Tracking the Deployment of the Integrated Metropolitan ITS Infrastructure in Charleston

FY99 Results

For additional information, please contact:

Joseph I. Peters, Ph.D.
ITS Program Assessment Coordinator
ITS Joint Program Office, Room 3416
400 Seventh St., S.W.
Washington, D.C. 20590
(202) 366-2202
FAX: (202) 493-2027
E-mail: joe.peters@fhwa.dot.gov

Table of Contents

Part 1 - Background and Purpose

In January 1996, Secretary Peña set a goal of deploying the integrated metropolitan Intelligent Transportation System (ITS) infrastructure in 75[1] of the nation's largest metropolitan areas by 2006:

> *"I'm setting a national goal: to build an intelligent transportation infrastructure across the United States to save time and lives, and improve the quality of life for Americans. I believe that what we do, we must measure . . . Let us set a very tangible target that will focus our attention . . . I want 75 of our largest metropolitan areas outfitted with a complete intelligent transportation infrastructure in 10 years."*[2]
>
> -- *Secretary Peña, 1996*

In 1997, the U.S. Department of Transportation initiated an effort to track progress toward fulfillment of this goal by conducting a survey of deployment in the nation's largest metropolitan areas. Traditionally, the product of a transportation infrastructure investment consists of a fixed asset such as a highway, bridge, or public transportation vehicle developed, constructed, or purchased by a single agency. Tracking the level of deployment for such traditional fixed assets can be accomplished by simply counting the number of such assets deployed. Measuring the deployment of the metropolitan ITS infrastructure is more complex because it consists of a set of systems, often deployed by multiple agencies, and integrated through a combination of complex institutional and technical arrangements. In brief, it is often difficult to simply count the number of systems deployed without first devising a measurement approach that captures the essential features of such systems in a consistent fashion across many deployment environments.

In order to track progress toward fulfillment of the Secretary's goal for deployment, the U.S. Department of Transportation ITS Joint Program Office developed the metropolitan ITS deployment tracking methodology. This methodology tracks deployment of the nine components that make up the Metropolitan ITS infrastructure: Freeway Management; Incident Management; Arterial Management; Emergency Management; Transit Management; Electronic Toll Collection; Electronic Fare Payment; Highway-Rail Intersections; and Regional Multimodal Traveler Information. Through a set of indicators tied to the major functions of each component, the level of deployment is tracked for the nation's largest metropolitan areas. In addition, the integration links between agencies operating the infrastructure are also tracked. The details of

[1] Since Secretary Peña's speech, the number of metropolitan areas that DOT will measure has been increased from 75 to 78. However, to maintain reporting consistency across the 10-year goal period, this report considers only the original 75 metropolitan areas.

[2] Excerpt of a speech delivered by Secretary of Transportation Peña at the Transportation Research Board in Washington, DC on January 10, 1996.

the methodology are explained elsewhere.[3]

During the summer and fall of 1999, the U.S. DOT undertook a new data collection effort for the purpose of examining ITS deployment progress in the nation's largest metropolitan areas. The Charleston metropolitan area was among the areas surveyed in 1997 and again in 1999. This report presents the results of the 1999 survey efforts and compares the results of the 1997 survey against those observed in 1999. The overall response rate for the surveys administered in the Charleston region was 73% in 1997 and 79% in 1999.

Part 2 contains a summary of the 1999 survey results, and Part 3 provides a comparison of 1999 survey results and the 1997 survey results.

The report also contains a set of appendices containing a map of the survey area, the list of local contacts surveyed along with a status of their response to the survey and a summary of the data collected from the surveys.

Agencies are encouraged to review the data presented in this report for completeness and accuracy and to direct any comments or corrections to the data provided to the contacts listed below:

Steve Gordon
Oak Ridge National Laboratory
P.O. Box 2008, 4500N, MS-6207
Oak Ridge, TN 37831-6207
(865) 576-8416 (voice)
(865) 574-3895 (fax)
gordonsr@ornl.gov

Jeff Trombly
Science Applications International Corporation
301 Laboratory Road
Oak Ridge, TN 37831-2501
(865) 481-8563 (voice)
(865) 481-2941 (fax)
jeffrey.w.trombly@saic.com

[3] Additional Resources: "Measuring ITS Deployment and Integration" (Electronic Document Number: 4372). U.S. Department of Transportation, Joint Program Office for Intelligent Transportation Systems, 400 Seventh St., SW (HVH-1), Washington, DC 20590, Phone: 202-366-9536, Fax: 202-366-3302, Web: http://www.its.dot.gov.

Part 2 - Summary 1999 Survey Results

Deployment indicators have been developed for two broad areas of interest: (1) the individual components, including their basic functions and characteristics and (2) integration of components, including how these components work together to provide coordinated regional service. As mentioned earlier, these indicators are expressed as percentages of the possible deployment opportunity and not necessarily what should be deployed based on local needs. Requirements for deployment and integration between each component will vary based on local conditions and cannot be assigned without extensive coordination with individual metropolitan areas.

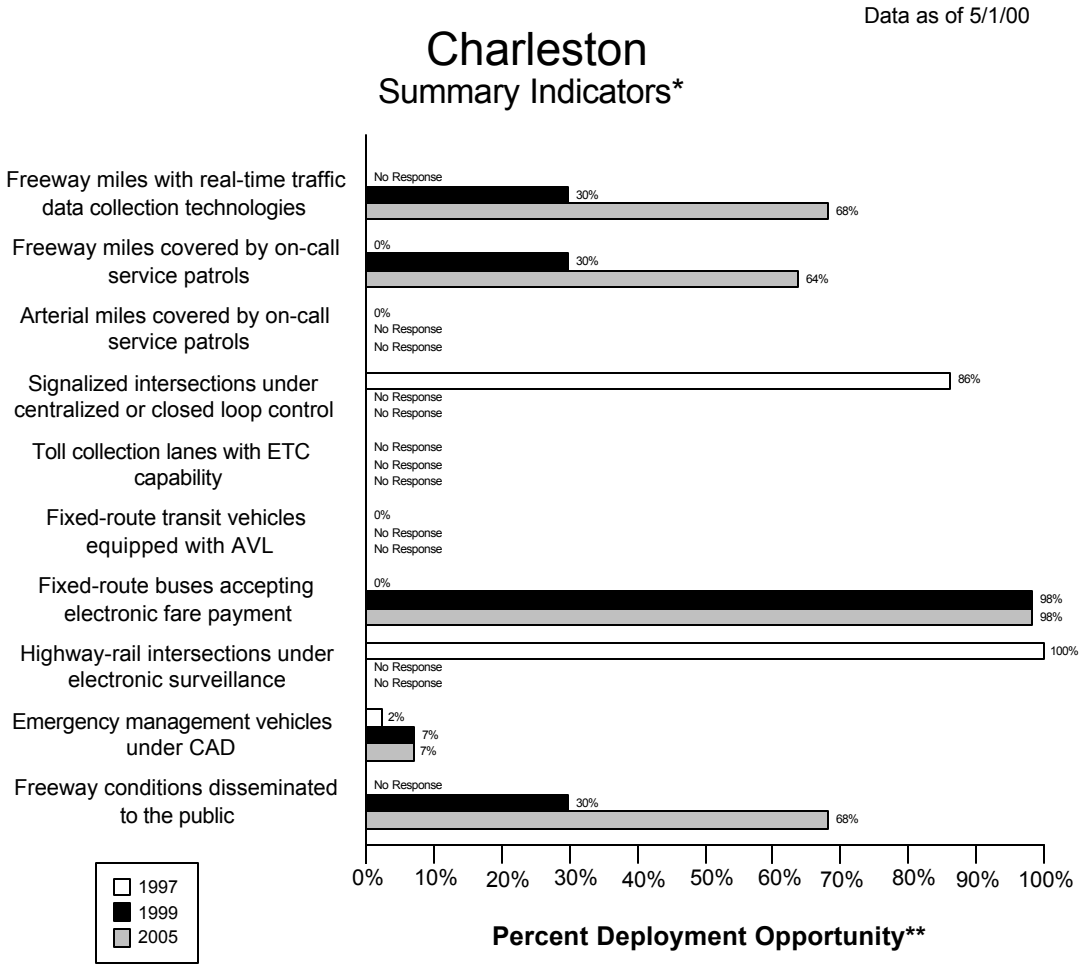
The following two figures portray the surrogate indicators for each of the nine components in Charleston and the same indicators at the national level. These are judged to be the single best representative of a component and are being used as summary indicator for component. The summary indicators are expressed as a percentage; however, because deployment goals have yet to be established, these indicators should not be read as a comparison of what is deployed versus eventual deployment goals. Instead, they only reflect what is deployed compared to full market saturation (i.e., opportunity for deployment).

Each component indicator was selected to reflect a critical function of the individual components. For example, in the case of Freeway Management, three basic functions were defined: surveillance, traffic control, and information display. The three indicators developed to reflect these functions are: percentage of freeway centerline miles under electronic surveillance (surveillance function), percentage of freeway entrance ramps managed by ramp meters (traffic control function), and percentage of freeway centerline miles covered by permanent VMS, HAR, or in-vehicle signing (information display function). The indicators are surrogates that do not necessarily reflect the full breadth of metropolitan ITS deployment activity.

A critical aspect of ITS that provides much of its capability is the integration of individual components to form a unified regional traffic control system. Individual ITS components routinely collect information that is used for purposes internal to that component. For example, the Arterial Management component monitors arterial conditions to revise signal timing and to convey these conditions to travelers through such technologies as variable message signs and highway advisory radio. Other ITS components can make use of this information in formulating their control strategies. For example, Transit Management may alter routes and schedules based on real-time information on arterial traffic conditions, and Freeway Management may alter ramp metering or diversion recommendations based on the same information.

As with the component indicators, definitions for inter- and intra-component integration were developed for each component, and indicators, derived from these definitions, were produced for each component. A total of 34 individual integration indicators was specified and is portrayed in the third figure which follows. Each integration indicator has been assigned a number and an origin/destination path from one ITS infrastructure component to another. For example, the

integration of information from the Freeway Management component to the Regional Multimodal Traveler Information component is identified by the number “10.”

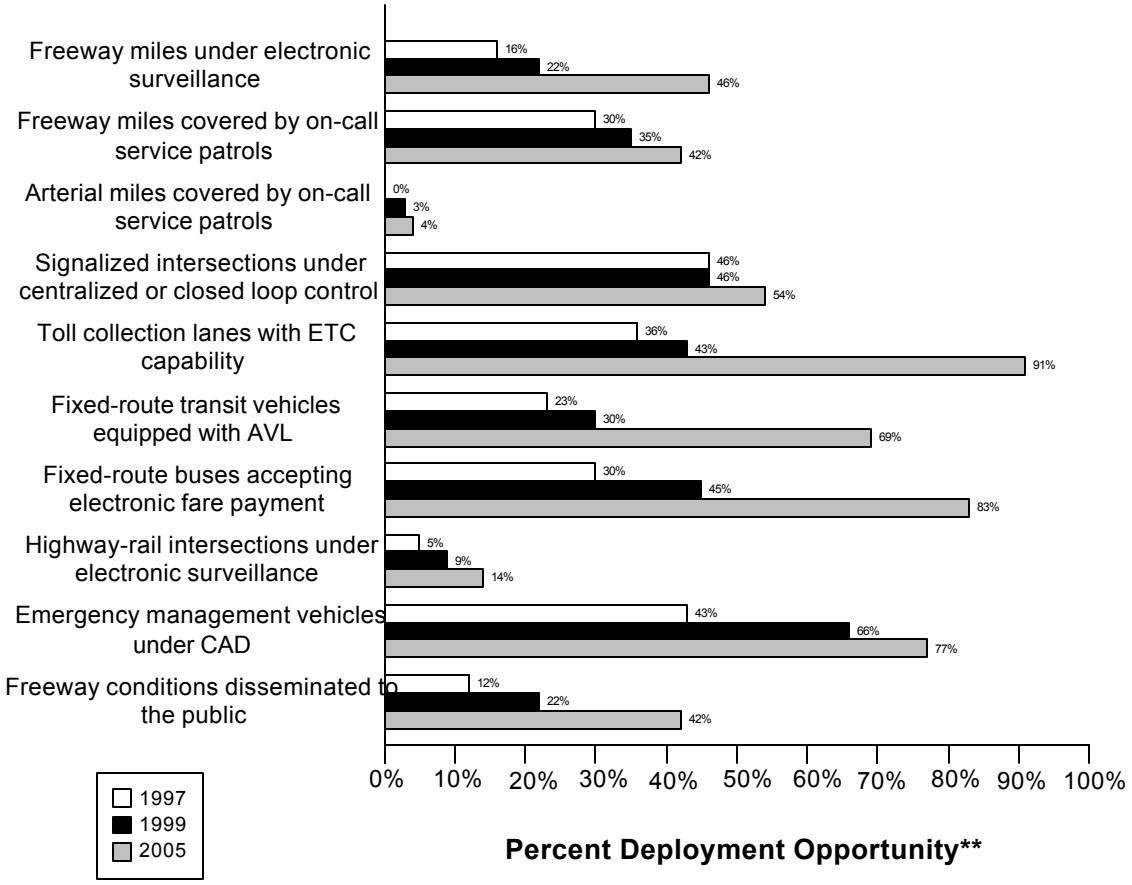


* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.
** Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

