

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

Instructions

This survey is designed to obtain data measuring the level of Intelligent Transportation System (ITS) deployment on arterials. 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.

Agency Characteristics

1. Total number of centerline arterial miles operated by your agency: **TotalMiles**
2. Total number of signalized intersections operated by your agency: **TotalSignals**
3. Does your agency have a documented plan to guide the management, operation and maintenance of traffic signals?
 Yes **documented_plan** **1 = Yes, 2 = No, 3 = No Response**
 No

System Performance

4. Does your agency regularly measure the performance of traffic signals? **measure_performance**
 Yes, please indicate the methods used to gather data: (Check all that apply) **1 = Yes, 2 = No, 3 = No Response**
 Manual methods are primarily used (citizen complaints) **measure_performance_manual**
 Automated methods are used (travel time, cycle failure, queue length, speed) **measure_performance_automated**
 No
5. Are queue lengths at intersections detected? **queue_length_detected** **1 = Yes, 2 = No, 3 = No Response**
 Yes, number of signalized intersections where queue lengths are detected by advanced detectors:
 No **queue_detected_number_intersections**
6. Total miles of arterial streets where information on travel time conditions is collected in real time using roadside infrastructure devices such as loops, radar detectors, and video image detector systems **miles_info_collected**

IF VEHICLE PROBE DATA ARE COLLECTED, PLEASE ANSWER 7a - 7c

- 7a. Total miles of arterial streets where information on travel time conditions is collected in real time by vehicle probes, using technology such as toll tag readers, cell phones etc.: **ProbeDataMiles**
- 7b. Who collects the vehicle probe data? (Check all that apply)
 My agency **ProbeDataAgency**
 Other public agency **ProbeDataOtherAgency**
 Private vendor **ProbeDataVendor**
- 7c. What type of vehicle probe readers are used to obtain traffic information? (Check all that apply)
 Toll tag readers **vehicle_probe_toll**
 Blue tooth readers **vehicle_probe_blue**
 Cellular phone readers **vehicle_probe_cell**
 GPS readers **vehicle_probe_gps**
 License plate recognition **vehicle_probe_license**
 Other readers (please specify): **vehicle_probe_othertext**

Hardware Characteristics of Signalized Intersections

8. How many of the following signal controllers are deployed by your agency?

	Number Deployed	
TS 2:	controller_number_ts2	
Model 170:	controller_number_170	
Model 2070:	controller_number_2070	
Other (please specify):	controller_other	controller_number_other

9. Number of signalized intersections with electronic data collection capabilities: number_intersections_data_coll

10. Number of signalized intersections that utilize the following detection technologies:

	Number of Signalized Intersections	
a. Loop detectors (volumes, speed, and density):	number_inter_loop	
b. Video image detection cameras (volume, speed, and density):	number_inter_video	
c. Radar	number_inter_radar	
d. Other (please specify):	number_inter_other	number_inter_othertext

11. Number of signalized intersections equipped with Closed Circuit Television Cameras (CCTV) for the purpose of monitoring traffic flow: number_intersections_cctv

Operational Strategies

12. Number of signalized intersections operated by your agency that utilize the following control modes, and the estimated percentage that are connected to a Traffic Management Center (TMC):

	Number of Signalized Intersections	% Connected to TMC
Fully actuated:	traffic_signals_fully_number	traffic_signals_fully_percent
Semi-actuated:	traffic_signals_semi_number	traffic_signals_semi_percent
Pre-timed:	traffic_signals_pretimed_number	traffic_signals_pretimed_percent

13. Number of signalized intersections that operate in either an isolated (uncoordinated) or coordinated (common cycle length with time-based coordination using offsets) mode.

Isolated:	traffic_signals_isolated	
Coordinated:	traffic_signals_coordinated	(if 0, skip to question 15)

14. Number of signalized intersections coordinated using any of the following methods:

	Number of signalized intersections
Closed-loop with field masters only (no central management system):	coord_sig_loop_no_central_control
Closed-loop with field masters and central management system:	coord_sig_loop_central_control
Central management system (second-by-second control):	coord_sig_central_mgt

15. Number of intersections actively using a traffic responsive signal timing plan: number_inter_traffic_resp

16. Does your agency use adaptive control technology to manage the effectiveness of signal timing?

Yes, number of signalized intersections under the following traffic adaptive control: **use_adaptive_control**

