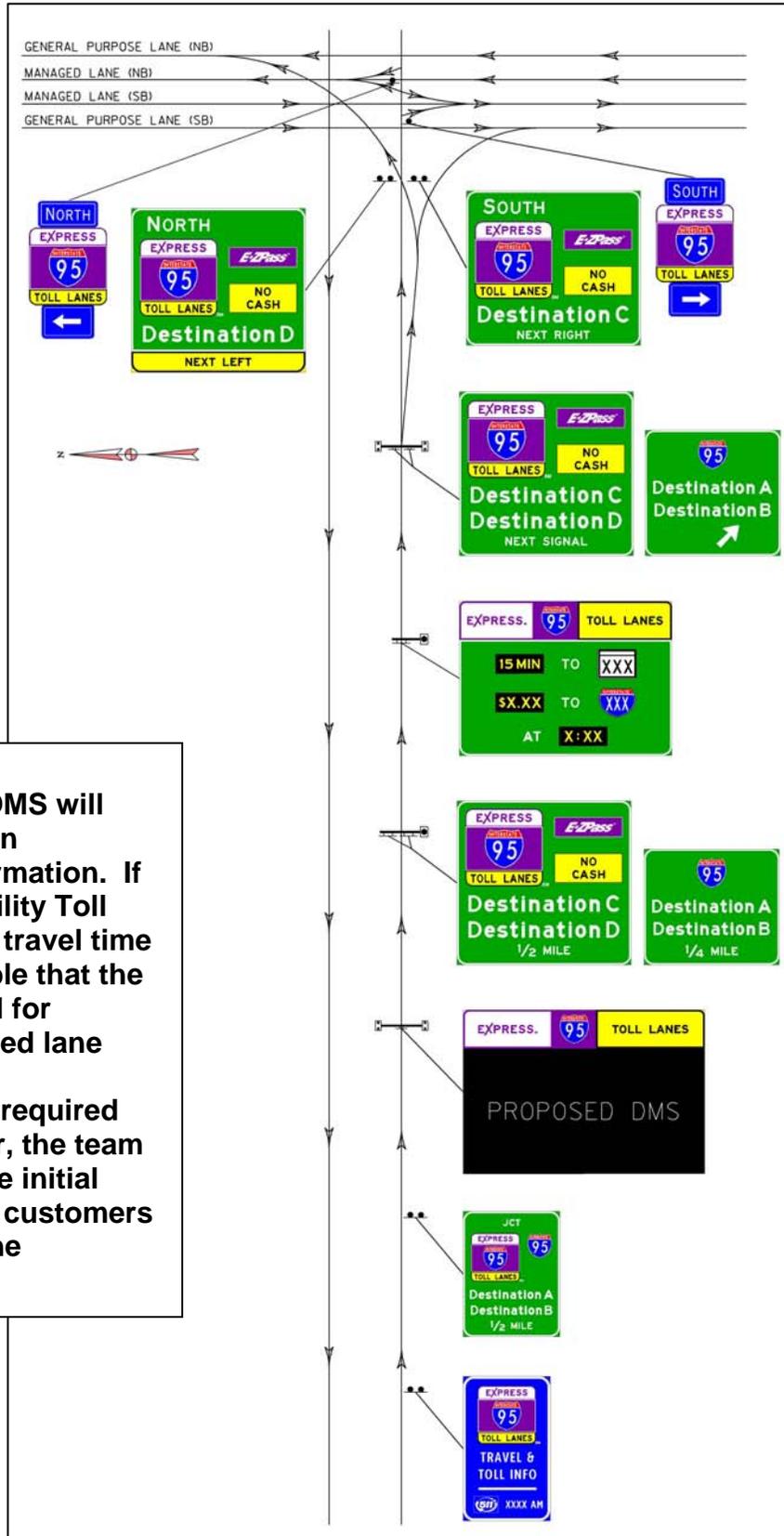
- Notes:**
1. "Branded" ETL<sup>SM</sup> DMS will provide "congestion management" information. If Managed Lane Facility Toll Rate Sign includes travel time / speed, it is possible that the DMS could be used for general and managed lane messages.
  2. Not all general purpose lane signs are shown.
  3. "No Cash" is not a required message. However, the team feels that during the initial years of operation, customers may benefit from the reminder.

**Figure 3M.3**  
**Freeway Entrance to Managed Lane System with Ramps Exiting from the Approach Street by Direction of Travel, then Separating into Managed and General Purpose Lanes**



- Notes:**
1. "Branded" ETL<sup>SM</sup> DMS will provide "congestion management" information. If Managed Lane Facility Toll Rate Sign includes travel time / speed, it is possible that the DMS could be used for general and managed lane messages.
  2. "No Cash" is not a required message. However, the team feels that during the initial years of operation, customers may benefit from the reminder.