Data as of 5/1/00

National

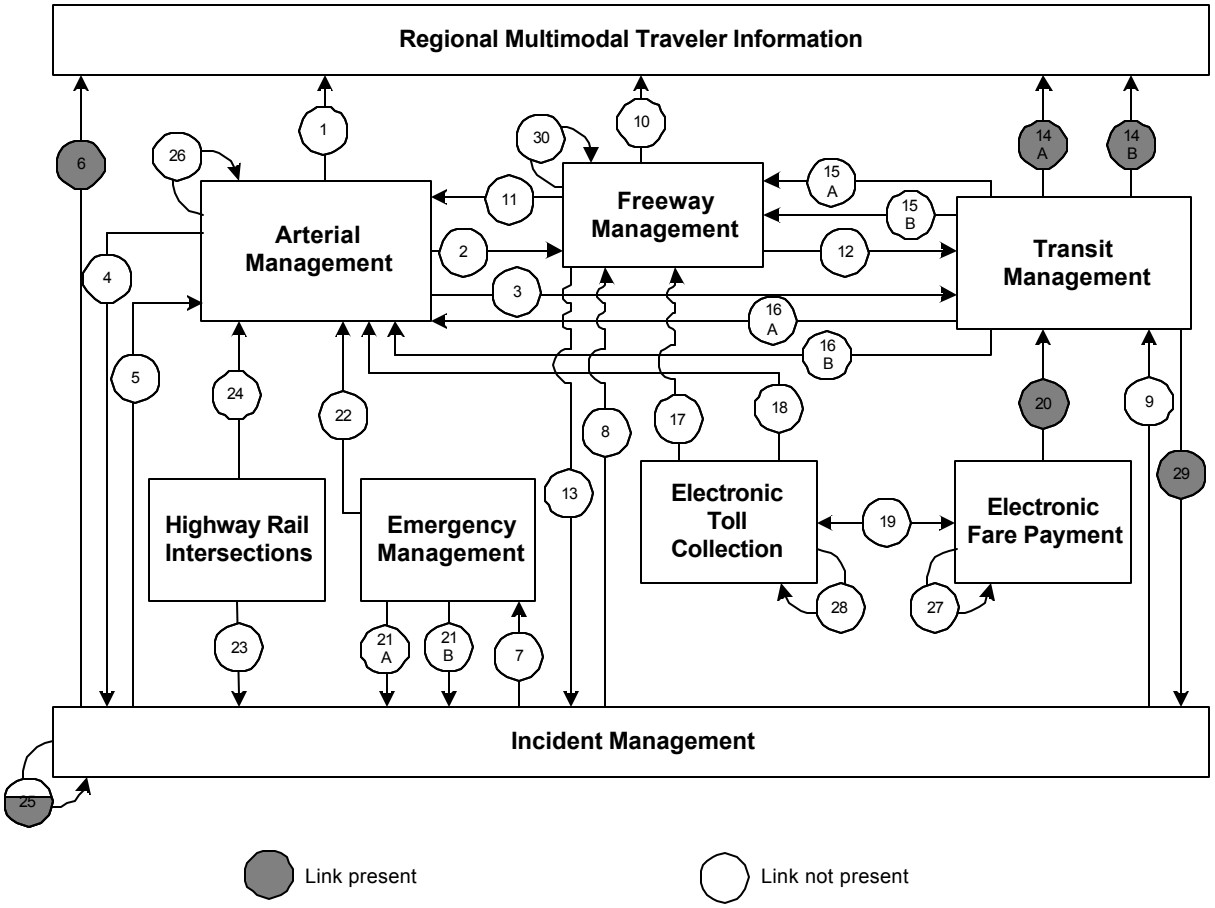
Summary Indicators*



* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity

** Deployment opportunity reflects potential totals that do not necessarily reflect actual need

Charleston Integration Links



Note: Shading indicates the value of the link. For example a circle half shaded equals 50%

Link	Description	Link	Description
1	Arterial Management to Regional Multimodal Traveler Information	2	Arterial Management to Freeway Management
3	Arterial Management to Transit Management	4	Arterial Management to Incident Management
5	Incident Management to Arterial Management	6	Incident Management to Regional Multimodal Traveler Information
7	Incident Management to Emergency Management.	8	Incident Management to Freeway Management
9	Incident Management to Transit Management	10	Freeway Management to Regional Multimodal Traveler Information
11	Freeway Management to Arterial Management	12	Freeway Management to Transit Management

Link	Description	Link	Description
13	Freeway Management to Incident Management	14a 14b	Transit Management to Regional Multimodal Traveler Information (static route information) Transit Management to Regional Multimodal Traveler Information (schedule adherence information)
15a 15b	Transit Management to Freeway Management Transit Management to Freeway Management (transit vehicle probes)	16a 16b	Transit Management to Arterial Management Transit Management to Arterial Management (transit vehicle probes)
17	Electronic Toll Collection to Freeway Management (ETC equipped probes)	18	Electronic Toll Collection to Arterial Management (ETC equipped probes)
19	Electronic Fare Payment and Electronic Toll Collection	20	Electronic Fare Payment to Transit Management
21a 21b	Emergency Management to Incident Management (incident notification) Emergency Management to Incident Management (incident clearance)	22	Emergency Management to Arterial Management
23	Highway-rail intersections to Incident Management (crossing status)	24	Highway-rail intersections to Arterial Management (crossing status)
25	Incident Management intra component	26	Arterial Management intra component
27	Electronic Fare Payment intra component.	28	Electronic Toll Collection intra component
29	Transit Management to Incident Management (incident reporting)	30	Freeway Management intra component

Part 3 - Detailed 1999 Survey Results

The following figures and tables summarize the complete set of component and integration indicators developed for the Charleston metropolitan area. The figures summarizing the component indicators consist of a bar chart portraying the deployment levels for 1997, 1999, and 2005 accompanied by detailed tables of the data used to calculate each component indicator value (*Num* stands for numerator and *Den* stands for denominator; blank space indicates that no response was received.)

Example: Calculating Component Indicators for Freeway Management

Consider a metropolitan area with 100 miles of freeway and 25 freeway entrance ramps. The area has no ramp meters, 10 freeway miles for which traffic data are collected electronically, and 5 freeway miles, which are covered by highway advisory radio.

The component indicator for electronic surveillance is calculated as (10/100) or 10%.

The component indicator for ramp meter control is calculated as (0/25) or 0%.

The component indicator for HAR coverage is calculated as (5/100) or 5%.

The summary indicator for the metropolitan area is calculated as (10%+0%+5%)/3 = 5%.

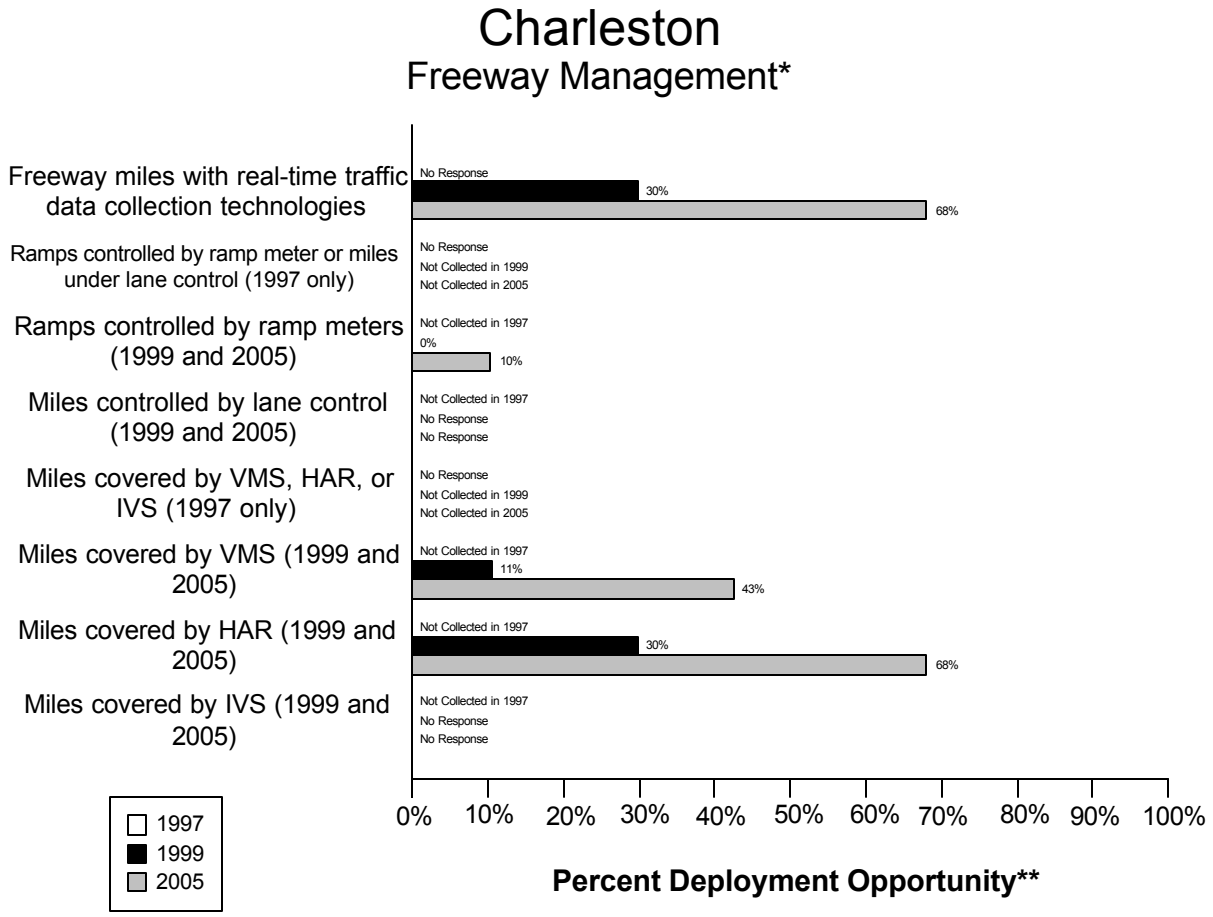
The figures summarizing the integration indicators consist of a diagram for each of the nine metropolitan ITS components portraying the integration level for 1999 (*italic*) and 2005 (**bold**), accompanied by tables providing an explanation of the data and calculations performed to develop each integration indicator value for 1999 and 2005. Each diagram portrays the proportion of agencies providing information to a component (e.g., the flow of incident information from Incident Management to Freeway Management) and the proportion of agencies providing information from one component to other components (e.g., the flow of freeway travel condition information from Freeway Management to Arterial Management).

Example: Calculating Integration between Arterial Management and Regional Multimodal Traveler Information

Consider a metropolitan area with three arterial management agencies. One out of three provides information to the public using a Regional Multimodal Traveler Information Media (e.g., internet, kiosk, pager, etc...). The integration indicator is 1/3 or 33%.

Freeway Management Component Indicators

Data as of 5/1/00



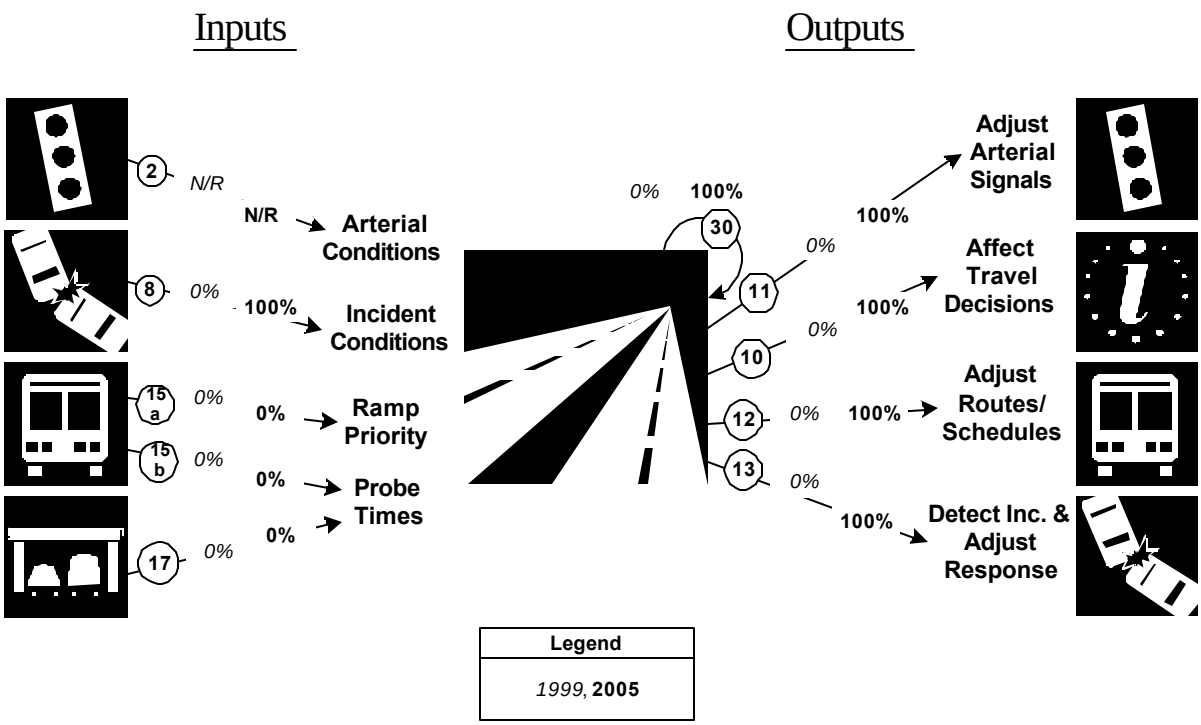
* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.
** Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

Description	1997			1999			2005		
	Num	Den	%	Num	Den	%	Num	Den	%
Freeway centerline miles are under electronic surveillance for monitoring traffic flow		47		14	47	30%	32	47	68%
Freeway entrance ramps are controlled by ramp meters or miles under lane control									

Description	1997			1999			2005		
	Num	Den	%	Num	Den	%	Num	Den	%
Freeway entrance ramps are controlled by ramp meters				0	48	0%	5	48	10%
Freeway centerline miles will be controlled by lane control					47			47	
Freeway miles are covered by VMS, HAR, or IVS		47							
Freeway miles are covered by VMS				5	47	11%	20	47	43%
Freeway miles are covered by HAR				14	47	30%	32	47	68%
Freeway miles are covered by IVS					47			47	