SCOOT: **number_inter_scoot**

SCATS: **number_inter_scats**

RHODES: **number_inter_rhodes**

OPAC: **number_inter_opac**

ACSLite: **number_inter_acslite**

InSync: **number_inter_insync**

Other (please specify): **number_inter_adaptive_other** **number_inter_adaptive_othertext**

No, what does your agency consider the most significant barrier to implementing adaptive control? (Select one)

1 Cost to deploy **barriers_adaptive** **6 = No Response**

2 Cost to operate & maintain

3 Complexity to operate and maintain

4 Uncertainty about benefits

5 Incompatibility with existing system

17. Does your agency participate in a regional coordination of traffic signal timing plans?

Yes **Participate_regional**

No **1 = Yes, 2 = No, 3 = No Response**

18. Does your agency operate optimization software to time signals?

Yes (please specify): **Optimization_software** **Optimization_software_text**

No **1 = Yes, 2 = No, 3 = No Response**

19. Does your agency operate any of the following lane control strategies? **lane_control_operate**

Yes (Check all that apply) **1 = Yes, 2 = No, 3 = No Response**

Reversible lanes **lane_control_reversible**

HOV lanes **lane_control_hov**

Other (please specify): **lane_control_other_text**

No

20. Does your agency use any analysis, modeling and simulation (AMS) tools to model the arterial system?

Yes (please specify): **modeling_simulation** **modeling_simulation_text**

No **1 = Yes, 2 = No, 3 = No Response**

Preemption & Priority

21. Number of signalized intersections that allow for signal preemption for emergency vehicles: **Signals_preemption_emergency**

IF YOUR AGENCY HAS SIGNAL PREEMPTION CAPABILITIES, PLEASE ANSWER QUESTION 21a:

21a. If your agency does not use its signal preemption capabilities for emergency vehicles, please tell us why.

Preemption_not_used_why

22. Number of signalized intersections that allow for signal priority for transit vehicles: **Preemption_not_used_why**

IF YOUR AGENCY HAS TRANSIT SIGNAL PRIORITY CAPABILITIES, PLEASE ANSWER QUESTIONS 22a-22b:

22a. Method of signal timing intervention used: (Check all that apply)

- Green time extension **Signals_priority_method_green**
- Phase truncation (preemption) **Signals_priority_method_phase**

22b. If your agency does not use its signal priority capabilities for transit vehicles, please tell us why.

Priority_not_used_why

23. Number of signalized intersections within 200 feet of a highway-rail intersection that adjust signal timing in response to train crossing to avoid vehicle entrapment:

HRI_200_feet

Automated Enforcement

24. Does your agency use automated enforcement in facilities under its jurisdiction?

- Yes **auto_enforcement**
- No (GO TO QUESTION 28) **1 = Yes, 2 = No, 3 = No Response**

25. What types of automated enforcement are used? (Check all that apply)

- Speeding **auto_enfor_speed**
- Rail road crossings **auto_enfor_rail_road**
- Red light running **auto_enfor_red_light** **auto_enfor_red_light_number**

Number of signalized intersections with automated photo red-light running enforcement:

- Other (please specify): **auto_enfor_othertext**

26. With what agencies are the automated enforcement data shared?

auto_enfor_shared

27. With what agencies are the automated enforcement data coordinated?

auto_enfor_coord

Travel Reporting

28. Number of permanent Dynamic Message Signs (DMS) deployed on arterials:

DMS_number

29. Number of arterial centerline miles covered by Highway Advisory Radio (HAR):

HAR_miles

30. What methods are used to disseminate traveler information on arterials? (Check all that apply)

- Webpage **method_traveler_Web**
- 511 **method_traveler_511**
- Other (non-511) telephone system **method_traveler_other_phone**
- Subscription service **method_traveler_subscription**
 - Email or alert to desktop **method_traveler_email_desktop**
 - Email or alert to mobile device such cell phone or smart phone **method_traveler_email_mobile**
- Posting on Twitter or other social networking site **method_traveler_social**
- Highway Advisory Radio **method_traveler_har**
- Dynamic Message Signs **method_traveler_dms**
- Other (please specify): **method_traveler_OtherText**

31. Do you report arterial travel time data on arterials using any of the methods in question 30?

- Yes, what travel time data are reported? (Check all that apply) **report_travel_time_data**
- Travel time by segment **report_travel_time_data_segment** 1 = Yes, 2 = No, 3 = No Response
 - Travel time over selected route **report_travel_time_data_route**
 - Other (please specify): **report_travel_time_OtherText**
- No

32. Do you report roadway or lane blocking incidents and events on arterials using any of the methods in question 30?

- Yes, what roadway or lane blocking incidents and events data are reported? (Check all that apply)
- Incident location **report_blocking_incidents_location** **report_blocking_incidents**
 - Incident duration **report_blocking_incidents_duration** 1 = Yes, 2 = No, 3 = No Response
 - Other (please specify): **report_blocking_incidents_OtherText**
- No

33. Do you report construction activities affecting travel conditions (e.g., lane closures) on arterials using any of the methods in question 30?