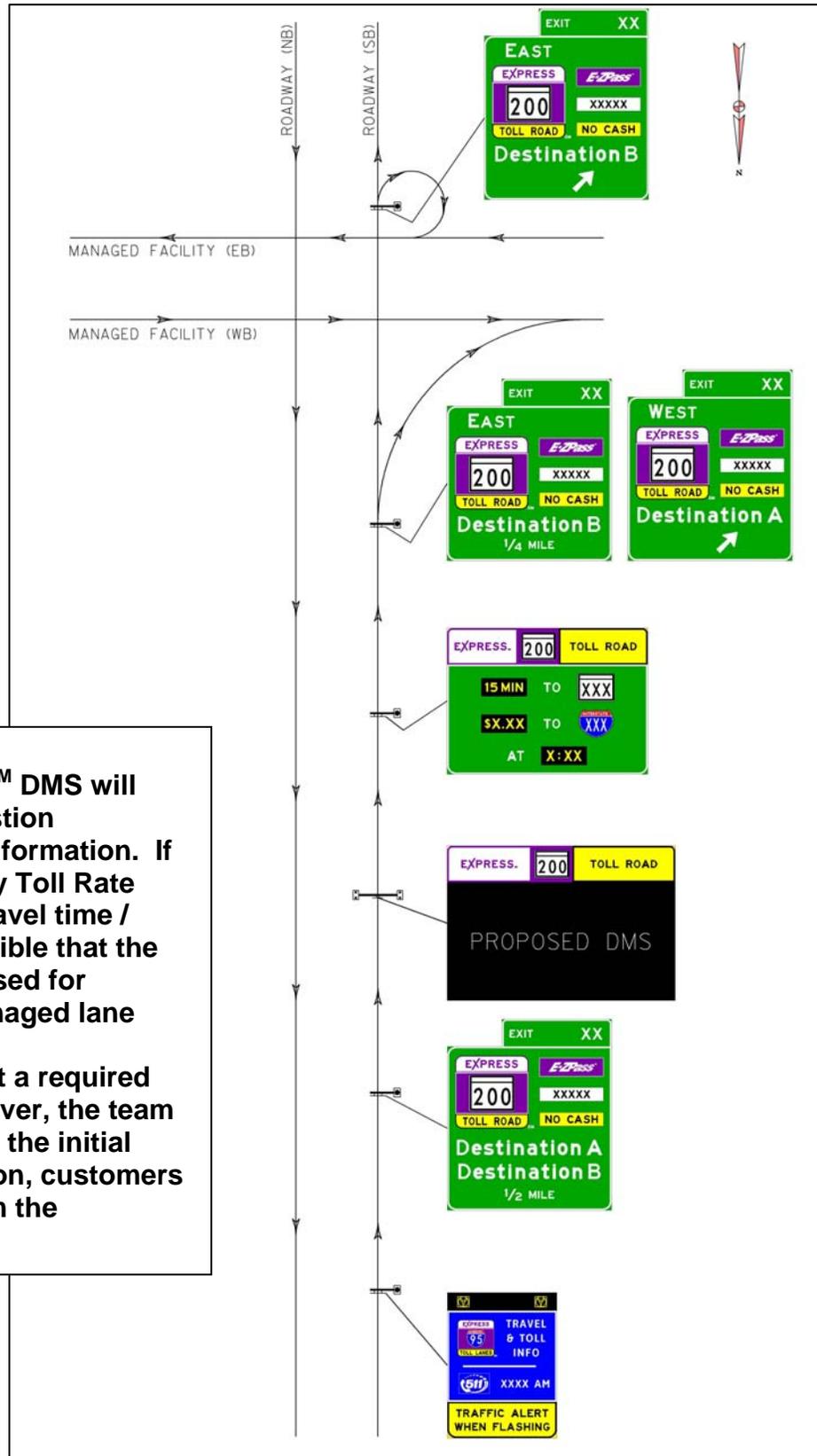
**Figure 3M.4**  
**Arterial Entrance to a Managed Lane System: Minor Roadway**



**Notes:**

1. "Branded" ETL<sup>SM</sup> DMS will provide "congestion management" information. If Managed Lane Facility Toll Rate Sign includes travel time / speed, it is possible that the DMS could be used for general and managed lane messages.
2. "No Cash" is not a required message. However, the team feels that during the initial years of operation, customers may benefit from the reminder.