Freeway Management Integration Indicators

Charleston
Freeway Management Integration*



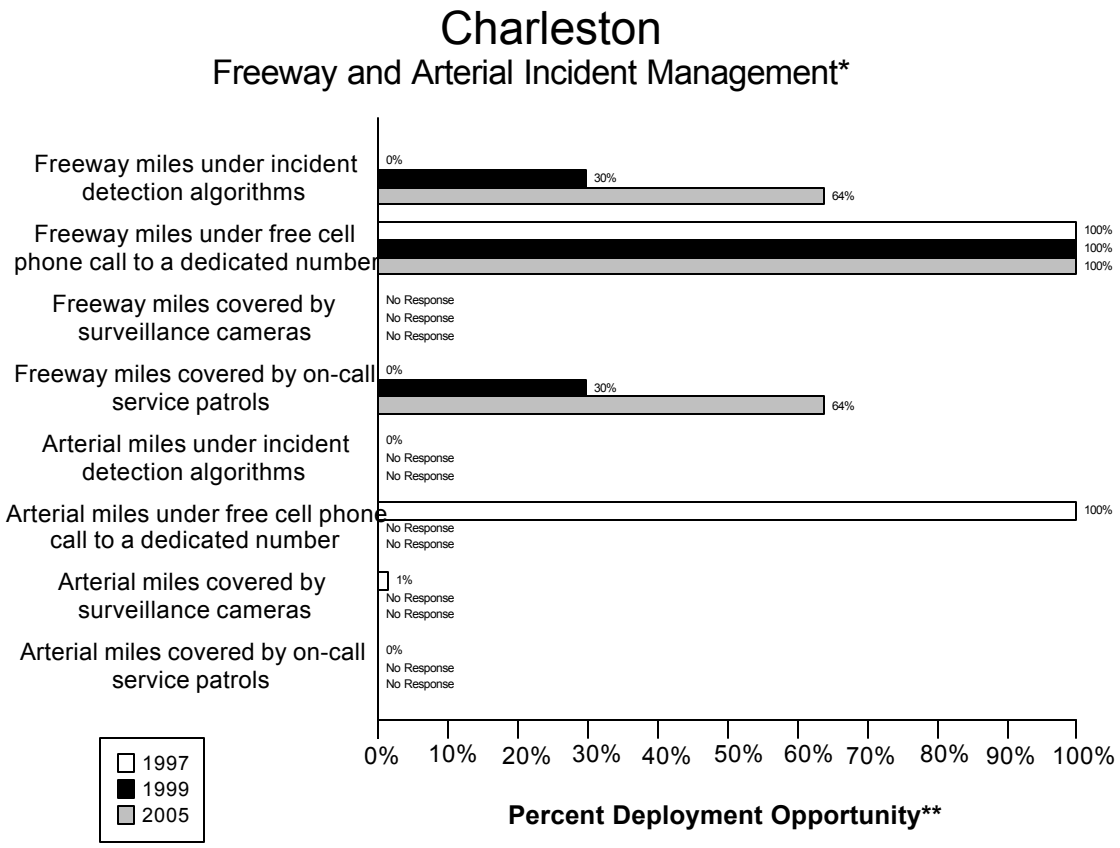
* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity

Link Description	1999	2005
2. Arterial Management agencies sending information to Freeway Management	(0/)	(0/)
8. Incident Management agencies sending information to Freeway Management	(0/ 1) 0%	(1/ 1) 100%
15a. Transit management agencies with vehicles equipped with ramp meter priority	(0/ 1) 0%	(0/ 1) 0%
15b. Transit Management agencies with vehicles equipped as probes	(0/ 1) 0%	(0/ 1) 0%
17. Freeway Management agencies receiving freeway conditions from vehicle probes	(0/ 1) 0%	(0/ 1) 0%
30. Freeway Management agencies sending information to another Freeway Management agency	(0/ 1) 0%	(1/ 1) 100%
11. Freeway Management agencies sending information to Arterial Management	(0/ 1) 0%	(1/ 1) 100%

Link Description	1999	2005
10. Freeway Management agencies disseminating freeway conditions to the public	(0/ 1) 0%	(1/ 1) 100%
12. Freeway Management agencies sending freeway conditions to Transit Management	(0/ 1) 0%	(1/ 1) 100%
13. Freeway Management agencies sending freeway conditions to Incident Management	(0/ 1) 0%	(1/ 1) 100%

Incident Management Component Indicators

Data as of 5/1/00



* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.
** Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

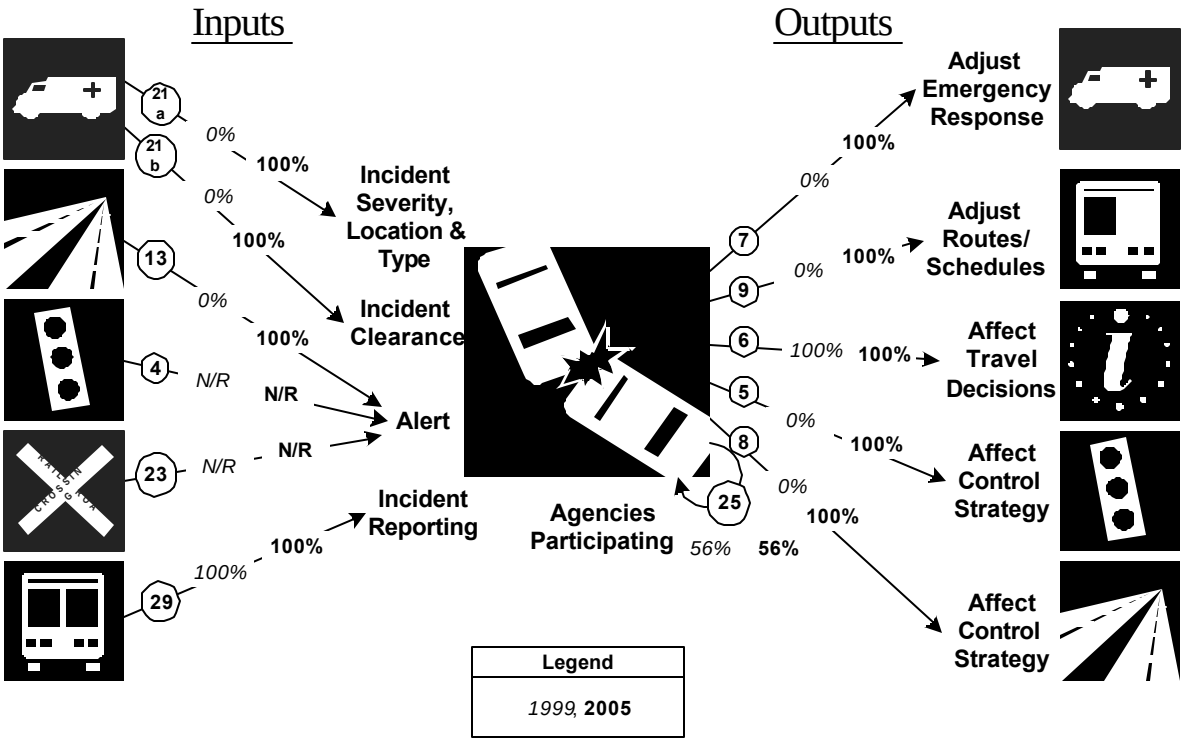
	1997			1999			2005		
Description	Num	Den	%	Num	Den	%	Num	Den	%
Freeway miles are covered by incident detection algorithms	0	47	0%	14	47	30%	30	47	64%
Freeway miles are covered by free cellular phone calls to a dedicated number	47	47	100%	47	47	100%	47	47	100%
Freeway miles are covered by surveillance cameras.		47			47			47	

Description	1997			1999			2005		
	Num	Den	%	Num	Den	%	Num	Den	%
Freeway miles are covered by on-call publicly-sponsored service patrol or towing services.	0	47	0%	14	47	30%	30	47	64%
Arterial miles are covered by incident detection algorithms	0	402	0%						
Arterial miles are covered by free cellular phone calls to a dedicated number	402	402	100%						
Arterial miles are covered by surveillance cameras	5	402	1%						
Arterial miles are covered by on-call publicly-sponsored service patrol or towing services	0	402	0%						

Incident Management Integration Indicators

Charleston

Incident Management Integration*



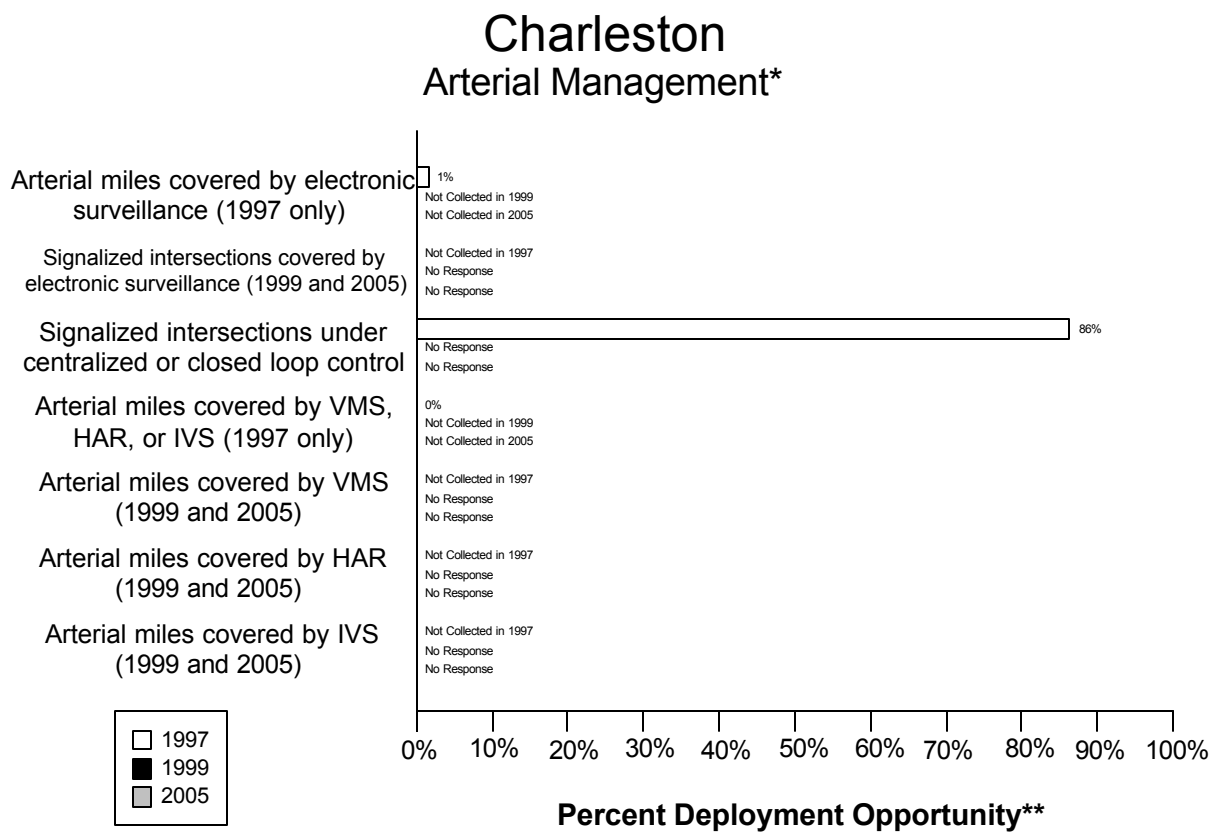
* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity

Link Description	1999	2005
21a. Incident management agencies receiving incident severity from Emergency Management	(0/ 1) 0%	(1/ 1) 100%
21b. Incident management agencies receiving incident clearance activities from Emergency Management	(0/ 1) 0%	(1/ 1) 100%
13. Freeway Management agencies sending freeway conditions to Incident Management	(0/ 1) 0%	(1/ 1) 100%
4. Arterial Management agencies sending arterial conditions to Incident Management	(0/)	(0/)
23. Arterial Management agencies receive information on highway-rail intersection crossing blockages for the purpose of managing incident response	(0/)	(0/)
29. Transit Management agencies report traffic incidents as part of an organized regional incident management program	(1/ 1) 100%	(1/ 1) 100%

Link Description	1999	2005
7. Incident management agencies transfer information describing incident severity, location, and type to Emergency Management agencies	(0/ 1) 0%	(1/ 1) 100%
9. Incident Management agencies transfer information describing incident severity, location, and type to Transit Management agencies	(0/ 1) 0%	(1/ 1) 100%
6. Incident Management agencies disseminate information describing incident severity, location, and type to the public	(1/ 1) 100%	(1/ 1) 100%
5. Incident Management agencies transfer information describing incident severity, location, and type to Arterial Management agencies	(0/ 1) 0%	(1/ 1) 100%
8. Incident Management agencies transfer information describing incident severity, location, and type to Freeway Management agencies	(0/ 1) 0%	(1/ 1) 100%
25. Police, fire, and EMS agencies participating in a formal incident management plan/team	(5/ 9) 56%	(5/ 9) 56%

Arterial Management Component Indicators

Data as of 5/1/00



* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.
** Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

