

Metropolitan Intelligent Transportation Systems (ITS) Infrastructure 2010 Freeway Management Survey

Detroit-Warren-Livonia, MI

Introduction

This survey is designed to obtain data measuring the level of Intelligent Transportation System (ITS) deployment on freeways. The results of this survey will be used to establish the extent of ITS deployment, to track deployment progress, and to report deployment status to Congress and other interested bodies.

Your participation is very important to ensuring a complete and accurate tracking of ITS deployment in the United States. Thank you for your assistance with this survey effort. Your cooperation is greatly appreciated.

Freeway Infrastructure

- 1. Total freeway centerline miles operated by your agency:
- 2. Total number of freeway centerline miles with real-time traffic data collection technologies (Does not include Closed Circuit TV):
 - 2a. Number of these miles where real-time traffic data are collected using roadside infrastructure such as loops, radar detectors, or video imaging detector systems:
 - 2b. Number of these miles where real-time traffic data are collected by vehicle probes, using technology such as toll tag readers, cell phones etc.:

IF VEHICLE PROBE DATA ARE COLLECTED, PLEASE ANSWER 3a and 3b:

3a. Who collects the vehicle probe data? (Check all that apply)

- My agency
- Other public agency
- Private sector

3b. What type of vehicle probe readers are used to obtain traffic information? (Check all that apply)

- Toll tag readers
- Blue tooth readers
- Cellular phone readers
- GPS readers
- License plate recognition
- Other readers (please specify):

4. Total miles of freeway centerline miles where information on traffic flow conditions are collected by agency reports ONLY (i.e., police radio reports are provided on a recurring basis to characterize traffic flow conditions, with NO roadside infrastructure or vehicle probe data collection):

5a. Total number of freeway traffic surveillance detector stations deployed by your agency:

5b. For each of the following technologies, please indicate the number deployed by your agency and the approximate percentage that is operational (e.g., working):

	Number Deployed	Percent Operational
Loop stations:	<input type="text" value="300"/>	<input type="text" value="15"/>
Radar stations:	<input type="text" value="76"/>	<input type="text" value="20"/>
Video imaging detector stations:	<input type="text" value="0"/>	<input type="text" value="0"/>
Toll tag readers:	<input type="text" value="0"/>	<input type="text" value="0"/>
Other stations (please specify):	<input type="text"/>	<input type="text"/>

6. Does your agency have in-pavement sensors to detect the condition of the pavement?

- Yes
- No

7. Has your agency deployed any Environmental Sensor Stations?

Yes, how many?

What data are collected? (Check all that apply):

- Temperature
- Humidity
- Wind speed
- Wind direction
- Precipitation (rain)
- Precipitation (snow)
- Other (please specify):

No

8. Number of freeway centerline miles covered by Highway Advisory Radio (HAR):

9. Total Number of permanent Dynamic Message Signs (DMS) deployed on freeways:

10. Does your agency use the DMS in the absence of incidents or special events?

- Yes, please describe:
- No

11. Does your agency have an agreement with a private vendor to push mobile alerts regarding incidents, roadway conditions, etc. to mobile media?

- Yes
- No

Ramp Control

12. Total number of freeway entrance ramps operated by your agency:

13. Does your agency have freeway entrance ramp metering capability?

- Yes
- No, SKIP TO QUESTION 22

14. Total number of ramps with ramp metering capability:

15. Total number of metered ramps with priority access capability for transit vehicles:

16. Total number of metered ramps with priority access capability for other vehicles (e.g., trucks):

17. Total number of High Occupancy Vehicle (HOV) bypass lanes at metered ramps:

18. Total number of metered ramps with preemption access capability for emergency vehicles:

19. Does your agency deploy automated enforcement technologies to assist with the enforcement of ramp metering compliance?

- Yes
- No

20. Is ramp meter timing adjusted in coordination with traffic signal timing for queue length management?

- Yes
- No

21. Under what circumstances do you meter traffic on ramps as a traffic management strategy? (Check all that apply)

- Time of day (recurrent congestion)
- Traffic incidents
- Planned special events
- Weather (e.g., fog, rain, snow)
- Evacuation
- Other (please specify):

22. Total number of ramps with automated ramp closure capability (e.g., during evacuations, emergencies, weather, etc.): IF 0 GO TO QUESTION 24

23. Under what circumstances do you close ramps as a traffic management strategy? (Check all that apply)

- Time of day (recurrent congestion)
- Traffic incidents
- Planned special events
- Weather (e.g., fog, rain, snow)
- Evacuation
- Other (please specify):