**Figure 3M.5**  
**Managed Facility Entrance: Minor Roadway**



**Notes:**

1. "Branded" ETL<sup>SM</sup> DMS will provide "congestion management" information. If Managed Facility Toll Rate Sign includes travel time / speed, it is possible that the DMS could be used for general and managed lane messages.
2. "No Cash" is not a required message. However, the team feels that during the initial years of operation, customers may benefit from the reminder.

## **APPENDIX**

### **DISCUSSION OF OTHER OPTIONS CONSIDERED IN THE PREPARATION OF THIS GUIDANCE DOCUMENT**

#### **INTRODUCTION**

During the preparation of this document, a number of options were considered and discussed by a committee consisting of traffic engineers and operations representatives of the Authority, the Maryland State Highway Administration, and a number of consultants. The purpose of this Appendix is to document some of the options considered and the reasons for their non-selection.

#### **NAMING / NUMBERING OF MANAGED LANES AND MANAGED FACILITIES**

Initially, there was some discussion of numbering managed lanes differently than their general purpose lane counterparts. It was agreed that this was undesirable for a number of reasons, among which were potential difficulties in obtaining additional independent route numbers and potential for motorist confusion.

#### **Logo**

The Committee determined that branding, by means of a logo, would be desirable, in order to distinguish managed lanes / managed facilities from general purpose lanes / general purpose facilities. Among the options considered are those shown on the attached Logo Options sheets.

Purple was selected as a background for the route number / road name, primarily because this color is associated with electronic payment in Maryland and many other states. A white background was considered, but was not determined to provide enough contrast with existing route signs with white backgrounds (such as Interstate and Maryland route signs).

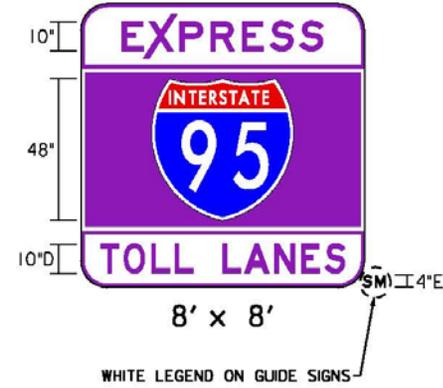
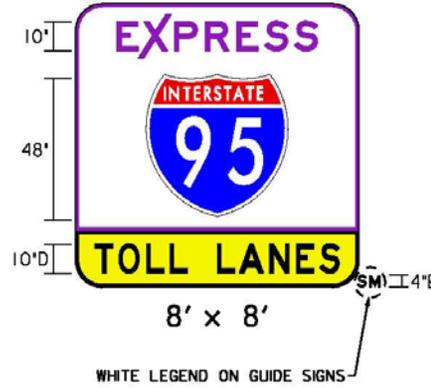
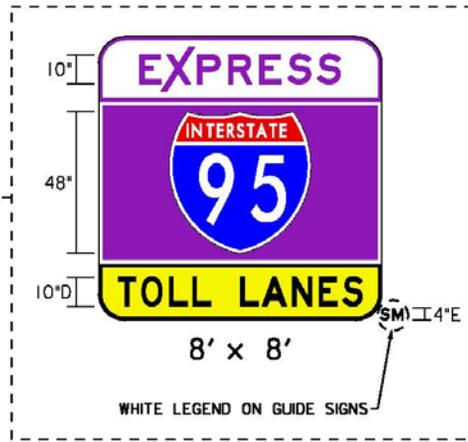
Since Maryland has begun marketing its first managed lanes project as an “Express Toll Lanes” project, it was decided that incorporating the word “Express” was important, in order to avoid confusion on the part of the general public. Purple text on white background was determined to provide appropriate contrast to the purple background used for the route number / road name. The use of italics for the word EXPRESS was also considered. Several layouts of the logo were developed using this approach, but it was determined that the italics decreased legibility of the logo as a whole. Thus, this approach was not selected.

Black text on yellow background was selected for the TOLL LANES or TOLL ROAD portion of the logo, in order to maintain consistency with current practice on other Authority roadways and practices of surrounding states. It was decided that the use of standard warning colors was appropriate in this case, since the intent is to warn motorists that a toll must be paid to use the managed lanes / managed facility. The regulatory message “PAY TOLL”, which is utilized in some states, was discussed, but was determined to be inappropriate for use on a logo whose function is informational, rather than regulatory.