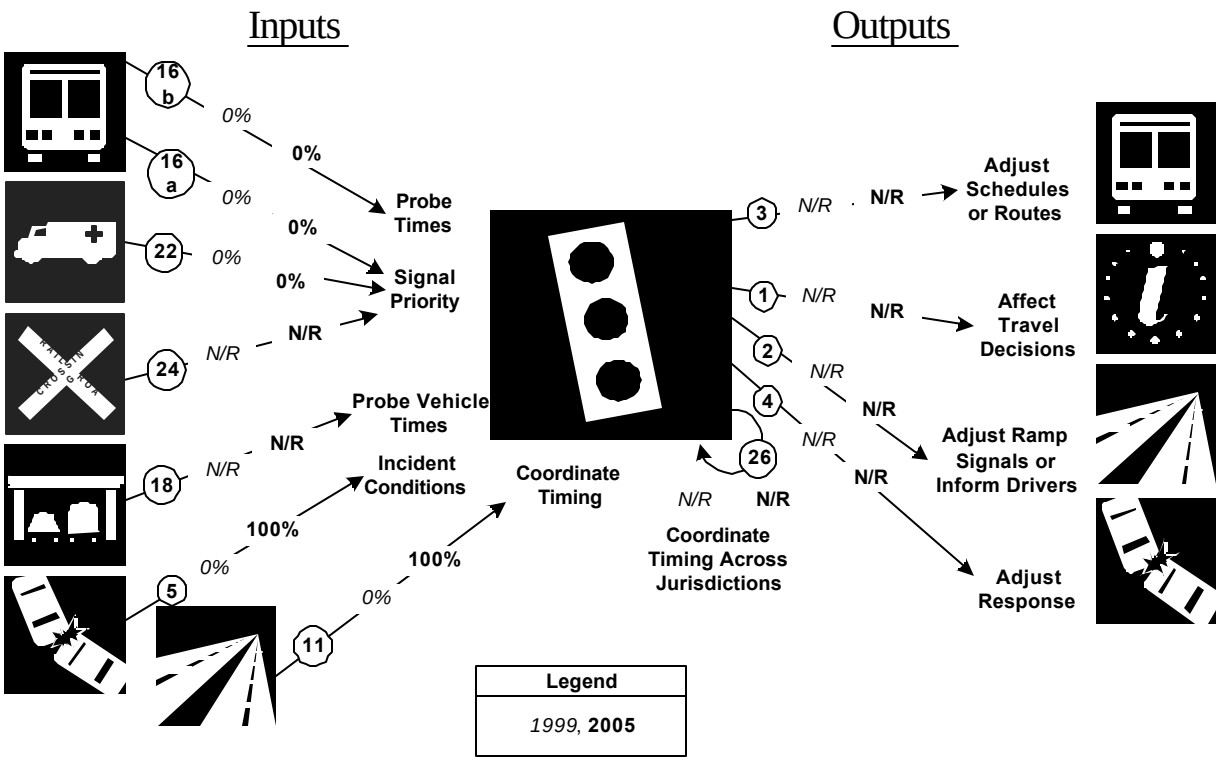
Description	1997			1999			2005		
	Num	Den	%	Num	Den	%	Num	Den	%
Arterial miles covered by electronic surveillance	6	402	1%						
Signalized intersections are covered by electronic surveillance for monitoring traffic flow									
Signalized intersections are under centralized or closed loop control	233	270	86%						

Description	1997			1999			2005		
	Num	Den	%	Num	Den	%	Num	Den	%
Arterial miles are covered by VMS, HAR, or IVS	0	402	0%						
Arterial miles are covered by VMS									
Arterial miles are covered by HAR									
Arterial miles are covered by IVS									

Arterial Management Integration Indicators

Charleston

Arterial Management Integration*



* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity

Link Description	1999	2005
16a. Transit management agencies with vehicles equipped with traffic signal priority	(0/ 1) 0%	(0/ 1) 0%
16b. Transit Management agencies have vehicles equipped as probes on arterials	(0/ 1) 0%	(0/ 1) 0%
22. Emergency Management agencies have vehicles equipped with traffic signal preemption capability	(0/ 9) 0%	(0/ 9) 0%
24. Arterial Management agencies have traffic signals within 200 feet of a highway rail intersection with the capability of having their signal timing adjusted in response to a train crossing	(0/)	(0/)
18. Number of Arterial Management agencies receiving information from vehicle probes	(0/)	(0/)
5. Incident Management agencies transfer information describing incident severity, location, and type to Arterial Management	(0/ 1) 0%	(1/ 1) 100%

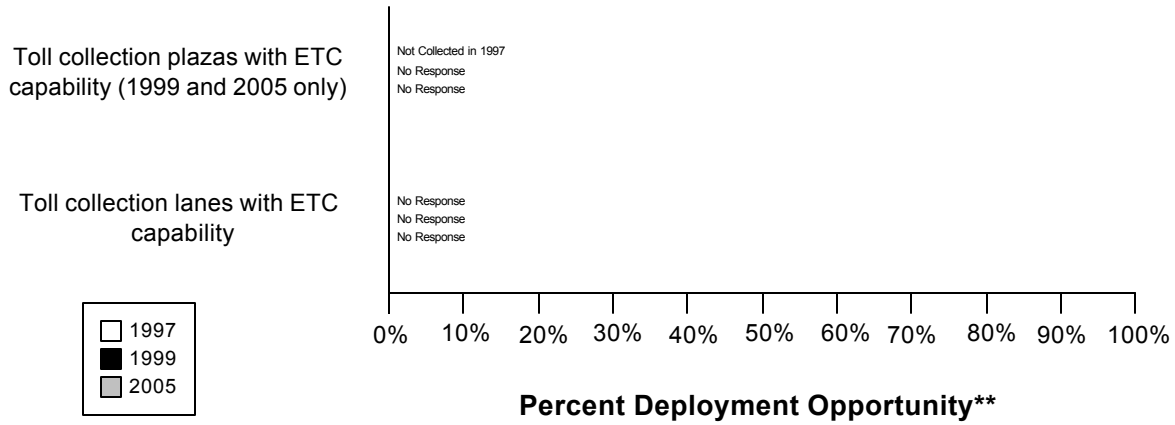
Link Description	1999	2005
11. Freeway Management agencies transfer freeway travel times, speeds, and conditions to Arterial Management agencies	(0/ 1) 0%	(1/ 1) 100%
3. Arterial Management agencies transfer arterial travel times, speeds, and conditions to Transit Management	(0/)	(0/)
1. Arterial Management agencies disseminate arterial travel times, speeds, and conditions to the public	(0/)	(0/)
2. Arterial Management agencies send traffic condition information to Freeway Management	(0/)	(0/)
4. Arterial Management agencies transfer arterial travel times, speeds, and conditions to Incident Management	(0/)	(0/)
26. Arterial Management agencies under cooperative agreement to share traffic signal timing for coordinated response	(0/)	(0/)

Electronic Toll Collection Component Indicators

Data as of 5/1/00

Charleston

Electronic Toll Collection*

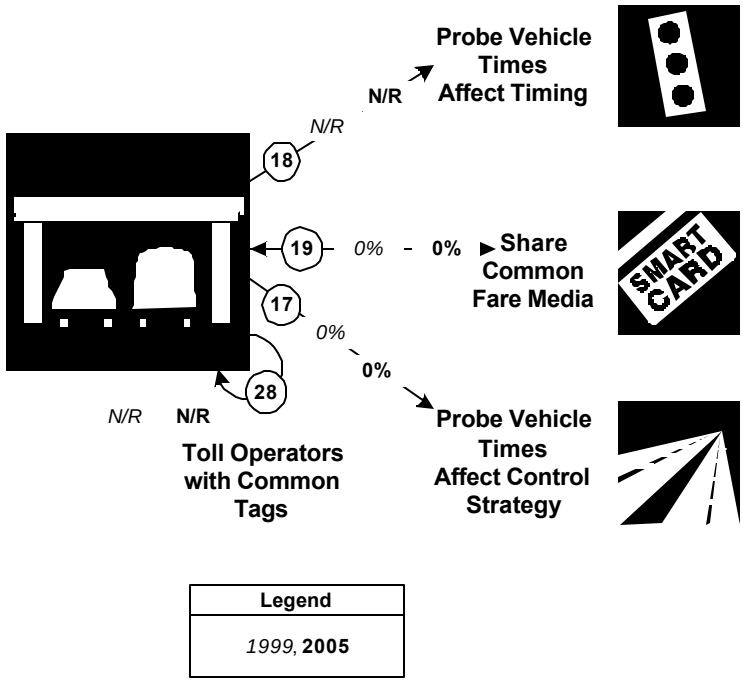


* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.
** Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

Description	1997			1999			2005		
	Num	Den	%	Num	Den	%	Num	Den	%
Toll collection plazas with ETC capability									
Toll collection lanes with ETC capability									

Electronic Toll Collection Integration Indicators

Charleston
Electronic Toll Collection Integration*

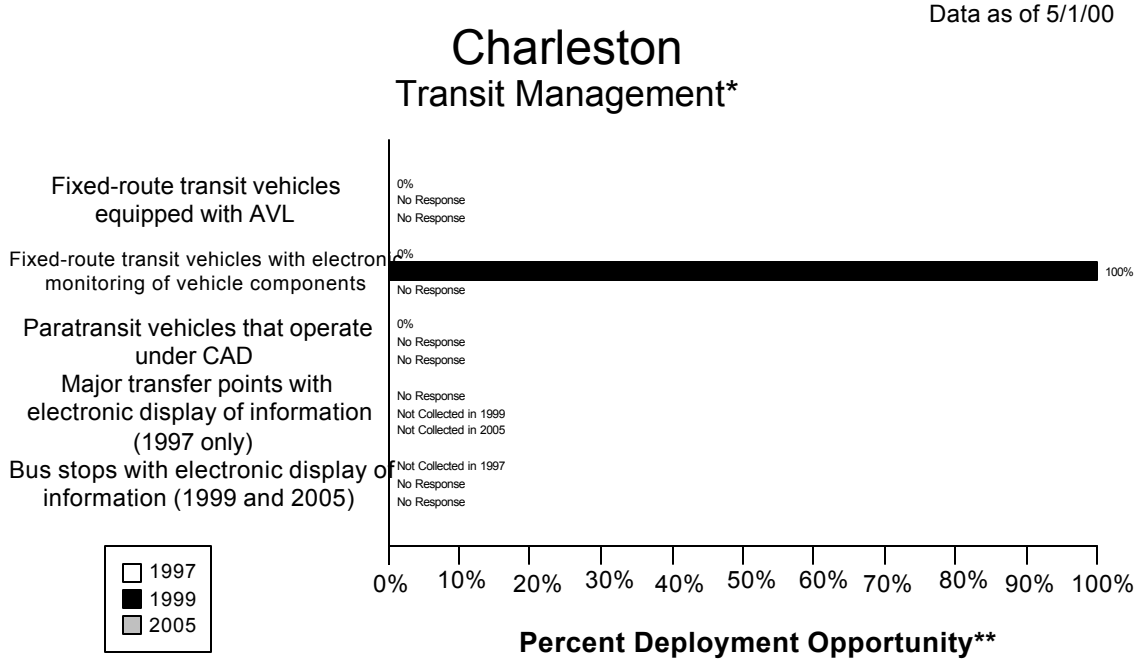


* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity

Link Description	1999	2005
18. Number of Arterial Management agencies receiving information from vehicle probes	(0/)	(0/)
19. Transit agencies that accept electronic payment through the use of electronic toll collection media	(0/ 1) 0%	(0/ 1) 0%
17. Freeway Management agencies receiving information from vehicle probes	(0/ 1) 0%	(0/ 1) 0%
28. Toll operators using common toll tag technology	(0/)	(0/)

Transit Management Component Indicators

Data as of 5/1/00

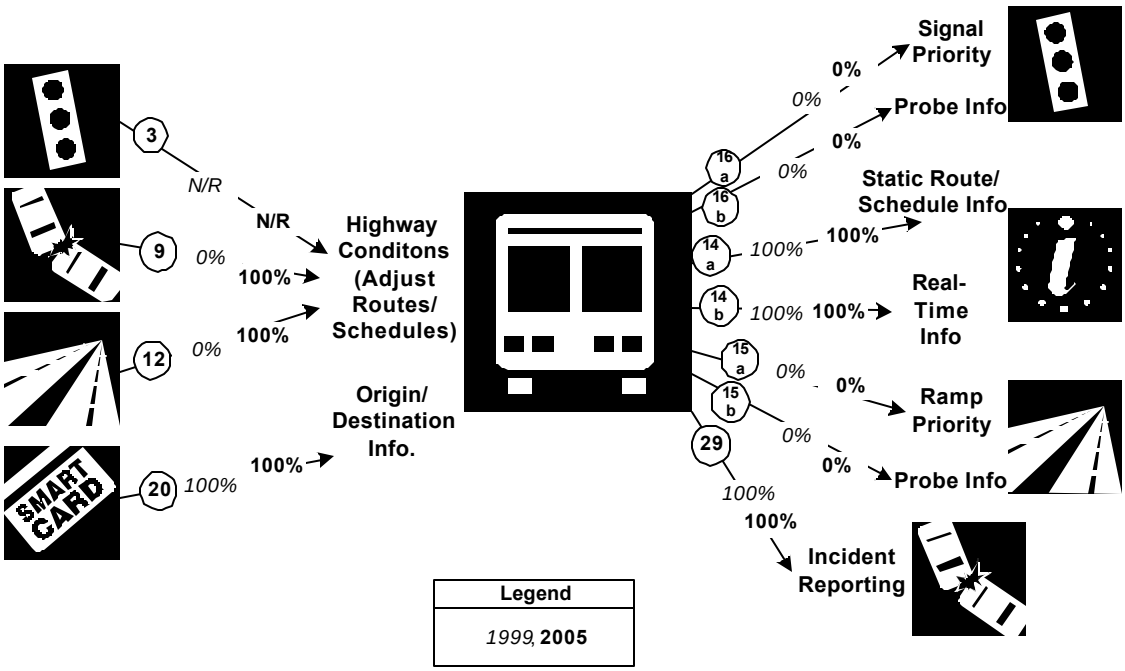


* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.
** Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

	1997			1999			2005		
Description	Num	Den	%	Num	Den	%	Num	Den	%
Fixed-route transit vehicles are equipped with AVL	0	52	0%		59				
Fixed-route transit vehicles are equipped with electronic monitoring of vehicle component	0	52	0%	59	59	100%	59		
Paratransit vehicles operate under computer-aided dispatch	0	13	0%		17				
Percent fixed-route transfer locations with electronic display of information	0	0							
Bus stops display information to the public					1000			1000	