Managed Lanes

24. Total number of freeway centerline miles featuring managed lanes:

25. Please provide the estimated number of freeway centerline miles for each type of managed lane strategy:

Freeway Centerline Miles

- | | |
|---|--|
| a. Occupancy control (HOV): | <input style="width: 90%; height: 20px;" type="text"/> |
| b. High Occupancy Toll (HOT): | <input style="width: 90%; height: 20px;" type="text"/> |
| c. Express lanes (reversible flow): | <input style="width: 90%; height: 20px;" type="text"/> |
| d. Lane open/closed (traffic incidents, roadway maintenance, etc.): | <input style="width: 90%; height: 20px;" type="text"/> |
| e. Truck only: | <input style="width: 90%; height: 20px;" type="text"/> |
| f. Variable speed limit: | <input style="width: 90%; height: 20px;" type="text"/> |
| g. Hard shoulder running: | <input style="width: 90%; height: 20px;" type="text"/> |
| h. Other pricing or tolling (please specify): | <input style="width: 250px; height: 20px;" type="text"/> <input style="width: 50px; height: 20px;" type="text"/> |
| i. Other managed lane strategy (please specify): | <input style="width: 250px; height: 20px;" type="text"/> <input style="width: 50px; height: 20px;" type="text"/> |

Automated Enforcement

26. What automated enforcement technologies does your agency deploy? (Check all that apply)

- License plate recognition
- Video camera
- Toll tag readers
- Other (please specify):
- None. GO TO QUESTION 29

27. Does your agency deploy automated speed enforcement technologies on freeways?

- Yes
- No

28. Does your agency deploy automated enforcement technologies to enforce High Occupancy Vehicle (HOV) restrictions on freeways?

- Yes
- No

Freeway Incident Management

29. Please provide the freeway centerline miles covered by the following incident detection/verification methods:

- a. Closed Circuit Television (CCTV):
- b. Call boxes:
- c. Computer algorithms to detect incidents:

30. Total number of Closed Circuit Television cameras deployed on freeways:

31. Please indicate which of the following technologies your agency uses to detect freeway incidents: (Check all that apply)

- Inductive loop or acoustic roadway detectors
- Public Safety Computer Aided Dispatch
- Advanced Crash Notification
- Wireless enhanced 911
- Traveler reported photographs or video from cell phones
- Other (please specify):
- Do not detect incidents using technologies

32. Total number of freeway centerline miles patrolled by service patrol:

33. Have you used ITS at work zones?

- Yes: What ITS technologies does your agency deploy at work zones? (Check all that apply)
 - Intrusion alarm
 - Dynamic lane merge system
 - Queue detection and alert system
 - Variable speed limit
 - Portable Dynamic Message Signs
 - Other (please specify):
- No

34. Has your agency deployed any of the following safety systems?

- | | Yes | No |
|---|-------------------------------------|-------------------------------------|
| a. Over-height warning system | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. Automated and/or manual freeway ramp gates | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. Reference Location Signs | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d. Dynamic Curve Warning System | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Travel Reporting

35. What methods are used to disseminate traveler information on freeways by your agency? (Check all that apply)

- Webpage
- 511
- Other (non-511) telephone system
- Subscription Service
 - Email or alert to desktop
 - Email or alert to mobile device such cell phone or smart phone
- Posting on Twitter or other Social Networking Site
- Highway Advisory Radio
- Dynamic Message Signs
- Other (please specify):

36. Do you report travel time data on freeways using any of the methods in question 35?

Yes, please answer the following questions:

a. Which freeways are reported?

b. What travel time data are reported?

Travel time by segment

Travel time over selected route

Other (Please specify):

No

37. Do you report roadway or lane blocking incidents and events on freeways using any of the methods in question 35?

Yes, please answer the following questions:

a. Which freeways are reported?

b. What roadway or lane blocking incidents and events data are reported?

Incident location

Incident duration

Other (Please specify):

No

38. Do you report construction activities affecting travel conditions (e.g., lane closures) on freeways using any of the methods in question 35?

Yes, please answer the following questions:

a. Which freeways are reported?

b. What construction activities affecting travel conditions data are reported?

Construction location

Construction duration

Number of lanes closed

Other (please specify):

No

39. Do you report roadway weather observations on freeway segments using any of the methods in question 35?

Yes, please answer the following questions:

a. Which freeways are reported?

b. What roadway weather observations data are reported?

Temperature

Precipitation

Visibility restrictions

High winds

Other (please specify):

No

Corridor Management

40. Have you identified corridors for the purpose of integrating operations across freeways, major arterials, and/or public transit services?

Yes, please describe the corridor(s):

I-75 from M-102 to M-24; I-696 from I-96 to I-75

With which agencies do you coordinate operations related to the corridor?

County Road Commissions, municipalities, SMART bus system

No. GO TO QUESTION 42

41. What type of services are currently coordinated across the corridor, and what type of services are envisioned for the future: (Please check all that apply for each column)

	Currently Coordinated	Future
a. Cross Jurisdictional Traffic Signal Coordination	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Traffic Incident Management	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Real-time transfer of performance information	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Electronic toll tags used by other toll road operators	<input type="checkbox"/>	<input type="checkbox"/>
e. Traffic responsive signal timing	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Ramp control	<input type="checkbox"/>	<input type="checkbox"/>
g. Inclement weather traffic control strategies, treatments, warnings, or road closures	<input type="checkbox"/>	<input type="checkbox"/>
h. Transit operations	<input type="checkbox"/>	<input type="checkbox"/>
i. Other (please specify): 	<input type="checkbox"/>	<input type="checkbox"/>

Level of Integration

42. Does your agency receive, in real-time, incident information (e.g., clearance activities, type, severity, etc.) from any public safety agency?

