# 2010 ITS Deployment Tracking National Survey

# Survey Summary Report

# Freeway Management

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# About This Report

For more than a decade, the Intelligent Transportation Systems Joint Program Office (ITS JPO) of the Research and Innovative Technology Administration (RITA) has tracked the deployment of ITS technology through a series of national surveys of metropolitan transportation agencies.  This data collection effort targets agencies involved with freeway, arterial, and transit management, public safety (law enforcement and fire/rescue/emergency medical), and toll collection, as well as transportation management systems.  The most recent survey, conducted in 2010, involved distribution of 1600 surveys covering 108 metropolitan areas with a response rate of 85%.

This report covers the Freeway Management survey, and represents the results from a total of 122 responding agencies.  This is one of a series of survey summaries for each of the survey types that provide an initial look at the data from the 2010 national survey.  These summaries are limited to reporting the number of agencies responding to specific questions in the survey.  Additional reports will be produced that cover counts and coverage of deployment of individual technologies, including deployment trends, covering national totals as well as individual cities and agencies.  In addition, the 2010 survey results will be posted on line at: http://www.itsdeployment.its.dot.gov/ where results from earlier surveys are also available.

# Freeway Infrastructure

Number of Freeway Management agencies that responded: **122**

Number of agencies with freeway centerline miles with real-time traffic data collection technologies (Does not include Closed Circuit TV): **96**

Number of agencies where real-time traffic data are collected using roadside infrastructure such as loops, radar detectors, or video imaging detector systems: **83**

Number of agencies where real-time traffic data are collected by vehicle probes, using technology such as toll tag readers, cell phones etc.: **30**

Number of agencies where vehicle probe data is collected by:

| | |
|---|---|
| My agency | 24 |
| Private sector | 20 |
| Other public agency | 10 |

Number of agencies that use the following type of vehicle probe readers to obtain traffic information:

| | |
|---|---|
| Toll tag readers | 21 |
| GPS readers | 15 |
| Cellular phone readers | 11 |
| Other readers | 6 |
| Blue tooth readers | 5 |
| License plate recognition | 1 |

Number of agencies 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): **50**

Number of agencies with freeway traffic surveillance detector stations deployed: **88**

Number of agencies that deploy each of the following technologies:

| | |
|---|---|
| Radar stations: | 66 |
| Loop stations: | 48 |
| Toll tag readers: | 17 |
| Video imaging detector stations: | 15 |
| Other stations | 10 |

Number of agencies that have in-pavement sensors to detect the condition of the pavement: **48**

Number of agencies that have deployed any Environmental Sensor Stations: **74**

Number of agencies that collect:

| | |
|---|---|
| Temperature | 76 |
| Wind speed | 72 |
| Humidity | 71 |
| Wind direction | 69 |
| Precipitation (rain) | 66 |
| Precipitation (snow) | 52 |
| Other | 23 |

Number of agencies with freeway centerline miles covered by Highway Advisory Radio: **76**

Number of agencies with permanent Dynamic Message Signs (DMS) deployed on freeways: **102**

Number of agencies that use the DMS in the absence of incidents or special events: **85**

Number of agencies that have an agreement with a private vendor to push mobile alerts regarding incidents, roadway conditions, etc. to mobile media: **22**

## Ramp Control

Number of agencies that have freeway entrance ramp metering capability: **27**

Number of agencies with metered ramps with priority access capability for transit vehicles: **5**

Number of agencies with High Occupancy Vehicle (HOV) bypass lanes at metered ramps: **10**

Number of agencies with metered ramps with preemption access capability for emergency vehicles: **1**

Number of agencies that deploy automated enforcement technologies to assist with the enforcement of ramp metering compliance: **2**

Number of agencies that adjust ramp meter timing in coordination with traffic signal timing for queue length management: **5**

Number of agencies that meter traffic on ramps under the following circumstances as a traffic management strategy:

| | |
|---|---|
| Time of day (recurrent congestion) | 26 |
| Traffic incidents | 15 |
| Planned special events | 11 |
| Other | 6 |
| Weather (e.g., fog, rain, snow) | 3 |
| Evacuation | 2 |