Transit Management Integration Indicators

Charleston
Transit Management Integration*



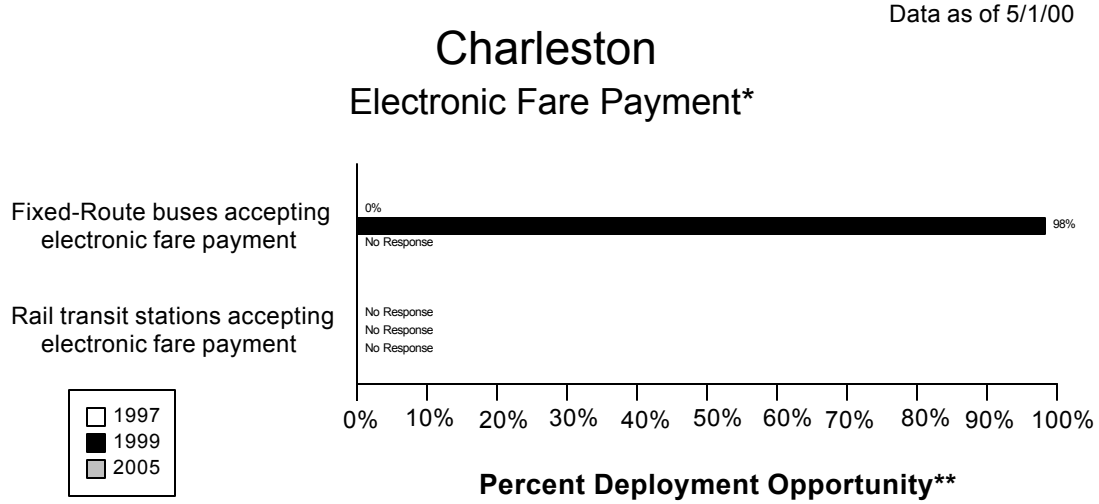
* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity

Link Description	1999	2005
3. Arterial Management agencies transfer arterial travel times, speeds, and conditions to Transit Management	(0/)	(0/)
9. Incident management agencies transfer information describing incident severity, location, and type to Transit Management	(0/ 1) 0%	(1/ 1) 100%
12. Freeway Management agencies transfer freeway travel times, speeds, and conditions to Transit Management	(0/ 1) 0%	(1/ 1) 100%
20. Transit Management agencies using Electronic Fare Payment data in transit service planning	(1/ 1) 100%	(1/ 1) 100%
16a. Transit Management agencies have vehicles equipped with traffic signal priority capability	(0/ 1) 0%	(0/ 1) 0%
16b. Transit Management agencies have vehicles equipped as probes on arterials	(0/ 1) 0%	(0/ 1) 0%
14a. Transit Management agencies disseminate information describing transit routes, schedules, and fares to travelers	(1/ 1) 100%	(1/ 1) 100%

Link Description	1999	2005
14b. Transit Management agencies disseminate information describing schedule/route adherence to travelers	(1/ 1) 100%	(1/ 1) 100%
15a. Transit Management agencies have vehicles equipped with ramp meter priority capability	(0/ 1) 0%	(0/ 1) 0%
15b. Transit Management agencies have vehicles equipped as probes on freeways	(0/ 1) 0%	(0/ 1) 0%
29. Transit Management agencies that report traffic incidents as part of an organized regional Incident Management program	(1/ 1) 100%	(1/ 1) 100%

Electronic Fare Payment Component Indicators

Data as of 5/1/00



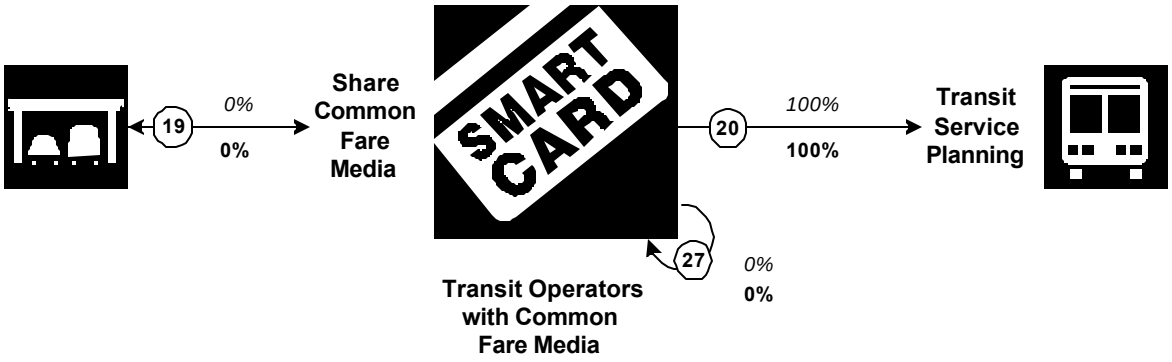
* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.
** Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

Description	1997			1999			2005		
	Num	Den	%	Num	Den	%	Num	Den	%
Fixed-route transit vehicles that accept electronic payment	0	52	0%	58	59	98%	58		
Rail transit stations that accept electronic payment	0	0							

Electronic Fare Payment Integration Indicators

Charleston
Electronic Fare Payment Integration*

Inputs Outputs



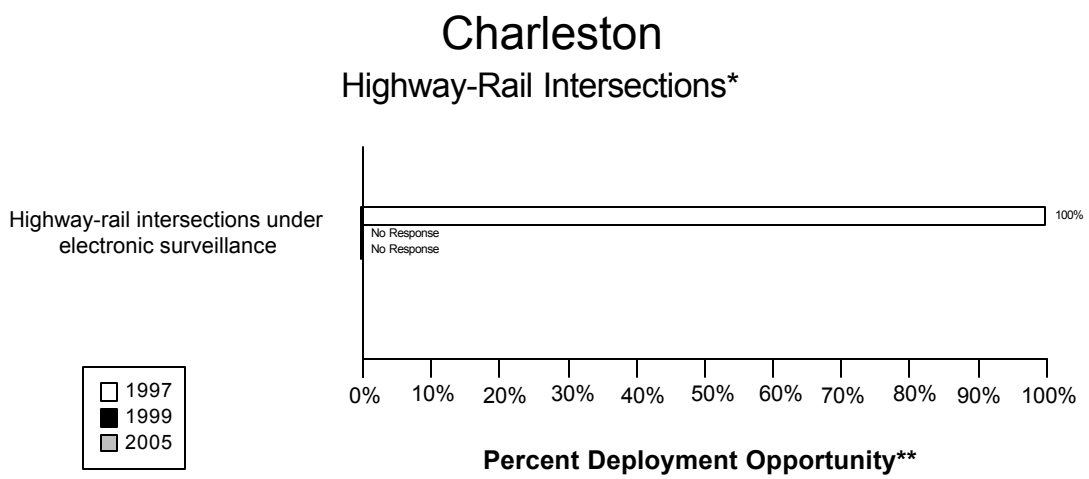
Legend
1999
2005

* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity

Link Description	1999	2005
19. Transit agencies that accept electronic payment through the use of electronic toll collection media	(0/ 1) 0%	(0/ 1) 0%
20. Transit Management agencies use Electronic Fare Payment data in transit service planning	(1/ 1) 100%	(1/ 1) 100%
27. Transit Management agencies that use the same electronic payment system	(0/ 1) 0%	(0/ 1) 0%

Highway Rail Intersection Component Indicators

Data as of 5/1/00



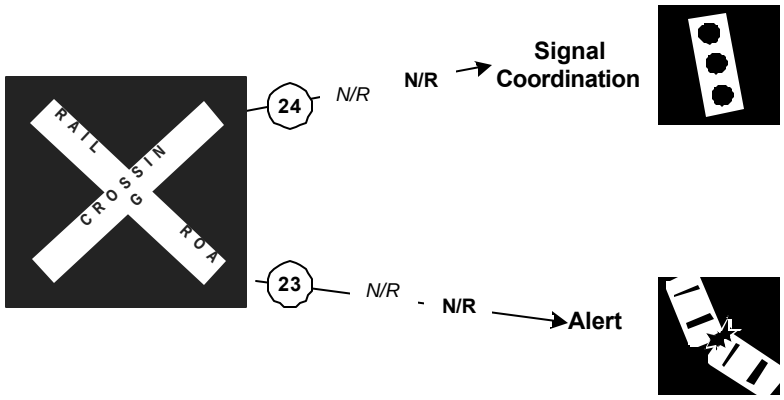
* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.
** Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

Description	1997			1999			2005		
	Num	Den	%	Num	Den	%	Num	Den	%
Highway-rail intersections are under electronic surveillance	1	1	100%						

Highway Rail Intersection Integration Indicators

Charleston
Highway Rail Intersections Integration*

Inputs Outputs



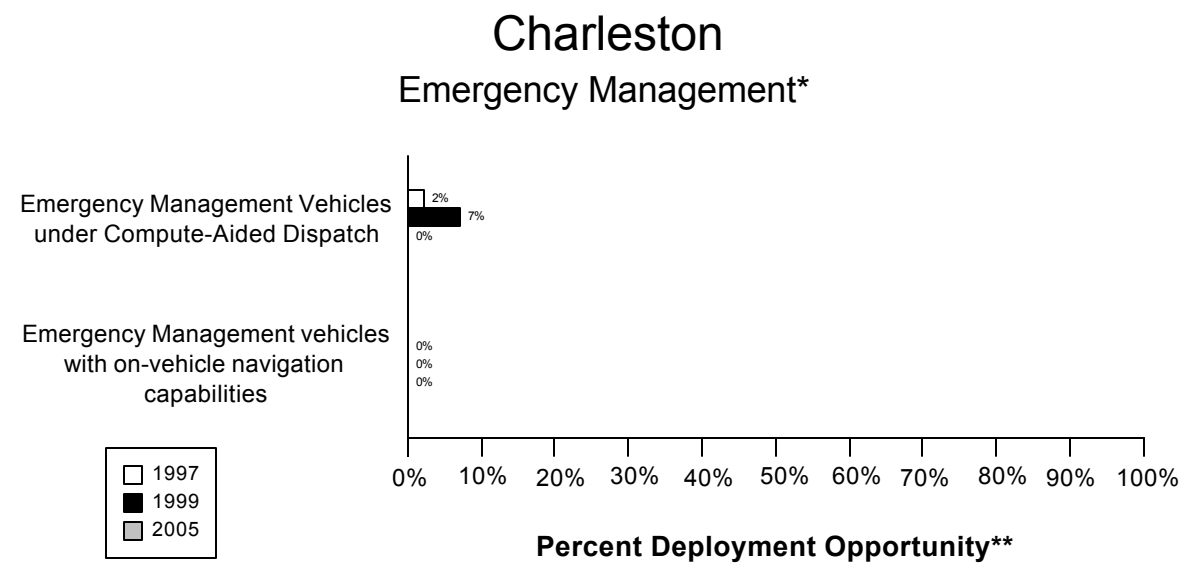
Legend
1999, **2005**

* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity

Link Description	1999	2005
24. Arterial Management agencies with traffic signals within 200 feet of a highway rail intersection with the capability of having their signal timing adjusted in response to a train crossing	(0/)	(0/)
23. Arterial Management agencies receive information on highway-rail intersection crossing blockages for the purpose of managing incident response	(0/)	(0/)

Emergency Management Component Indicators

Data as of 5/1/00

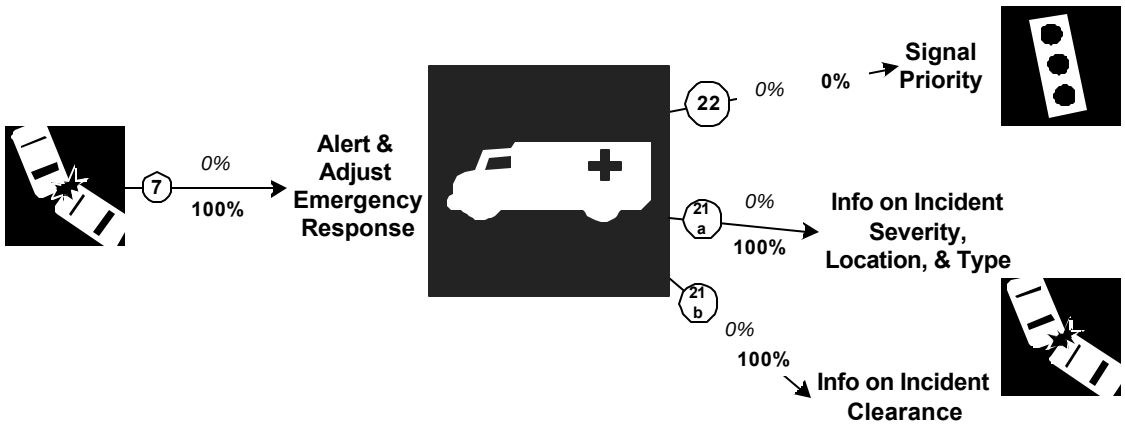


* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.
** Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

	1997			1999			2005		
Description	Num	Den	%	Num	Den	%	Num	Den	%
Public sector emergency vehicles that operate under computer-aided dispatch	23	1084	2%	60	860	7%	0	372	0%
Public sector emergency vehicles that have in-vehicle route guidance capability	0	1084	0%	0	860	0%	0	372	0%

Emergency Management Integration Indicators

Charleston
Emergency Management Integration*



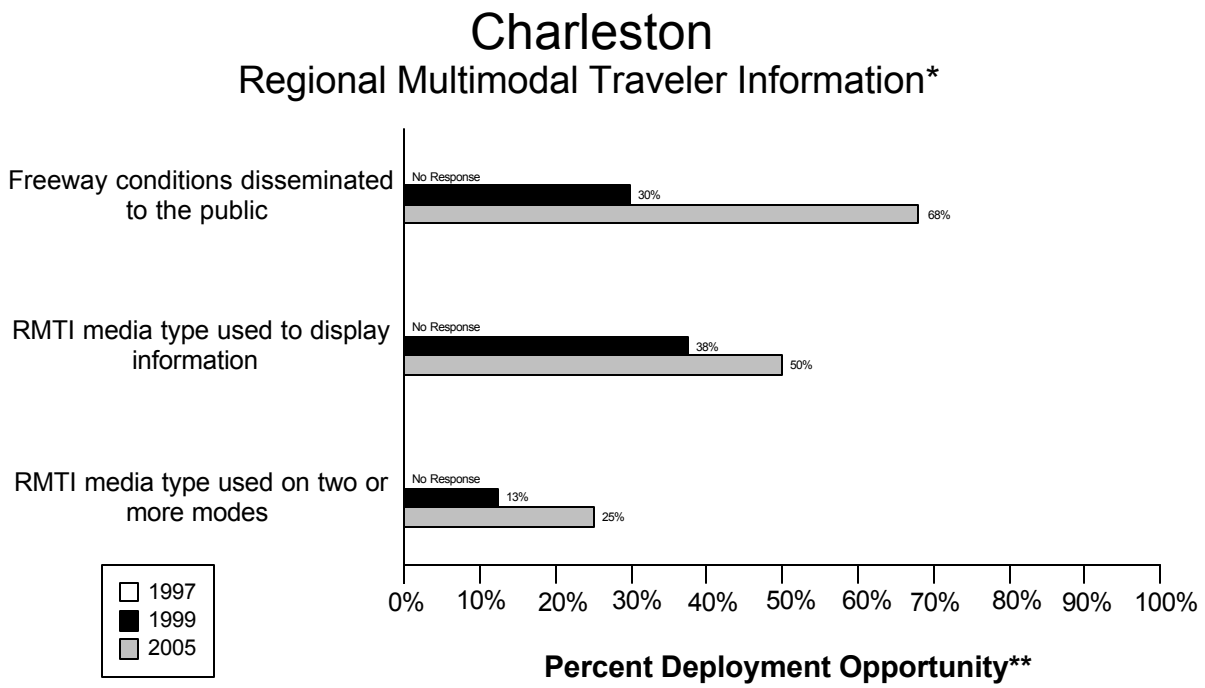
Legend
1999, **2005**

* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity

Link Description	1999	2005
7. Freeway Management agencies transfer information describing incident severity, location, and type to Emergency Management agencies	(0/ 1) 0%	(1/ 1) 100%
22. Emergency Management agencies have vehicles equipped with traffic signal preemption capability	(0/ 9) 0%	(0/ 9) 0%
21a. Freeway Management agencies receive incident severity, location, and type data from Emergency Management agencies	(0/ 1) 0%	(1/ 1) 100%
21b. Freeway Management agencies receive incident clearance activities information from Emergency Management agencies	(0/ 1) 0%	(1/ 1) 100%