- Yes, what construction activities affecting travel conditions data are reported to the public? (Check all that apply)
- Construction location **report_construction_location** **report_construction**
 - Construction duration **report_construction_duration** 1 = Yes, 2 = No, 3 = No Response
 - Number of lanes closed **report_construction_lanes_closed**
 - Other (please specify): **report_construction_OtherText**
- No

34. Do you report roadway weather observations on arterials using any method in question 30?

- Yes, what roadway weather observations data are reported? (Check all that apply) **report_weather**
- Temperature **report_weather_temperature** 1 = Yes, 2 = No, 3 = No Response
 - Precipitation **report_weather_precipitation**
 - Other (please specify): **report_weather_OtherText**
- No

Arterial Incident Management

35. Number of arterial miles patrolled by service patrols: **Miles_service_patrols**

36. Number of arterial miles covered by each of the following incident detection/verification methods:

Arterial Miles Covered

- a. Computer algorithms: **Miles_comp_algor**
- b. CCTV: **Miles_cctv**

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

- Inductive loop or acoustic roadway detectors **detect_incidents_inductive**
- Public Safety Computer Aided Dispatch **detect_incidents_cad**
- Mayday or Advanced Crash Notification **detect_incidents_mayday**
- Wireless enhanced 911 **detect_incidents_e911**
- Traveler reported photographs or video from cell phones **detect_incidents_traveler**
- Other (please specify): **detect_incidents_othertext**
- Do not detect incidents using technologies **detect_incidents_do_not**

38. Does your agency deploy variable speed systems? **variable_speed**
 Yes **1 = Yes, 2 = No, 3 = No Response**
 No

Safety and Weather Capabilities

39. Does your agency use electronic technologies to improve the safety and mobility of pedestrians or bicyclists?
 Yes, what types of technologies are used? (Check all that apply) **improve_safety_pedestrians**
 Countdown pedestrian signals **improve_safety_tech_countdown** **1 = Yes, 2 = No, 3 = No Response**
 Automatic pedestrian detection **improve_safety_tech_auto**
 Smart lighting (originators when pedestrians are present) **improve_safety_tech_smart**
 Dynamic no right turn on red signs **improve_safety_tech_dynamic**
 In-roadway flashing lights **improve_safety_tech_inroad**
 Pedestrian-activated flashing beacons **improve_safety_tech_flashing**
 Bicyclist-activated signals **improve_safety_tech_bicyclist**
 Other (please specify): **improve_safety_tech_othertext**
 No

40. Does your agency have in-pavement sensors to detect the condition of the pavement?
 Yes **inpavement_sensors**
 No **1 = Yes, 2 = No, 3 = No Response**

41. Has your agency deployed any Environmental Sensor Stations (ESS)? **DeployESS** **1 = Yes, 2 = No, 3 = No Response**
 Yes, how many? **DeployESS_How_Many**
 What data are collected? (Check all that apply)
 Temperature **ESS_temp**
 Humidity **ESS_humidity**
 Wind speed **ESS_wind_speed**
 Precipitation (rain) **ESS_rain**
 Precipitation (snow) **ESS_snow**
 Other (please specify): **ESS_othertext**
 No

42. Does your agency have traffic signal plans designed specifically for inclement weather? **signal_plans_inclement**
1 = Yes, 2 = No, 3 = No Response
 Yes, what criteria are used to implement weather-related signal timing plan? (Check all that apply)
 Light precipitation **criteria_light**
 Heavy precipitation **criteria_heavy**
 Slick pavement (due to water, snow or ice) **criteria_slick**
 Low visibility (due to fog, wind-blown snow, dust, smoke, etc.) **criteria_low**
 Traffic volume **criteria_traffic**
 Time of day **criteria_time**
 Other (please specify): **criteria_othertext**
 No