Number of agencies that operate ramps with automated ramp closure capability (e.g., during evacuations, emergencies, weather, etc.): **6**

Number of agencies that close ramps under the following circumstances as a traffic management strategy:

| | |
|---|---|
| Traffic incidents | 30 |
| Planned special events | 20 |
| Weather (e.g., fog, rain, snow) | 15 |
| Evacuation | 14 |
| Other | 7 |
| Time of day (recurrent congestion) | 2 |

## Managed Lanes

Number of agencies with freeway centerline miles featuring managed lanes: **43**

Number of agencies with each type of managed lane strategy:

| | |
|---|---|
| Occupancy control (HOV) | 22 |
| Express lanes (reversible flow) | 10 |
| Variable speed limit | 9 |
| Other pricing or tolling | 9 |
| High Occupancy Toll (HOT) | 8 |
| Hard shoulder running | 5 |
| Lane open/closed (traffic incidents, roadway maintenance, etc.) | 2 |
| Truck only | 1 |

## Automated Enforcement

Number of agencies that deploy any of the following automated enforcement technologies:

| | |
|---|---|
| Video camera | 12 |
| Toll tag readers | 12 |
| License plate recognition | 10 |

Number of agencies that deploy automated speed enforcement technologies on freeways: **2**

Number of agencies that deploy automated enforcement technologies to enforce High Occupancy Vehicle (HOV) restrictions on freeways: **0**

## Freeway Incident Management

Number of agencies that user any of the following incident detection/verification methods:

| | |
|---|---|
| Closed Circuit Television (CCTV) | 105 |
| Computer algorithms to detect incidents | 30 |
| Call boxes | 24 |

Number of agencies that have Closed Circuit Television cameras deployed on freeways: **106**

Number of agencies that use any of the following technologies to detect freeway incidents:

| | |
|---|---|
| Public Safety Computer Aided Dispatch | 46 |
| Inductive loop or acoustic roadway detectors | 36 |
| Do not detect incidents using technologies | 25 |
| Wireless enhanced 911 | 14 |
| Traveler reported photographs or video from cell phones | 12 |
| Advanced Crash Notification | 3 |

Number of agencies that deploy service patrols: **90**

Number of agencies that use ITS at work zones: **99**

Number of agencies that deploy any of the following ITS technologies work zones:

| | |
|---|---|
| Portable Dynamic Message Signs | 100 |
| Other | 23 |
| Queue detection and alert system | 19 |
| Dynamic lane merge system | 7 |
| Variable speed limit | 4 |
| Intrusion alarm | 1 |

Number of agencies that have deploy any of the following safety systems:

| | |
|---|---|
| Reference Location Signs | 46 |
| Over-height warning system | 27 |
| Dynamic Curve Warning System | 26 |
| Automated and/or manual freeway ramp gates | 15 |

## Travel Reporting

Number of agencies that user the following methods to disseminate traveler information on freeways:

| | |
|---|---|
| Webpage | 109 |
| Dynamic Message Signs | 106 |
| 511 | 82 |
| Highway Advisory Radio | 75 |
| Email or alert to desktop | 60 |
| Email or alert to mobile device such cell phone or smart phone | 58 |
| Posting on Twitter or other social networking site | 50 |
| Subscription service | 41 |
| Other (non-511) telephone system | 23 |

Freeway travel time data reporting:

| | |
|---|---|
| Number of agencies that report freeway travel time data on freeways | 64 |
| Number of agencies that report travel time by segment | 42 |
| Number of agencies that report ravel time over selected route | 32 |
| Number of agencies that report other types of travel time | 12 |

Lane blocking incident and events reporting:

| | |
|---|---|
| Number of agencies that report roadway or lane blocking incidents and events on freeways | 109 |
| Number of agencies that report roadway or lane blocking incidents and events by incident location | 103 |
| Number of agencies that report roadway or lane blocking incidents and events by incident duration | 61 |
| Number of agencies that report other type of roadway or lane blocking incidents and events | 27 |