Regional Multimodal Traveler Information Component Indicators

Data as of 5/1/00

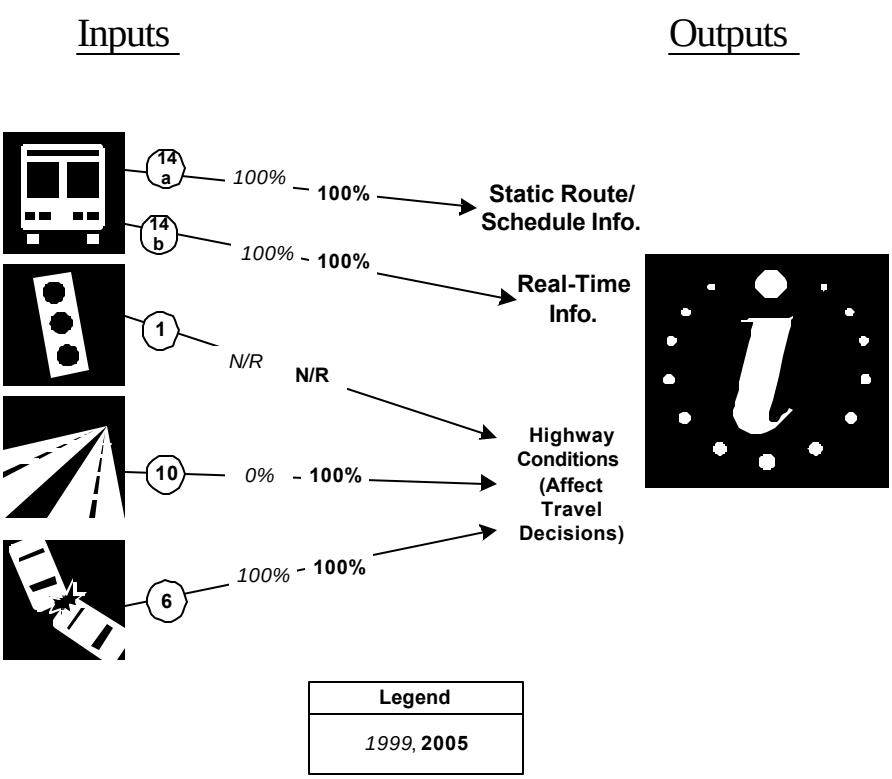


* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.
** Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

	1997			1999			2005		
Description	Num	Den	%	Num	Den	%	Num	Den	%
Freeway conditions disseminated to travelers		47		14	47	30%	32	47	68%
Possible RMTI media types are used to display information to travelers				3	8	38%	4	8	50%
Possible RMTI media are used to display information on *two or more modes* to travelers				1	8	13%	2	8	25%

Regional Multimodal Traveler Information Integration Indicators

Charleston
Regional Multimodal Traveler Information Integration*

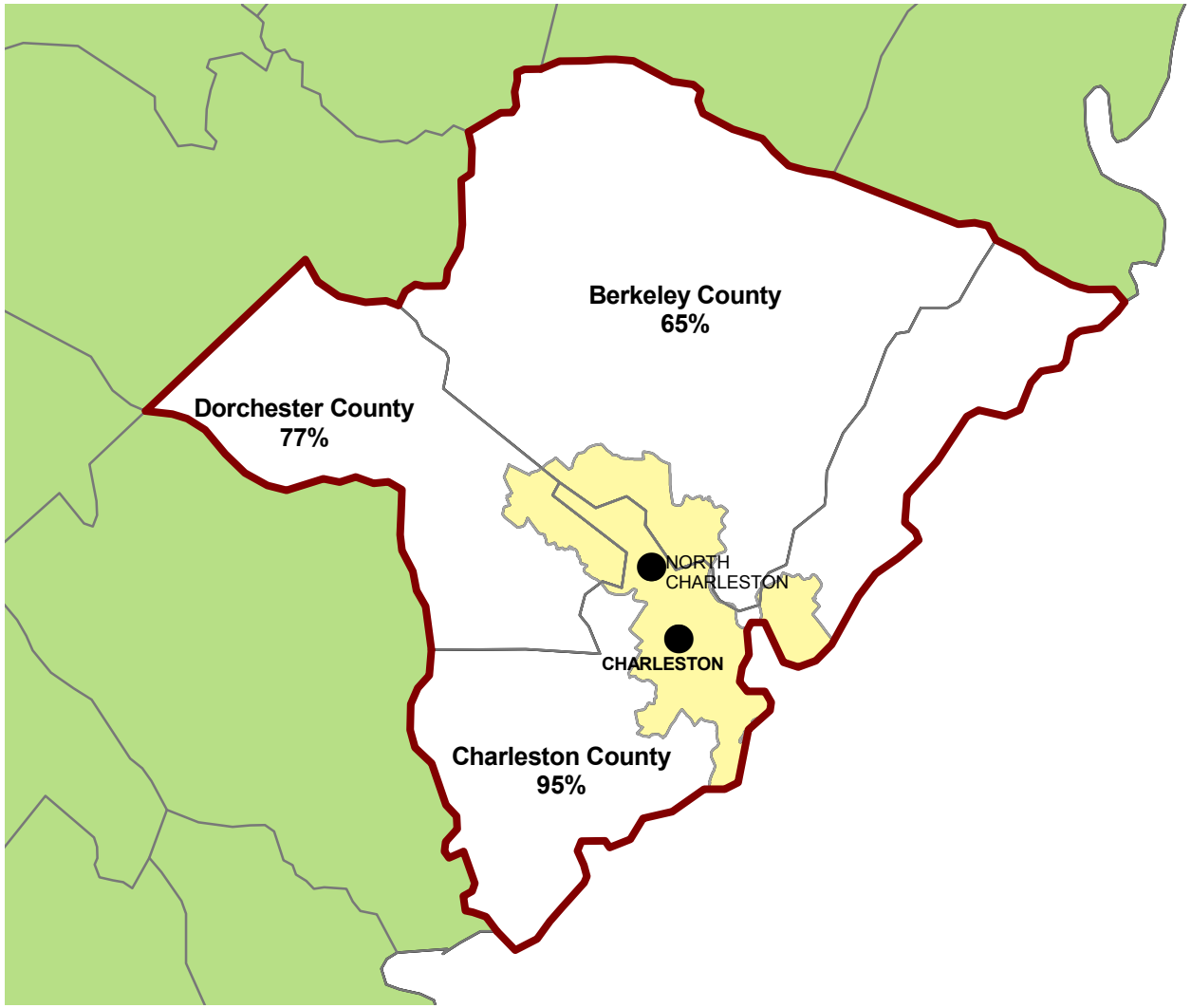


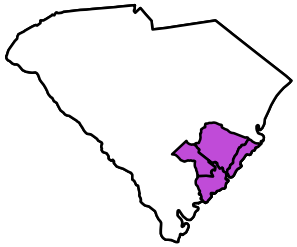
* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity

Link Description	1999	2005
14a. Transit Management agencies that disseminate information describing transit routes, schedules, and fares to travelers	(1/ 1) 100%	(1/ 1) 100%
14b. Transit Management agencies that disseminate information describing schedule/route adherence to travelers	(1/ 1) 100%	(1/ 1) 100%
1. Arterial Management agencies that disseminate arterial travel times, speeds, and conditions to the public	(0/)	(0/)
10. Freeway Management agencies that disseminate freeway travel times, speeds, and conditions to travelers	(0/ 1) 0%	(1/ 1) 100%
6. Incident Management agencies that disseminate information describing incident severity, location, and type to the public	(1/ 1) 100%	(1/ 1) 100%

Appendix A
Survey Coverage Area

CHARLESTON AREA TRANSPORTATION STUDY POLICY COMMITTEE, SC





City Included in Surveys

Metropolitan Planning Area Boundary

County Boundary

Urbanlized Area

Outside Survey Area

Percentage on the Map Represents Percentage of County Population Included within MPO Boundary

Appendix B
Surveyed Agencies

Surveyed Agencies

Agency Name	Phone	Fax	1999		1997	
			Out	In	Out	In
CHARLESTON						
Arterial Management						
South Carolina Department of Transportation	(843) 740-1665	(843) 740-1663	7/29/1999		10/15/1997	
Charleston City	(843) 724-7368	(843) 722-5956	7/29/1999		08/14/1997	10/06/1997
North Charleston City	(843) 745-1026	(843) 745-1099	7/30/1999		10/15/1997	
Emergency Management						
North Charleston City Fire Department	843- 745-1011	843-745-1002	6/2/1999	8/27/1999	10/16/1997	10/16/1997
Dorchester County Sheriff	843-832-0350	843-832-0308	6/2/1999	6/7/1999	07/13/1998	07/13/1998
North Charleston City Police Department	843-740-2875	843-745-1085	6/2/1999	8/25/1999	10/15/1997	10/15/1997
Berkeley County Sheriff Department	843-577-9562	843- 719-4426	6/2/1999	8/26/1999	10/15/1997	10/15/1997
Charleston City Police Department	843-720-2401	843-722-4085	7/27/1999	7/30/1999	08/14/1997	09/09/1997
Berkeley County Emergency Preparedness	(843) 719-4168	(843) 719-4111	6/2/1999	6/3/1999	10/15/1997	10/15/1997
Charleston City Fire Department	843-720-1981	843-720-3991	7/27/1999	7/30/1999	08/14/1997	09/09/1997
Charleston County Sheriff Office	(803) 529-7434	(803) 529-7433	6/2/1999	6/14/1999	10/15/1997	10/15/1997
Dorchester County Emergency Medical Services	843-832-0341	843-832-0343	6/2/1999	6/4/1999	10/15/1997	10/16/1997
Freeway Management						
South Carolina Department of Transportation	(803) 737-1455	(803) 737-0271	7/29/1999	8/23/1999	10/15/1997	
MPO						
Berkley County District Council of Governments	(843) 529-0400	(843) 529-0305	7/15/1999	9/2/1999		
Transit Management						
Charleston Transit Administration	(843) 720-3912	(843) 720-1985	8/9/1999	9/7/1999	07/21/1997	08/08/1997

Appendix C
Freeway Management Components

Freeway Management
Agencies for Metropolitan Area: Charleston

	South Carolina Department of Transportation	
	1999	**2005**
Agency Returned Survey?	Yes	
FREEWAY MANAGEMENT SECTION		
Number of freeway centerline miles that agency owns or maintains	32	
Number of freeway centerline miles that is used for planning	32	
Number of freeway entrance ramps that agency owns, operates or maintains	30	
Number of freeway entrance ramps that is used for planning	30	
Type of facilities used to conduct freeway/incident management activities		
Activities housed in a free-standing dedicated building?	No	
Activities housed in a building shared with other activities?	Yes	
Activities conducted in a dedicated control room?	Yes	
Control room contains operator console(s)?	No	
Control room contains electronic wall map?	No	
Control room contains CCTV display(s)?	Yes	
Activities conducted in a room containing workstations or PCs that manage traffic?	No	
Facilities are electronically linked to other transportation mgt facilities?	No	
Staffing and hours of operation of freeway/incident management activities		
Number of full-time agency staff members	1	
Number of full time contractor staff members	NR	
Number of part-time agency staff members	1	
Number of part-time contractor staff members	NR	
Staffed 24 hours day by agency staff or by others	NR	
Staffed during peak hours only by agency staff or by others	agency	
Staffed by others during off-peak hours	No	
Agency staff perform transportation management as an ancillary duty	Yes	
Agency staff dedicated to transportation management duty	No	
Types of operations conducted for freeway/incident management		
Incident detection and management?	Yes	
This metropolitan area?	Yes	
Other metropolitan area?	No	
Statewide?	No	
Monitoring and troubleshooting status of system components?	Yes	
Manual override of ramp metering rates at freeway on-ramps?	No	
Operating transportation management roadside devices?	Yes	
Radio communications with other agencies?	Yes	
Exchange of electronic data with other agencies such as computer aided dispatch?	No	
Real-Time Traffic Data Collection Technologies		
Total number of miles under surveillance with real-time data collection tech.	14	32