AgencyName

Parking Management Capabilities

43. Does your agency deploy parking management systems that monitor the availability of parking?

- Yes **parking_management** 1 = Yes, 2 = No, 3 = No Response
 No

44. Does your agency disseminate parking availability information to drivers?

- Yes **parking_availability** 1 = Yes, 2 = No, 3 = No Response
 No

45. Does your agency use a parking pricing strategy (e.g., peak period surcharges) to manage congestion?

- Yes **parking_pricing** 1 = Yes, 2 = No, 3 = No Response
 No

Corridor Management

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

- Yes **identify_corridors** 1 = Yes, 2 = No, 3 = No Response

a. Please describe the corridor(s):

corridors_describe

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

corridors_coordinate

- No (GO TO QUESTION 48)

47. What type of services are currently coordinated across the corridor, and what type of services are envisioned for the future? (Check all that apply)

	Currently Coordinated	Future
Cross jurisdictional traffic signal coordination	serv_coord_traffic_signal_current	serv_coord_traffic_signal_future
Traffic incident management	serv_coord_incident_current	serv_coord_incident_future
Real-time transfer of performance information	serv_coord_perf_current	serv_coord_perf_future
Electronic toll tags used by other toll road	serv_coord_toll_tags_current	serv_coord_toll_tags_future
Traffic responsive signal timing	serv_coord_traffic_resp_current	serv_coord_traffic_resp_future
Ramp control	serv_coord_ramp_current	serv_coord_ramp_future
Inclement weather traffic control strategies, treatments, warnings, or road closures	serv_coord_weather_current	serv_coord_weather_future
Transit operations	serv_coord_transit_current	serv_coord_transit_future
Planned special events	serv_coord_events_current	serv_coord_events_future
Coordinate traffic signal operations with freeway congestion or value pricing	serv_coord_freeway_current	serv_coord_freeway_future
Other (please specify): serv_coord_other_text	serv_coord_other_current	serv_coord_other_future

Level of Integration

48. Does your agency provide arterial travel time, speed, and condition information in real-time (as these events occur) to the following types of agencies?

	Yes	No
Agencies involved in incident management	SendArterialInfoToIncident	1 = Yes, 2 = No, 3 = No Response
Freeway management agencies	SendArterialInfoToFreeway	1 = Yes, 2 = No, 3 = No Response
Arterial management agencies	SendArterialInfoToArterial	1 = Yes, 2 = No, 3 = No Response
Public transit agencies	SendArterialInfoToTransit	1 = Yes, 2 = No, 3 = No Response

Data Collection and Archiving

49. Does your agency archive any operational data?

- Yes `archive` 1 = Yes, 2 = No, 3 = No Response
 No (GO TO QUESTION 53)

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

- Traffic volume `archive_traffic_volumes`
 Traffic speeds `archive_traffic_speeds`
 Lane occupancy `archive_lane_occupancy`
 Vehicle classification `archive_vehicle_class`
 Travel time `archive_travel_time`
 Turning movements `archive_turning_movements`
 Road conditions (e.g., wet, icy, etc.) `archive_road_conditions`
 Emergency vehicle signal preemption `archive_emergency_preempti`
 Transit vehicle signal priority `archive_transit_priority`
 Queues `archive_queues`
 Phasing/cycle lengths `archive_phasing`
 Weather conditions (e.g., snow, fog, rain, etc.) `archive_weather_conditions`
 Incidents `archive_incidents`
 Other (please specify): `archive_otherText`
 None `archive_none`

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

- Route designations (snow emergency, etc.) `archive_elect_route`
 Current work zones `archive_elect_current_wz`
 Scheduled work zones `archive_elect_scheduled_wz`
 Intermodal (air, rail, water) connections `archive_elect_intermodal`
 Emergency/evacuation routes and procedures `archive_elect_emergency`
 Incident status `archive_elect_incident`
 Traffic video surveillance `archive_elect_traffic_video`
 Planned special events `archive_elect_planned`
 Other (please specify): `archive_elect_otherText`
 None `archive_elect_none`

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

- Traffic analysis archive_used_traffic_analysis
- Construction impact determination archive_used_construction
- Capital planning/analysis archive_used_capital
- Operation planning/analysis archive_used_operation
- Incident detection algorithm development archive_used_indicent
- Roadway impact analysis archive_used_roadway
- Accident prediction models archive_used_accident
- Dissemination to the public archive_used_dissemination
- Traffic management archive_used_traffic_mgt
- Measurement of performance archive_used_measurement
- Safety analysis archive_used_safety
- Traffic simulation modeling archive_used_traffic_sim
- Travel time prediction archive_used_travel
- Planned special events archive_used_planned
- Other (please specify): archive_used_otherText