## LOGO OPTIONS

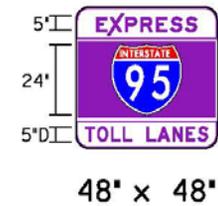
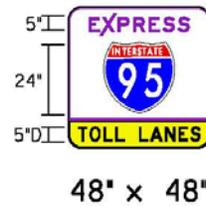
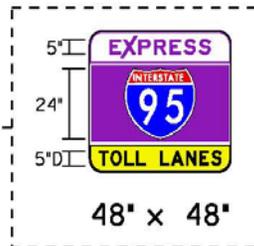
### GUIDE SIGN

PREFERRED  
OPTION



### ROUTE MARKER

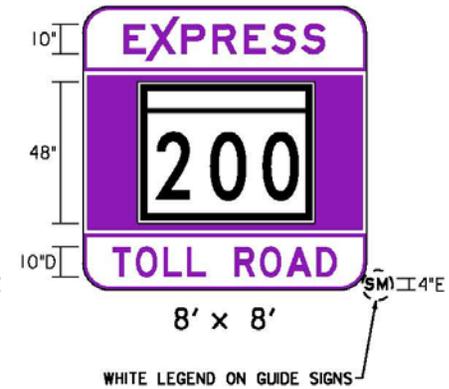
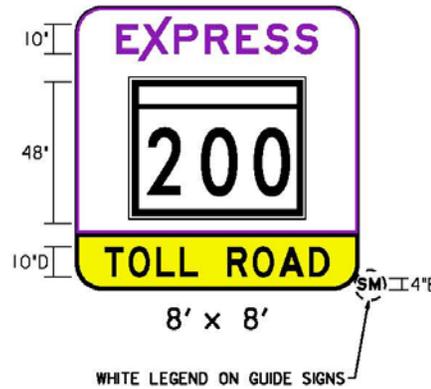
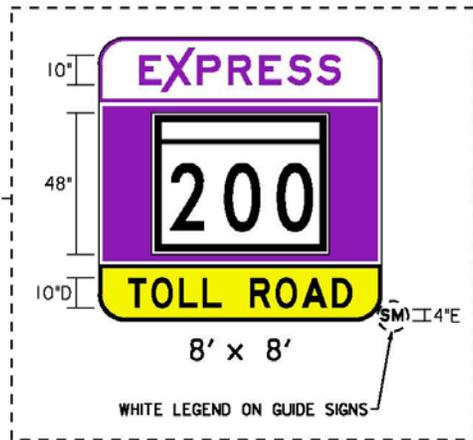
PREFERRED  
OPTION



## LOGO OPTIONS

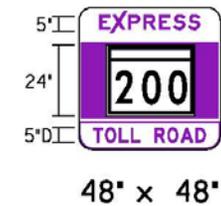
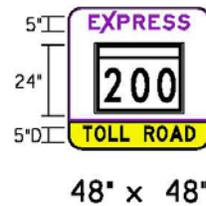
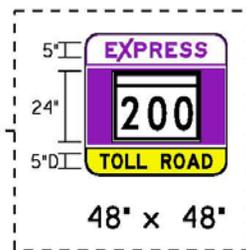
### GUIDE SIGN

PREFERRED  
OPTION



### ROUTE MARKER

PREFERRED  
OPTION



## **STATIC GUIDE SIGNS ON APPROACHES TO COMBINED MANAGED LANES / GENERAL PURPOSE LANES INTERCHANGES**

### **Payment Type Information Plaques**

Identification of *E-ZPass*<sup>®</sup> was determined to be important, since all facilities in the mid-Atlantic which accept this form of electronic payment state this on their signs, by means of an *E-ZPass*<sup>®</sup> logo. The colors used for this plaque are the service marked *E-ZPass*<sup>®</sup> colors.

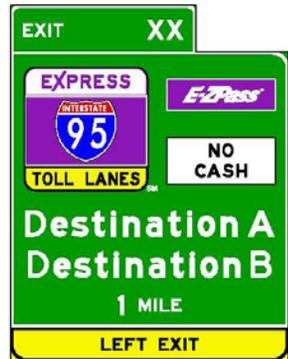
Based upon their experiences thus far with *E-ZPass*<sup>®</sup> only lanes at existing toll plazas in Maryland, Authority operations staff felt very strongly that the NO CASH plaque was desirable, at least during the initial years of operation. This was felt to be the case even if *E-ZPass*<sup>®</sup> was the only payment option available. As the attached “No Cash” Options sheet shows, several options were considered for this plaque, including various regulatory color combinations. It was decided that the black text on yellow background option was most appropriate, in order to maintain consistency with current Authority practice on its other facilities and with nearby states.