Construction activities affecting travel conditions reporting:

| | |
|---|---|
| Number of agencies that report construction activities affecting travel conditions (e.g., lane closures) on freeways | 115 |
| Number of agencies that report construction location | 107 |
| Number of agencies that report number of lanes closed | 103 |
| Number of agencies that report construction duration | 89 |
| Number of agencies that report other construction activities | 17 |

Roadway weather observations reporting:

| | |
|---|---|
| Number of agencies that report roadway weather observations | 78 |
| Number of agencies that report visibility restrictions | 45 |
| Number of agencies that report precipitation | 41 |
| Number of agencies that report high winds | 35 |
| Number of agencies that report other roadway weather observations | 28 |
| Number of agencies that report temperature | 19 |

## Corridor Management

Number of agencies that have identified corridors for the purpose of integrating operations across freeways, major arterials, and/or public transit services: **46**

Number of agencies that currently coordinate across the corridor, and what type of services are envisioned for the future by service type:

| Service | Number of agencies | |
|---|---|---|
| | Currently Coordinated | Future |
| Cross jurisdictional traffic signal coordination | 20 | 25 |
| Traffic incident management | 48 | 18 |
| Real-time transfer of performance information | 14 | 28 |
| Electronic toll tags used by other toll road operators | 8 | 11 |
| Traffic responsive signal timing | 12 | 27 |
| Ramp control | 8 | 17 |
| Inclement weather traffic control strategies, treatments, warnings, or road closures | 34 | 14 |
| Transit operations | 6 | 20 |

## Level of Integration

Number of agencies that receive, in real-time, incident information (e.g., clearance activities, type, severity, etc.) from any public safety agency:

| Agency | Number of agencies |
|---|---|
| Incident Clearance | 85 |
| Incident Severity and Type | 85 |

Number of agencies that provide/do not 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:

| Agency Type | Incident Information (e.g., type, severity, etc.) | | Freeway Information (e.g., travel times, speed, etc.) | |
|---|---|---|---|---|
| | Provide | Do not provide | Provide | Do not provide |
| Freeway Management Agencies | 63 | 43 | 42 | 54 |
| Arterial Management Agencies | 49 | 53 | 30 | 64 |
| Public Transit Agencies | 37 | 70 | 18 | 76 |
| Law Enforcement Public Safety Agencies | 85 | 27 | 44 | 55 |
| Fire Rescue Public Safety Agencies | 61 | 44 | 34 | 64 |

Number of agencies that have any formal Agreements or Partnerships with private sector organizations or firms: **37**
- Number of agencies were the purpose of the agreement is to fund or finance a transportation project: **6**
- Number of agencies were the purpose of the agreement is to operate transportation assets: **24**
- Number of agencies were the purpose of the agreement is another reason: **22**
- Number of agencies were the type(s) of agreement(s) is a Partnership: **8**
- Number of agencies were the type(s) of agreement(s) is a Memorandum of Agreement: **27**
- Number of agencies were the type(s) of agreement(s) is another type: **10**
- Number of agencies were any of the Agreements are the result of legislation (e.g. required by state law or mandate): **4**
- Number of agencies were any of the Agreements are NOT the result of legislation (e.g. required by state law or mandate): **33**

Number of agencies that operate a Transportation Management Center (TMC): **90**

# Data Collection and Archiving

Number of agencies that archive any operations data: **95**

Number of agencies that archive the following information from sensors:

| | |
|---|---|
| Traffic volumes | 86 |
| Traffic speeds | 83 |
| Lane occupancy | 62 |
| Vehicle classification | 53 |
| Travel Time | 36 |
| Road conditions (e.g., wet, icy, etc.) | 24 |
| Weather conditions (e.g., snow, fog, rain, etc.) | 20 |
| Video surveillance | 5 |

Number of agencies that archive information from other sources:

| | |
|---|---|
| Incident type | 60 |
| Messages from Dynamic Message Signs (DMS) | 58 |
| Incident clearance time | 55 |
| Incident detection time | 54 |
| Incident response time | 51 |
| Current road work zones | 40 |
| Scheduled road work zones | 37 |
| Secondary incident information | 30 |
| Emergency/evacuation routes and procedures | 24 |
| None | 15 |
| Vehicle occupancy | 7 |
| Intermodal (air, rail, water) connections | 4 |
| Route designations (snow emergency, etc.) | 3 |
| Violation rates for HOV lanes | 2 |