ITS Funding

53. Does your agency have a separate budget for ITS? separate_its_budget 1 = Yes, 2 = No, 3 = No Response

- Yes, please indicate whether you track the budget separately for each of the following categories: (Check all that apply)
 - ITS Deployments separate_its_budget_deployments
 - ITS Operations and Maintenance separate_its_budget_operations
 - Traffic Management or Operations Center separate_its_budget_tmc
 - Other (please specify): separate_its_budget_otherText
 - Do not track categories separately separate_its_budget_do_not
- No

ITS Purchase Decisions

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

<i>Factor</i>	<i>Not at all Important</i>	<i>Not very Important</i>	<i>Neutral</i>	<i>Somewhat Important</i>	<i>Very Important</i>	
Price of equipment	Price_NotAtAll	Price_NotVery	Price_Neutral	Price_Somewhat	Price_Very	
Public/constituent's Involvement	Public_NotAtAll	Public_NotVery	Public_Neutral	Public_Somewh	Public_Very	
Funding/grant availability	Funding_NotAtAll	Funding_NotVery	Funding_Neutral	Funding_Somewhat	Funding_Very	
Mobility benefits (e.g., to address congestion)	Mobility_NotAtAll	Mobility_NotVery	Mobility_Neutral	Mobility_Somew	Mobility_Very	
Safety benefits	Safety_NotAtAll	Safety_NotVery	Safety_Neutral	Safety_Somewhat	Safety_Very	
Environmental benefits	Environmental_NotAtAll	Environmental_NotVery	Environmental_Neutral	Environmental_Somewhat	Environmental_Very	
Integration with other agencies	Int_agencies_NotAtAll	Int_agencies_NotVery	Int_agencies_Neutral	Int_agencies_Somewhat	Int_agencies_Very	
Integration with your current technologies	Int_tech_NotAtAll	Int_tech_NotVery	Int_tech_Neutral	Int_tech_Somewhat	Int_tech_Very	
Already used by other agencies	Already_NotAtAll	Already_NotVery	Already_Neutral	Already_Somewhat	Already_Very	
Other (please specify):	Other_Factor	Other_NotAtAll	Other_NotVery	Other_Neutral	Other_Somewhat	Other_Very

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

invest_its

1 = Yes, 2 = No, 3 = No Response

Yes (Check all that apply)

Invest in new ITS, please describe: invest_its_new

invest_its_describe

Expand current ITS coverage invest_its_expand

No

Benefits of Technologies

56. Based on your agency's experience, please rate the benefits of the following technologies:

Technology	No Benefit		Moderate Benefit		Major Benefit	No Experience
	1	2	3	4	5	
a. Sensors, loops	Sensors_loops_1	Sensors_loops_2	Sensors_loops_3	Sensors_loops_4	Sensors_loops_5	Sensors_loops_NA
b. Vehicle probes	Vehicle_Probes_1	Vehicle_Probes_2	Vehicle_Probes_3	Vehicle_Probes_4	Vehicle_Probes_5	Vehicle_Probes_NA
c. Adaptive traffic	Adaptive_Traffic_1	Adaptive_Traffic_2	Adaptive_Traffic_3	Adaptive_Traffic_4	Adaptive_Traffic_5	Adaptive_Traffic_NA
d. Cameras	Cameras_1	Cameras_2	Cameras_3	Cameras_4	Cameras_5	Cameras_NA
e. Lane management	Lane_Management_1	Lane_Management_2	Lane_Management_3	Lane_Management_4	Lane_Management_5	Lane_Management_NA
f. Traveler information	Traveler_Information_1	Traveler_Information_2	Traveler_Information_3	Traveler_Information_4	Traveler_Information_5	Traveler_Information_NA
g. Automated	Automated_Enforcement_1	Automated_Enforcement_2	Automated_Enforcement_3	Automated_Enforcement_4	Automated_Enforcement_5	Automated_Enforcement_NA
h. Archived data	Archived_Data_1	Archived_Data_2	Archived_Data_3	Archived_Data_4	Archived_Data_5	Archived_Data_NA

57. 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.)

additional_comments