### **Layout Options**

Discussion of providing the payment type information plaques alongside the logo versus below the logo was extensive. A human factors specialist recommended that all related information be grouped together, and that such information be “stacked” (that is, positioned vertically). As shown on the attached Layout Options sheet, it was decided that the vertical option was preferable, for the following reasons:

- It allowed the logo to have the same “frame” as the payment type information plaques
- It allowed for a consistent location and size of the area dedicated to the payment type information plaques, whether two or three plaques were involved
- It allowed for the sign to have a shorter overall vertical dimension

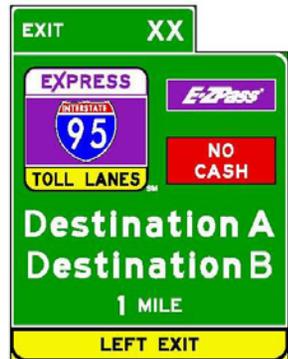
## "NO CASH" OPTIONS



REGULATORY COLORS



REGULATORY COLORS



REGULATORY COLORS



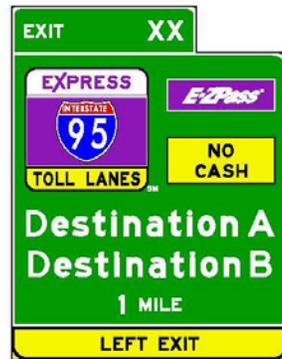
WARNING COLORS -  
MATCH NEIGHBORING STATES

PREFERRED  
OPTION

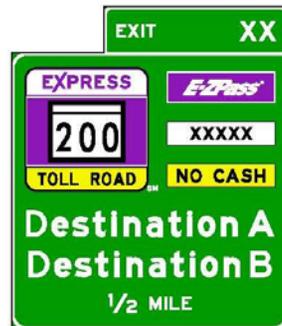
**Note:** "No Cash" is not a required message. However, the team feels that during the initial years of operation, customers may benefit from the reminder.

# LAYOUT OPTIONS

## VERTICAL



PREFERRED  
OPTION



## HORIZONTAL



Note: "No Cash" is not a required message. However, the team feels that during the initial years of operation, customers may benefit from the reminder.

## **DYNAMIC MESSAGE SIGNS ON APPROACHES TO MANAGED LANES / MANAGED FACILITIES**

### **Branding**

Once the logo was selected, it was felt that it was important to use the same information, with the same color scheme, on these dynamic message signs. One option considered was to replicate the logo on the left side of a dynamic message sign. This option was not selected, primarily due to concerns about readability and scale (if the logo was to fill the vertical dimension of the dynamic message sign).

Another option considered was using the top line of text in the dynamic message sign, rather than a banner, to brand the sign. It was felt that this was undesirable, in that it required the first line of the dynamic message sign to be dedicated to identification of the managed lane versus the adjacent general purpose lanes, and because the dynamic message sign font would be inconsistent with the logo. In addition, in some applications, more than a single line would be taken up by the location component of the message. For example, using a standard DMS, which provides 3 lines of text with approximately 17 to 22 characters per line, the following message would occupy 2 lines of the DMS: Line 1 = I-95 EXP TOLL LNS, Line 2 = NORTH 10 MILES. As described in Section 2 of this document, for incident management situations the DMS message must provide 3 components: identification of the problem, the location of the problem, and the recommended action / solution that drivers should follow. Were the location portion of the message to take up 2 lines of the 3 line DMS, the remainder of the required information would not be able to be provided on a single page message.

## **MESSAGE CONTENT AND PRIORITY FOR DYNAMIC MESSAGE SIGNS ON APPROACHES TO MANAGED LANES / MANAGED FACILITIES**

While the priority of messages has generally been agreed upon, message content is still under discussion by the Open Road Tolling Committee and the Division of Operations.

## **TOLL RATE SIGNS ON APPROACHES TO MANAGED LANES / MANAGED FACILITIES**

These signs are still under discussion. The anticipated quantity of message may require alternative methods of communication. These signs are shown on the attached sheets as partially dynamic, with the potential to provide at least one class of toll rates to the motorist. There is also discussion of providing information on these signs regarding the benefit of using the managed lane / managed facility. This information could include travel time savings or travel speeds.

## **POST-INTERCHANGE SIGNS ON MANAGED LANES / MANAGED FACILITIES**

The specific information to be conveyed on the Managed Lane / Managed Facility Post-interchange sign is still under discussion. It may vary from one facility to another. One possible legend is shown on the attached Recommended Signing on the Managed Facility sheet. Other possible information units would include a Highway Advisory Radio frequency, a dedicated phone number (with a maximum of four characters), and information regarding penalties for unauthorized use. This may require the use of an additional Motorist Information sign.



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Division of Engineering  
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