Freeway Management
Agencies for Metropolitan Area: Charleston

	South Carolina Department of Transportation	
	1999	**2005**
Number of Stations with data collection technologies		
Loop detectors	0	0
Video imaging detectors	0	0
Probe readers (elec. toll tags, transit vehicles, other technology)	0	0
Microwave radar	0	0
Other (e.g., acoustic detectors)	20	40
Number of Miles covered with data collection technologies		
Loop detectors	0	0
Video imaging detectors	0	0
Probe readers (elec. toll tags, transit vehicles, other technology)	0	0
Microwave radar	0	0
Other (e.g., acoustic detectors)	14	32
Variable Message Signs (VMS) on Freeways		
Candidate locations for deployment of VMS where VMS has been deployed	2	8
Candidate locations for deployment of VMS	NR	NR
Roadside Technologies used to Distribute Traveler Information		
Total number of miles where information is distributed	14	32
Number deployed		
Highway advisory radio	2	3
In-vehicle signing	0	0
Portable variable message signs	2	8
Other	0	0
Miles covered		
Highway advisory radio	14	32
In-vehicle signing	0	0
Portable variable message signs	NR	NR
Other	0	0
Ramp Meters on Freeways		
Number of entrance ramp meters operated under isolated control	0	0
Number of entrance ramp meters operated under central control	0	5
Number of entrance ramp meters that provide preemption for emergency vehicles	0	0
Number of entrance ramp meters that provide priority for transit vehicles	0	0
Total number of metered ramps	0	5
Freeway centerline miles under lane control	NR	NR
Communication Links		
Freeway centerline miles covered by the following type of communication		
Twisted pair cable	0	0
Coaxial cable	0	0
Fiber-optic cable	0	32
Microwave radio	0	0
Other	0	0
ITS Standards Used Related to Freeway Management		

Freeway Management
Agencies for Metropolitan Area: Charleston

	South Carolina Department of Transportation	
	1999	**2005**
ATMS Data Dictionary Sections 1 and 2 (ITE TM 1.01)	Yes	
ATMS Data Dictionary Sections 3 and 4 (ITE TM 1.02)	No	
Message Set for External TMC Communication (ITE-9604-1)	No	
NTCIP Class B Profile (AASHTO TS 3.3)	No	
NTCIP Data Collection and Monitoring Devices (AASHTO TS 3.DCM)	No	
NTCIP Object Definitions for Environmental Sensor Stations (AASHTO TS 3.7)	No	
NTICP Object Definitions for Dynamic Message Signs (AASHTO TS 3.6)	No	
NTICP Object Definitions for Highway Advisory Radio (AASHTO TS 3.HAR)	No	
NTICP Object Definitions for Ramp Meter Control (AASHTO TS 3.RMC)	No	
NTICP Object Definitions for Transportation Sensor Systems (AASHTO TS 3.TSS)	No	
NTICP Object Definitions for Video Camera Control (AASHTO TS 3.VCC)	No	
Would agency be willing to participate in testing of ITS Standards?	No	
Have agreements in place with other agencies to use similar hardware		
and software to aid maintenance and interoperability?	No	
INCIDENT MANAGEMENT SECTION		
Use of Service Patrols to Assist in Detection and Response to Incidents		
Publicly operated service patrol vehicles	Yes	
Privately operated service patrol vehicles operated under public contract	No	
Total number of freeway miles patrolled by these services	14	30
Miles Covered by Methods to Detect and Verify Incidents		
Free cellular phone call to a dedicated phone number other than 911	30	30
Police patrols	NR	NR
Computer algorithms linked to traffic surveillance equipment	14	30
CCTV	NR	NR
Private sector sources (e.g., Shadow Traffic, SmartRoutes)	NR	NR
Other (e.g., free cell phone call to an area radio system, etc.)	NR	NR
Procedures in place for Freeway Incident Response?		
Working agreement(s)/arrangement(s) with other agencies	Yes	
Inter-agency incident management admin. team that meets regularly	Yes	
Major incident response team that responds to major incidents	Yes	
Set of goals/objectives for incident mgt that has been adopted by agencies in region	Yes	
Central focal point for facilitating the two-way flow of information		
among agencies responding to an incident?		
The central focal point is a Freeway or Traffic Management Center	No	
The central focal point is a Police, Fire or joint dispatch center	No	
The central focal point is another center	No	
Methods of Communication Used On-Site at an Incident		
Police		
Two-way radio	Yes	
800 MHz trunked radio	Yes	
Cellular telephone	Yes	

Freeway Management
Agencies for Metropolitan Area: Charleston

	South Carolina Department of Transportation	
	1999	**2005**
Hand-held (i.e., walkie-talkie)	Yes	
Automated data systems (i.e., CAD)	No	
Fire		
Two-way radio	Yes	
800 MHz trunked radio	Yes	
Cellular telephone	Yes	
Hand-held (i.e., walkie-talkie)	Yes	
Automated data systems (i.e., CAD)	No	
DOT		
Two-way radio	Yes	
800 MHz trunked radio	Yes	
Cellular telephone	Yes	
Hand-held (i.e., walkie-talkie)	Yes	
Automated data systems (i.e., CAD)	No	
Towing		
Two-way radio	Yes	
800 MHz trunked radio	Yes	
Cellular telephone	Yes	
Hand-held (i.e., walkie-talkie)	Yes	
Automated data systems (i.e., CAD)	No	
Which police agencies typically respond to incidents on freeways?		
State Police	Yes	
County Police or Sheriff	Yes	
City Police	Yes	
Who provides on-site emergency medical response?		
Fire	Yes	
Emergency Management Service Agency	Yes	
Private hospital	No	
Has a multi-agency contact list been developed in area containing the		
names, phone numbers, etc. for the appropriate response personnel?	Yes	
Is the Incident Command System used to manage incident scenes?	Yes	
Is there a legal specification by state law or formal agreement as to who		
is "in charge" at the incident scene?		
Specified by state law?	Yes	
Formal agreement?	No	
Not specified or don't know?	No	
On-scene command post used to manage activities of responding agencies?	Yes	
Are there communication linkages to a communications traffic/freeway mgt center?	No	
Plan developed and adopted by responding agencies for staging and parking		
response vehicles and equip. at incident site that minimizes lane blockage		
and facilitates the re-opening of lanes?	Yes	
Respondents protected through law or court opinion for liability claims		

	South Carolina Department of Transportation	
	1999	**2005**
for damages to vehicles or cargoes during clearance activities?	No	
Are overturned tank trucks, which are intact and not leaking, uprighted		
without first off-loading?	NR	
Does your state or local jurisdiction have a law that requires drivers		
involved in property-damage-only accidents to move the vehicles		
from travel lanes to a safe location to exchange info and wait for police?	Leg	
Have laws or policies regarding the removal of stalled/abandoned vehicles		
from freeway shoulders?	Yes	
Hours abandoned vehicles are allowed to remain on a freeway shoulder?	25-36	
Have policies or procedures for quick removal of vehicles?	No	
Is Total Station equipment used to investigate major incidents?	No	
Handling of Towing Responses to Incidents		
Formal contract based on qualifications?	No	
Rotation with companies under contract?	No	
Separate lists kept for light and heavy response and for specialty recovery?	Yes	
Rotation list with minimal qualifications?	Yes	
In towing qualifications, do you require towers to be certified under the		
Towing and Recovery Ass. of America's National Drivers Cert. Program?	DK	
_____		
DK: Don't know		
NR: No Response		
Leg: Legislation or action being planned		

Appendix D
Freeway Management Integration

Freeway Management Integration
Agencies for Metropolitan Area: Charleston

Agency Name	South Carolina Department of Transportation	
	1999	**2005**
Agency Returned Survey?	Yes	
Freeway Management Section		
Agencies your agency provides freeway travel times, speeds, and		
conditions information, share infrastructure or coordinates operation		
Freeway Management Agencies		
Provide Information	None listed	South Carolina Department of Transportation
Share Infrastructure	None listed	South Carolina Department of Transportation
Coordinate Operation	None listed	South Carolina Department of Transportation
Incident Management Agencies		
Provide Information	None listed	South Carolina Department of Transportation
Share Infrastructure	None listed	South Carolina Department of Transportation
Coordinate Operation	None listed	South Carolina Department of Transportation
Arterial Management Agencies		
Provide Information	None listed	Charleston City Traffic & Transportation Departmen
Share Infrastructure	None listed	Charleston City Traffic & Transportation Departmen
Coordinate Operation	None listed	Charleston City Traffic & Transportation Departmen
Public Transit Operators		
Provide Information	None listed	Charleston Transit Administration
Share Infrastructure	None listed	Charleston Transit Administration
Coordinate Operation	None listed	Charleston Transit Administration
Receiving real-time information via electronic means from others		
Incident Management agencies from which your agency receives		
incident severity, location, and type information	None listed	South Carolina Department of Transportation
Arterial Management agencies from which your agency receives		
arterial travel times, speeds, and conditions	None listed	None listed
Public Transit operators from which your agency receives		
freeway travel times derived from vehicle probes	None listed	None listed
Toll Collection agencies from which your agency receives freeway travel		
times derived from vehicles probes	None listed	None listed
Freeway Incident Management Section		

Freeway Management Integration
Agencies for Metropolitan Area: Charleston

Agency Name	South Carolina Department of Transportation	
	1999	**2005**
Agencies your agency provides incident severity, location, and type info.		
and/or shares infrastructure and/or coordinates operation		
Arterial Management Agencies		
Provide Information	None listed	Charleston City Traffic & Transportation Departmen
Share Infrastructure	None listed	Charleston City Traffic & Transportation Departmen
Coordinate Operation	None listed	Charleston City Traffic & Transportation Departmen
Emergency Management Agencies		
Provide Information	None listed	North Charleston City Fire Department, Dorchester County Emergency Medical Services, North Charleston City Police Department, Charleston County Sheriff Office, Berkeley County Sheriff Department, Berkeley County Emergency Preparedness Agency, Dorchester County Sheriff, Charleston City Fire Department, Charleston City Police Department
Share Infrastructure	None listed	North Charleston City Fire Department, Dorchester County Emergency Medical Services, North Charleston City Police Department, Charleston County Sheriff Office, Berkeley County Sheriff Department, Berkeley County Emergency Preparedness Agency, Dorchester County Sheriff, Charleston City Fire Department, Charleston City Police Department
Coordinate Operation	None listed	North Charleston City Fire Department, Dorchester County Emergency Medical Services, North Charleston City Police Department, Charleston County Sheriff Office, Berkeley County Sheriff Department, Berkeley County Emergency Preparedness Agency, Dorchester County Sheriff, Charleston City Fire Department, Charleston City Police Department
Freeway Management Agencies		
Provide Information	None listed	South Carolina Department of Transportation

Freeway Management Integration
Agencies for Metropolitan Area: Charleston

Agency Name	South Carolina Department of Transportation	
	1999	**2005**
Share Infrastructure	None listed	South Carolina Department of Transportation
Coordinate Operation	None listed	South Carolina Department of Transportation
Public Transit Operators		
Provide Information	None listed	Charleston Transit Administration
Share Infrastructure	None listed	Charleston Transit Administration
Coordinate Operation	None listed	Charleston Transit Administration
Receiving real-time information via electronic means from others		
Emergency Management agencies from which your agency receives		
incident clearance and/or incident severity and type		
Receive Arterial Incident Clearance Information	None listed	North Charleston City Fire Department, Dorchester County Sheriff, Dorchester County Emergency Medical Services, Berkeley County Emergency Preparedness Agency, Berkeley County Sheriff Department, Charleston City Fire Department, Charleston City Police Department, Charleston County Sheriff Office, North Charleston City Fire Department, North Charleston City Police Department
Receive Arterial Incident Severity Information	None listed	North Charleston City Fire Department, Dorchester County Sheriff, Dorchester County Emergency Medical Services, Berkeley County Emergency Preparedness Agency, Berkeley County Sheriff Department, Charleston City Fire Department, Charleston City Police Department, Charleston County Sheriff Office, North Charleston City Fire Department, North Charleston City Police Department
Arterial Management agencies from which your agency receives		
arterial travel times, speeds, and conditions	None listed	Charleston City Traffic & Transportation Dept.
Freeway Management agencies from which your agency receives		
freeway travel times, speeds, and conditions	None listed	South Carolina Department of Transportation

*short survey: Agency responded using a short survey. The survey did not include names of individual agencies, but only identified whether integration exists.

Appendix E
Freeway Management Information Collection and Dissemination

Data Collection and Dissemination: Freeway Management
Agencies for Metropolitan Area: Charleston

Agency Name	South Carolina Department of Transportation	
	1999	**2005**
Agency Returned Survey?	Yes	
Freeway Management Section		
Data collected, archived, and/or transferred to another agency		
Collected by your agency	Traffic volumes, Traffic speeds, Lane occupancy, Vehicle classification, Road conditions, Weather conditions, Incidents, Current work zones, Scheduled work zones, Emergency/evacuation routes and procedures	Traffic volumes, Traffic speeds, Lane occupancy, Vehicle classification, Road conditions, Weather conditions, Incidents, Current work zones, Scheduled work zones, Emergency/evacuation routes and procedures
Archived by your agency	Traffic volumes, Traffic speeds, Lane occupancy, Vehicle classification, Road conditions, Weather conditions, Incidents, Current work zones, Scheduled work zones, Emergency/evacuation routes and procedures	Traffic volumes, Traffic speeds, Lane occupancy, Vehicle classification, Road conditions, Weather conditions, Incidents, Current work zones, Scheduled work zones, Emergency/evacuation routes and procedures
Transferred to another agency by your agency	Traffic volumes, Traffic speeds, Lane occupancy, Vehicle classification, Road conditions, Weather conditions, Incidents, Current work zones, Scheduled work zones, Emergency/evacuation routes and procedures	Traffic volumes, Traffic speeds, Lane occupancy, Vehicle classification, Road conditions, Weather conditions, Incidents, Current work zones, Scheduled work zones, Emergency/evacuation routes and procedures
Importance of making information available to the public		
Ranked High	Weather conditions, Incidents, Emergency/evacuation routes and procedures	
Ranked Medium	Traffic volumes, Traffic speeds, Lane occupancy, Vehicle classification, Road conditions, Current work zones, Scheduled work zones	
Ranked Low	NR	
Groups that make requests for the data	Universities, State DOT personnel, Federal DOT personnel, Media (I.e., TV stations, radio stations), MPOs, Consultants	
What is the data used for?	Traffic analysis, Planning, Roadway impact analysis, Dissemination to the public	
Methods used to disseminate freeway information to the public		
Technologies your agency uses to disseminate:	NR	Telephone system, Internet Web sites, Cell phone/voice
Technologies your agency (through another agency or org.) uses to disseminate:	NR	Telephone system, Internet Web sites, Cell phone/voice
Internet web site reporting freeway conditions	NR	
Telephone system for reporting freeway information to the public	NR	