Number of agencies that use the data for:

| | |
|---|---|
| Traffic analysis | 84 |
| Operation planning/analysis | 73 |
| Capital planning/analysis | 58 |
| Construction impact determination | 57 |
| Monitor system performance | 49 |
| Safety analysis | 49 |
| Traffic control | 38 |
| Travel time prediction | 38 |
| Traffic simulation modeling | 35 |
| Dissemination to the public | 34 |
| Roadway impact analysis | 31 |
| Incident detection algorithm development | 20 |
| Accident prediction models | 6 |

## System Performance

Number of agencies that use the following measures to report on the performance of the freeway system:

| | |
|---|---|
| Travel time | 36 |
| Vehicles per hour | 36 |
| Performance measures are not used | 27 |
| Vehicles per lane per mile | 24 |
| Travel time reliability | 23 |
| Average auto occupancy | 17 |
| Person throughput per lane per hour | 2 |
| Person throughput per hour | 2 |

Number of agencies that have establish performance goals for the following types of incident clearance:

| Incident type | Have |
|---|---|
| Major | 64 |
| Moderate | 47 |
| Minor | 42 |

## ITS Funding

Number of agencies that have a separate budget for ITS:  **80**

Number of agencies that track the budget separately for each of the following categories:

| | |
|---|---|
| ITS Operations and Maintenance | 73 |
| Traffic Management or Operations Center | 63 |
| ITS Deployments | 58 |

# ITS Purchase Decisions

Number of agencies that rated the importance of each of the following factors to your agency's decision to purchase ITS:

| Factor | Not at all Important | Not very Important | Neutral | Somewhat Important | Very Important |
|---|---|---|---|---|---|
| Price of equipment | 0 | 2 | 14 | 64 | 35 |
| Public/constituent's involvement | 2 | 14 | 46 | 37 | 16 |
| Funding/grant availability | 3 | 3 | 15 | 29 | 66 |
| Mobility benefits (e.g., to address congestion) | 0 | 1 | 7 | 45 | 61 |
| Safety benefits | 0 | 2 | 7 | 26 | 78 |
| Environmental benefits | 1 | 8 | 37 | 42 | 26 |
| Integration with other agencies | 0 | 14 | 21 | 49 | 29 |
| Integration with your current technologies | 0 | 2 | 7 | 30 | 75 |
| Already used by other agencies | 2 | 15 | 43 | 46 | 6 |

Number of agencies that have any plans to invest in new ITS technology or to expand current ITS coverage in 2010 through 2013: **102**
- Invest in new ITS: **67**
- Expand current ITS coverage: **96**

# Benefits of Technologies

Number of agencies that rated the benefits of the following technologies based on their experience:

| Technology | No Benefit 1 | 2 | Moderate Benefit 3 | 4 | Major Benefit 5 | No Experience |
|---|---|---|---|---|---|---|
| Sensors Loops | 1 | 1 | 20 | 17 | 60 | 20 |
| Vehicle Probes | 6 | 2 | 7 | 16 | 13 | 72 |
| Toll Tags | 1 | 2 | 8 | 5 | 26 | 75 |
| Cameras | 0 | 1 | 3 | 8 | 101 | 7 |
| Ramp Control | 0 | 1 | 5 | 8 | 22 | 78 |
| Lane Management | 1 | 5 | 3 | 16 | 20 | 64 |
| Traveler Information | 0 | 1 | 4 | 23 | 71 | 19 |
| Automated Enforcement | 1 | 1 | 2 | 2 | 6 | 101 |
| Archived Data | 2 | 2 | 26 | 23 | 30 | 29 |

# Modeling and Decision Support

Number of agencies that use any analysis, modeling, and simulation tools to model the freeway systems: **63**

Number of agencies that deployed a decision support system to assist in operations of the following:

| | |
|---|---|
| No decision support system deployed | 46 |
| Incident management | 40 |
| Emergency management | 33 |
| Maintenance | 33 |
| Road weather management | 26 |
| Evacuation | 25 |
| Corridors | 16 |