Incident Clearance Yes No

Incident Severity and Type Yes No

43. Does your agency provide, in real-time, incident information (e.g., type, severity, etc.) and/or freeway information (e.g., travel times, speed and conditions) to the following types of agencies? (Check all that apply)

	Incident Information (e.g., type, severity, etc.)		Freeway Information (e.g., travel times, speed, etc.)	
	Yes	No	Yes	No
Freeway Management Agencies	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Arterial Management Agencies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Public Transit Agencies	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Law Enforcement Public Safety Agencies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Fire Rescue Public Safety Agencies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

44. Does your agency have any formal Agreements or Partnerships with private sector organizations or firms?

Yes, please answer subquestions a-c

a. What is the purpose of the agreement or partnership? (Check all that apply)

Funding or financing transportation project

Operating transportation assets

Other (please specify):

b. Please specify what type(s) of agreement(s): (Check all that apply)

Partnership

Memorandum of Agreement

Other (please specify):

c. Are any of the Agreements the result of legislation (e.g. required by state law or mandate)?

Yes

No

No

45. Does your agency operate a Transportation Management Center (TMC)?

Yes

TMC Name:

TMC Coverage:

No

Data Collection and Archiving

46. Does your agency archive any operations data?

Yes

No, SKIP TO QUESTION 50

47. What information does your agency archive from sensors? (Check all that apply)

- Traffic volumes
- Traffic speeds
- Lane occupancy
- Vehicle classification
- Travel Time
- Road conditions (e.g., wet, icy, etc.)
- Weather conditions (e.g., snow, fog, rain, etc.)
- Video surveillance
- Other (please specify):
- None

48. What information does your agency archive from other sources? (Check all that apply)

- Route designations (snow emergency, etc.)
- Current road work zones
- Scheduled road work zones
- Messages from Dynamic Message Signs (DMS)
- Intermodal (air, rail, water) connections
- Emergency/evacuation routes and procedures
- Vehicle occupancy
- Violation rates for HOV lanes
- Incident type
- Incident detection time
- Incident response time
- Incident clearance time
- Secondary incident information
- Other (please specify):
- None

49. What are the data used for? (Check all that apply)

- Traffic analysis
- Construction impact determination
- Capital planning/analysis
- Operation planning/analysis
- Incident detection algorithm development
- Roadway impact analysis
- Accident prediction models
- Dissemination to the public
- Monitor system performance
- Safety analysis
- Traffic simulation modeling
- Traffic control
- Travel time prediction
- Other (please specify):

System Performance

50. Which of the following measures are used to report on the performance of the freeway system? (Check all that apply)

- Travel time
- Travel time reliability
- Vehicles per lane per mile
- Vehicles per hour
- Person throughput per lane per hour
- Person throughput per hour
- Average auto occupancy
- Other (please specify): Subjective measures (service patrol assists, # incidents)
- Performance measures are not used

51. Have you established performance goals for the following types of incident clearance?

	Yes	No
Major	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Moderate	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minor	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ITS Funding

52. Does your agency have a separate budget for ITS?

- Yes: Please indicate whether you track the budget separately for each of the following categories (Check all that apply)
 - ITS Deployments
 - ITS Operations and Maintenance
 - Traffic Management or Operations Center
 - Other (please specify): Also include devices in larger road/bridge capital improvement projects.
 - Do not track categories separately
- No

ITS Purchase Decisions

53. Please rate the importance of each of the following factors to your agency's decision to purchase ITS technologies:

<i>Factor</i>	Not at all Important	Not very Important	Neutral	Somewhat Important	Very Important
Price of equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Public/constituent's involvement	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Funding/grant availability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mobility benefits (e.g., to address congestion)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Safety benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Environmental benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Integration with other agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Integration with your current technologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Already used by other agencies	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

54. Does your agency have any plans to invest in new ITS technology or to expand current ITS coverage in 2010 through 2013?

Yes: (Check all that apply.)

Invest in new ITS, please describe:

Expand current ITS coverage

No

Benefits of Technologies

55. Based on your agency's experience, please rate the benefit of the following ITS technologies:

Technology	No Benefit		Moderate Benefit		Significant Benefit	No Experience
	1	2	3	4	5	
Sensors Loops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicle Probes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Toll Tags	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cameras	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ramp Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lane Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Traveler Information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Automated Enforcement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Archived Data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

56. Please use the space below to provide any additional comments regarding your agency's deployment, operations or maintenance of ITS. (Please be as specific as possible when commenting on particular ITS technologies.)

Modeling and Decision Support

57. Does your agency use any analysis, modeling and simulation tools to model the freeway systems?

Yes, please describe:

No

58. Has your agency deployed a decision support system to assist in operations of the following? (Check all that apply)

Corridors

Road weather management

Incident management

Emergency management

Evacuation

Maintenance

No decision support system deployed

Other (please specify):