Data Collection and Dissemination: Freeway Management
Agencies for Metropolitan Area: Charleston

Agency Name	South Carolina Department of Transportation	
	1999	**2005**
Organizations your agency sends information for dissemination to the public	NR	
Freeway Incident Management Section		
Methods used to distribute incident location and severity information		
to the public		
Technologies your agency uses to disseminate:	Interactive TV	Internet Web sites, Interactive TV, In-vehicle navigation systems, Cell phone/voice
Technologies your agency (through another agency or org.) uses to disseminate:	Interactive TV	Internet Web sites, Interactive TV, In-vehicle navigation systems, Cell phone/voice
Internet web site reporting incident information	NR	
Telephone system for reporting incident information to the public	NR	
Organizations your agency sends information for dissemination to the public	NR	

Appendix F
Arterial Management Components

Appendix G
Arterial Management Integration

Appendix H
Arterial Management Information Collection and Dissemination

Appendix I
Transit Management Components

Transit Management
Agencies for Metropolitan Area: Charleston

	Charleston Transit Administration	
	1999	**2005**
Agency Returned Survey?	Yes	
Number of vehicles used in revenue service		
Fixed Route Bus	59	NR
Heavy or Rapid Rail	0	NR
Light Rail	0	NR
Demand Responsive	17	NR
Commuter Rail	NR	NR
Ferry Boat	NR	NR
Have of plan to have an Automated Vehicle Location System?	No	
Primary and Secondary Location Technologies Used		
Primary Technologies		
GPS	No	No
Sign/Odometer	No	No
Dead-Reckoning	No	No
LORAN C	No	No
Other	No	No
Backup Technologies		
GPS	No	No
Sign/Odometer	No	No
Dead-Reckoning	No	No
LORAN C	No	No
Other	No	No
Number of Vehicles Equipped with AVL		
Fixed Route Bus	NR	NR
Heavy or Rapid Rail	NR	NR
Light Rail	NR	NR
Demand Responsive	NR	NR
Commuter Rail	NR	NR
Ferry Boat	NR	NR
Motor Buses Operated as Vehicle Probes		
Number of Motor Buses equipped as probes on freeways?	NR	
Number of Motor Buses equipped as probes on arterials?	NR	
Have Organized Regional Incident Management Program?	Yes	
Have Automated Traveler Information System?	Yes	
Services Automated Traveler Info. System Applies:		

Transit Management
Agencies for Metropolitan Area: Charleston

	Charleston Transit Administration	
	1999	**2005**
Fixed Route	Yes	
Heavy Rail	No	
Light Rail	No	
Demand Responsive	Yes	
Commuter Rail	No	
Ferry	No	
Locations where traveler information is displayed to public		
Number of bus stops on fixed transit routes	1,000	1,000
Bus stops on fixed transit routes that display traveler info to the public	NR	NR
Number of rail stations	NR	NR
Number of rail stations that display traveler information	NR	NR
Number of other locations that display traveler information to public	NR	NR
Number of vehicles the traveler information system has available		
Fixed Route Bus	59	59
Heavy or Rapid Rail	NR	NR
Light Rail	NR	NR
Demand Responsive	NR	NR
Commuter Rail	NR	NR
Ferry Boat	NR	NR
Deployment of Communications Technology		
Attributes of Radio System:		
Digital?	No	
Analog?	Yes	
Trunked?	Yes	
Regular?	No	
Services that use a Digital or Trunked Radio System		
Digital Only		
Fixed Route Bus	No	Yes
Heavy or Rapid Rail	No	No
Light Rail	No	No
Demand Responsive	No	Yes
Commuter Rail	No	No
Ferry Boat	No	No
Trunked Only		
Fixed Route Bus	No	No
Heavy or Rapid Rail	No	No
Light Rail	No	No
Demand Responsive	No	No
Commuter Rail	No	No

Transit Management
Agencies for Metropolitan Area: Charleston

	Charleston Transit Administration	
	1999	**2005**
Ferry Boat	No	No
Have of plan to have Automatic Passenger Counters (APCs)?	No	
Methods used to count passengers		
Treadle Mats	No	
Infrared Beams	No	
Primary and Secondary Location Technologies Used		
Primary Technologies		
GPS	No	No
Differential GPS	No	No
Signpost/Odometer	No	No
Dead_Reckoning	No	No
LORAN C	No	No
Other	No	No
Backup Technologies		
GPS	No	No
Differential GPS	No	No
Signpost/Odometer	No	No
Dead_Reckoning	No	No
LORAN C	No	No
Other	No	No
Number of Vehicles with APCs		
Fixed Route Bus	NR	NR
Heavy or Rapid Rail	NR	NR
Light Rail	NR	NR
Demand Responsive	NR	NR
Commuter Rail	NR	NR
Ferry Boat	NR	NR
Remote Real-Time Monitoring and Computer Assisted Dispatching		
Remote Real-Time Monitoring		
Fixed Route Bus	59	59
Heavy or Rapid Rail	NR	NR
Light Rail	NR	NR
Demand Responsive	17	17
Commuter Rail	NR	NR
Ferry Boat	NR	NR
Automated Dispatching or Control Software		
Fixed Route Bus	NR	NR
Heavy or Rapid Rail	NR	NR

Transit Management
Agencies for Metropolitan Area: Charleston

	Charleston Transit Administration	
	1999	**2005**
Light Rail	NR	NR
Demand Responsive	NR	NR
Commuter Rail	NR	NR
Ferry Boat	NR	NR
Coordinate or plan to coordinate travel request and vehicle		
dispatching for multiple agencies?	No	
Is there or will there be a Transportation Management Center		
(TMC) in the region that controls transit and highway modes?	NR	
Modes that TMC currently controls:		
Highways	No	No
Fixed Route Bus	No	No
Heavy or Rapid Rail	No	No
Light Rail	No	No
Demand Responsive	No	No
Commuter Rail	No	No
Ferry Boat	No	No
Other	No	No
Priority at Traffic Signals and Ramp Meter Priority		
Priority at Traffic Signals		
Fixed Route Bus	NR	NR
Light Rail	NR	NR
Demand Responsive	NR	NR
Ramp Meter Priority		
Fixed Route Bus	NR	NR
Demand Responsive	NR	NR
Number of Vehicles Equipped with Navigation Aids		
Fixed Route Bus	NR	NR
Heavy or Rapid Rail	NR	NR
Light Rail	NR	NR
Demand Responsive	NR	NR
Commuter Rail	NR	NR
Ferry Boat	NR	NR
ITS Standards Used Related to Transit Management		
TCIP On Boad Objects (TCIP-OB)	No	
TCIP Traffic Management Objects (TCIP-TM)	No	
TCIP Common Public Transportation Objects (TCIP-CPT)	No	
TCIP Passenger Information Objects (TCIP-PI)	No	

Transit Management
Agencies for Metropolitan Area: Charleston

	Charleston Transit Administration	
	1999	**2005**
TCIP Incident Management Objects (TCIP-IM)	No	
TCIP Fare Collection Objects (TCIP-FC)	Yes	
TCIP Spatial Representation Objects (TCIP-SP)	No	
TCIP Control Center Objects (TCIP-CC)	No	
TCIP Scheduling/Runcutting Objects (TCIP-SCH)	No	
Send data communication between micro computer and heavy duty		
vehicle applications (SAE J1708)	No	
Would agency be willing to participate in testing of ITS Standards?	Yes	
Have agreements in place with other agencies to use similar hardware		
and software to aid maintenance and interoperability?	No	
Electronic Fare Payment		
Have full operational Electronic Fare Payment System?	Yes	
Methods of Fare Payment		
Stored value card with fare deducted for each trip		
Magnetic Stripe	Yes	
Smart Card	No	
Debit Card	No	
Billed by the month for trips taken		
Magnetic Stripe	No	
Smart Card	No	
Credit Card	No	
Monthly Pass		
Magnetic Stripe	Yes	
Smart Card	No	
Vehicles/Stations Equipped with Automated Payment Mechanism		
Magnetic Stripe Readers		
Fixed Route Bus Vehicles	58	58
Heavy or Rapid Rail Stations	NR	NR
Light Rail Stations	NR	NR
Demand Responsive Vehicles	NR	17
Commuter Rail Stations	NR	NR
Ferry Boat Landings	NR	NR
Smart Card Readers		
Fixed Route Bus Vehicles	NR	58
Heavy or Rapid Rail Stations	NR	NR
Light Rail Stations	NR	NR
Demand Responsive Vehicles	NR	17
Commuter Rail Stations	NR	NR
Ferry Boat Landings	NR	NR
Credit Card		

Transit Management
Agencies for Metropolitan Area: Charleston

	Charleston Transit Administration	
	1999	**2005**
Fixed Route Bus Vehicles	NR	NR
Heavy or Rapid Rail Stations	NR	NR
Light Rail Stations	NR	NR
Demand Responsive Vehicles	NR	NR
Commuter Rail Stations	NR	NR
Ferry Boat Landings	NR	NR
Debit Card		
Fixed Route Bus Vehicles	NR	NR
Heavy or Rapid Rail Stations	NR	NR
Light Rail Stations	NR	NR
Demand Responsive Vehicles	NR	NR
Commuter Rail Stations	NR	NR
Ferry Boat Landings	NR	NR
_____		
NR: No Response		

Appendix J
Transit Management Integration

Transit Management Integration
Agencies for Metropolitan Area: Charleston

Agency Name	Charleston Transit Administration	
	1999	**2005**
Agency Returned Survey?	Yes	
Transit operators in the region that use the same electronic payment system	None listed	
Toll operators from whom you accept electronic payment of transit		
fare through the use of ETC media	None listed	
Receiving real-time information via electronic means from others		
Freeway Management agencies from which your agency receives		
freeway travel times, speeds, and conditions		
Receive Information	None listed	None listed
Share Infrastructure	None listed	None listed
Arterial Management agencies from which your agency receives		
arterial travel times, speeds, and conditions		
Receive Information	None listed	None listed
Share Infrastructure	None listed	None listed
Incident Management agencies from which your agency receives		
incident severity, location, and type		
Receive Information	None listed	South Carolina Department of Transportation
Share Infrastructure	None listed	None listed

Appendix K
Transit Management Information Collection and Dissemination

Data Collection and Dissemination: Transit Management
Agencies for Metropolitan Area: Charleston

Agency Name	Charleston Transit Administration	
	1999	**2005**
Agency Returned Survey?	Yes	
Methods used to disseminate transit information to the public		
Technologies your agency uses to disseminate:		
Transit routes, schedules and fares	Variable Message Signs (in vehicle), Kiosks, Telephone System	Variable Message Signs (in vehicle), Kiosks, Telephone System
Real-time transit schedule adherence or arrival and departure times	Telephone System	Telephone System
Technologies employed by other organization receiving your data		
Transit routes, schedules and fares	NR	NR
Real-time transit schedule adherence or arrival and departure times	NR	NR
Internet web site reporting transit routes, schedules and fare, etc.	NR	
Telephone system for reporting transit information to the public	NR	
Organizations your agency sends information for dissemination to the public	NR	
Data collected, archived, and/or transferred to another agency		
Collected by your agency	Emergency/evacuation routes and procedures, Incidents, Passenger information (e.g., surveys, O/D)	Emergency/evacuation routes and procedures, Incidents, Passenger information (e.g., surveys, O/D)
Archived by your agency	Emergency/evacuation routes and procedures, Incidents, Passenger information (e.g., surveys, O/D)	Emergency/evacuation routes and procedures, Incidents, Passenger information (e.g., surveys, O/D)
Transferred to another agency by your agency	NR	NR
Importance of making information available to the public		
Ranked High	NR	
Ranked Medium	Emergency/evacuation routes and procedures, Incidents, Passenger information (e.g., surveys,	
Ranked Low	NR	
Groups that make requests for the data	Federal DOT personnel, State DOT personnel, Universities, Consultants, MPOs, Media (I.e., TV stations, radio stations)	
What is the data used for?	Dissemination to the public, Planning, Traffic analysis	

Appendix L
Emergency Management

Emergency Management Agencies for Metropolitan Area: Charleston

	Total Vehicles		Navigation Capabilities		AVL		CAD		CAD Equipped with Mobile Data Terminal		Vehicles Equipped with Preemption		Participate in Formal Incident Mgt Program	Send Incident Info to other agencies	List of agencies receiving data
Agency Name	1999	2005	1999	2005	1999	2005	1999	2005	1999	2005	1999	2005			
Berkeley County Emergency Preparedness Agency	14	16	0	0	0	0	0	0	NR	NR	0	0	No	No	None listed
Berkeley County Sheriff Department	110	NR	0	NR	0	NR	0	NR	0	NR	0	NR	No	Yes	None listed
Charleston City Fire Department	25	NR	NR	NR	NR	NR	25	NR	NR	NR	NR	NR	Yes	No	None listed
Charleston City Police Department	25	NR	NR	NR	NR	NR	25	NR	NR	NR	NR	NR	Yes	No	None listed
Charleston County Sheriff Office	260	NR	0	NR	0	NR	0	NR	0	NR	0	NR	Yes	Yes	Emergency Preparedness Department, South Carolina State Emergency Preparedness Depart
Dorchester County Emergency Medical Services	10	12	0	NR	0	NR	10	NR	NR	NR	0	NR	No	No	None listed
Dorchester County Sheriff	88	NR	0	NR	0	NR	0	NR	NR	NR	0	NR	No	No	None listed
North Charleston City Fire Department	47	50	0	NR	0	NR	0	NR	0	NR	0	NR	Yes	Yes	State Fire Marshal Office, Emergency Planning Department, Coast Guard, Charleston County HazMat Coordinator
North Charleston City Police Department	281	294	0	0	0	0	0	0	0	0	0	0	Yes	No	None listed