

# **Tracking the Deployment of the Integrated Metropolitan Intelligent Transportation Systems Infrastructure in Atlanta, GA**

**FY04 Results**

**June 2005**

For additional information, please contact:

Joseph I. Peters, Ph.D.  
ITS Program Assessment Coordinator  
ITS Joint Program Office, Room 3416  
Federal Highway Administration (HOIT-1)  
400 Seventh St., S.W.  
Washington, D.C. 20590  
PHONE: (202) 366-2202, FAX: (202) 493-2027  
E-mail: [Joe.peters@fhwa.dot.gov](mailto:Joe.peters@fhwa.dot.gov)

#### Notice

The Federal Highway Administration provides high-quality information to serve Government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. FHWA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Tracking the Deployment of the Integrated Metropolitan Intelligent Transportation Systems Infrastructure in Atlanta: FY2004 Results		5. Report Date July 2005	
		6. Performing Organization Code	
7. Author(s) Steve Gordon and Jeffrey Trombly		8. Performing Organization Report No.	
9. Performing Organization Name and Address  Oak Ridge National Laboratory P.O. Box 2008, Bldg 4500N, MS 6206 Oak Ridge, TN 37831-6206  Science Applications International Corporation 301 Laboratory Road Oak Ridge, TN 37831		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No.  DTFH61-00-Y-30014	
12. Sponsorship Agency Name and Address  Department of Transportation FHWA ITS Joint Program Office 400 Seventh Street, S.W. - Room 3422 Washington, DC 20590		13. Type of Report and Period Covered	
		14. Sponsoring Agency Code  HOIT	
15. Supplementary Notes  Contact person at JPO - Joseph Peters			
16. Abstract  This report describes the results of a major data gathering effort aimed at tracking deployment of nine infrastructure components of the metropolitan ITS infrastructure in Atlanta. The nine components are: Freeway Management, Incident Management, Arterial Management, Electronic Toll Collection, Electronic Fare Payment, Transit Management, Highway-Rail Intersections, Emergency Management, and Regional Multimodal Traveler Information. Deployment is tracked through the use of indicators tied to the major functions of each component. In addition, integration of components is tracked through examining the transfer of information between agencies operating.			
17. Key Words  Intelligent Transportation Systems, ITS, Integration, Deployment Tracking, ITS Component Indicators, Regional ITS Planning, National ITS Infrastructure, Atlanta		18. Distribution Statement  No restrictions. This document is available to the public from:  National Technical Information Service Springfield, Virginia 22161	
19. Security Classif. (of this report)  Unclassified	20. Security Classif. (of this page)  Unclassified	21. No. of Pages  45	22. Price

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

## Table of Contents

Metropolitan Area Map.....	v
Background and Purpose .....	1
Summary 2004 Survey Results.....	3
Component .....	3
Integration.....	6
Detailed 2004 Survey Results.....	12
Freeway Management Components.....	13
Freeway Management Integration .....	14
Freeway and Arterial Incident Management Components .....	15
Incident Management Integration .....	16
Arterial Management Components .....	17
Arterial Management Integration.....	18
Transit Management Components .....	19
Transit Management Integration.....	20
Electronic Fare Payment Components.....	21
Electronic Fare Payment Integration .....	22
Highway-Rail Intersections Components .....	23
Highway-Rail Intersections Integration.....	24
Emergency Management Components .....	25
Emergency Management Integration.....	26
Regional Multimodal Traveler Information Components .....	27
Regional Multimodal Traveler Information Integration .....	28
Electronic Toll Collection Components.....	29
Electronic Toll Collection Integration .....	30

### List of appendices:

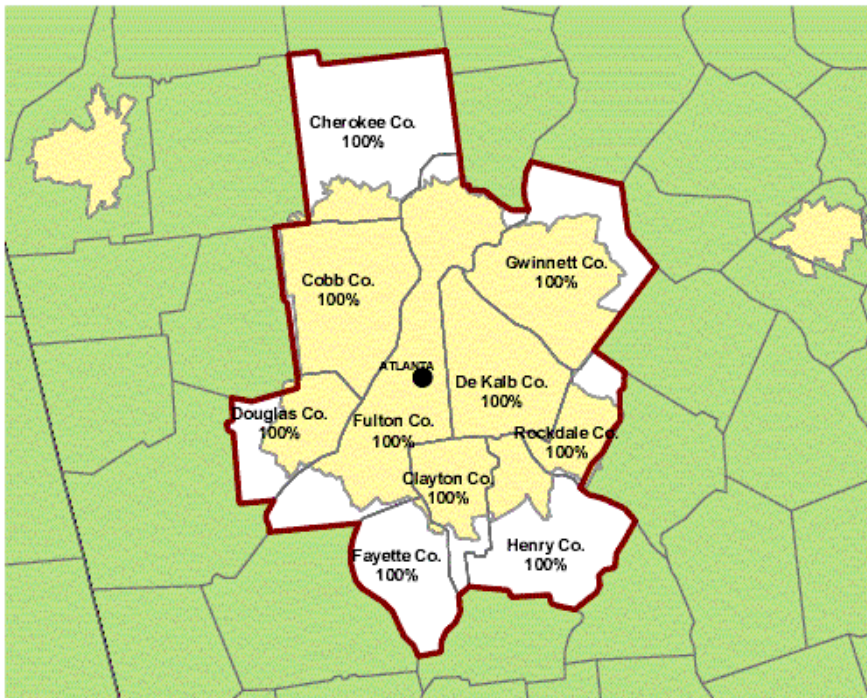
Appendix A. Component Indicators

Appendix B. Integration Indicators

Appendix C. Surveyed Agencies

# Metropolitan Area Map

## ATLANTA REGIONAL COMMISSION, GA



- City Included in Surveys
  - ⚡ Metropolitan Planning Area Boundary
  - ⚡ County Boundary
  - Urbanized Area
  - Outside Survey Area
- Percentage on the Map Represents Percentage of County Population Included within MPO Boundary

## Background and Purpose

In January 1996, former Secretary Peña set a goal of deploying the integrated metropolitan Intelligent Transportation System (ITS) infrastructure in 75<sup>1</sup> of the nation's largest metropolitan areas by the end of 2005.

*"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."*<sup>2</sup>

-- former Secretary Peña, 1996

In 1997, the United States Department of Transportation (U.S. DOT) 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 developing 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. DOT 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.

During the spring and summer of 2004, 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 Atlanta metropolitan area was among the areas surveyed in 1997, 1999, 2000, 2002, and again in 2004. This report presents the results of the 2004 survey efforts and compares the

---

<sup>1</sup> Since former 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.

<sup>2</sup> Excerpt of a speech delivered by former Secretary of Transportation Peña at the Transportation Research Board in Washington, DC on January 10, 1996.

results of the 1997, 1999, 2000, 2002, and 2004 data gathering efforts. The overall response rate for the surveys administered in the Atlanta region was 91% in 1997, 96% in 1999, 94% in 2000, 98% in 2002, and 95% in 2004.

The next section contains a summary of the results for the city of Atlanta and for the nation as a whole. This is followed by detailed information on each infrastructure component for Atlanta. Included in this report is a set of appendices containing tables with all the indicators, a 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 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  
P.O.Box 2501, 301 Laboratory Road  
Oak Ridge, TN 37831-2501  
(865) 481-8563 (voice)  
(865) 481-2941 (fax)  
jeffrey.w.trombly@saic.com

## Summary 2004 Survey Results

### Component

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.

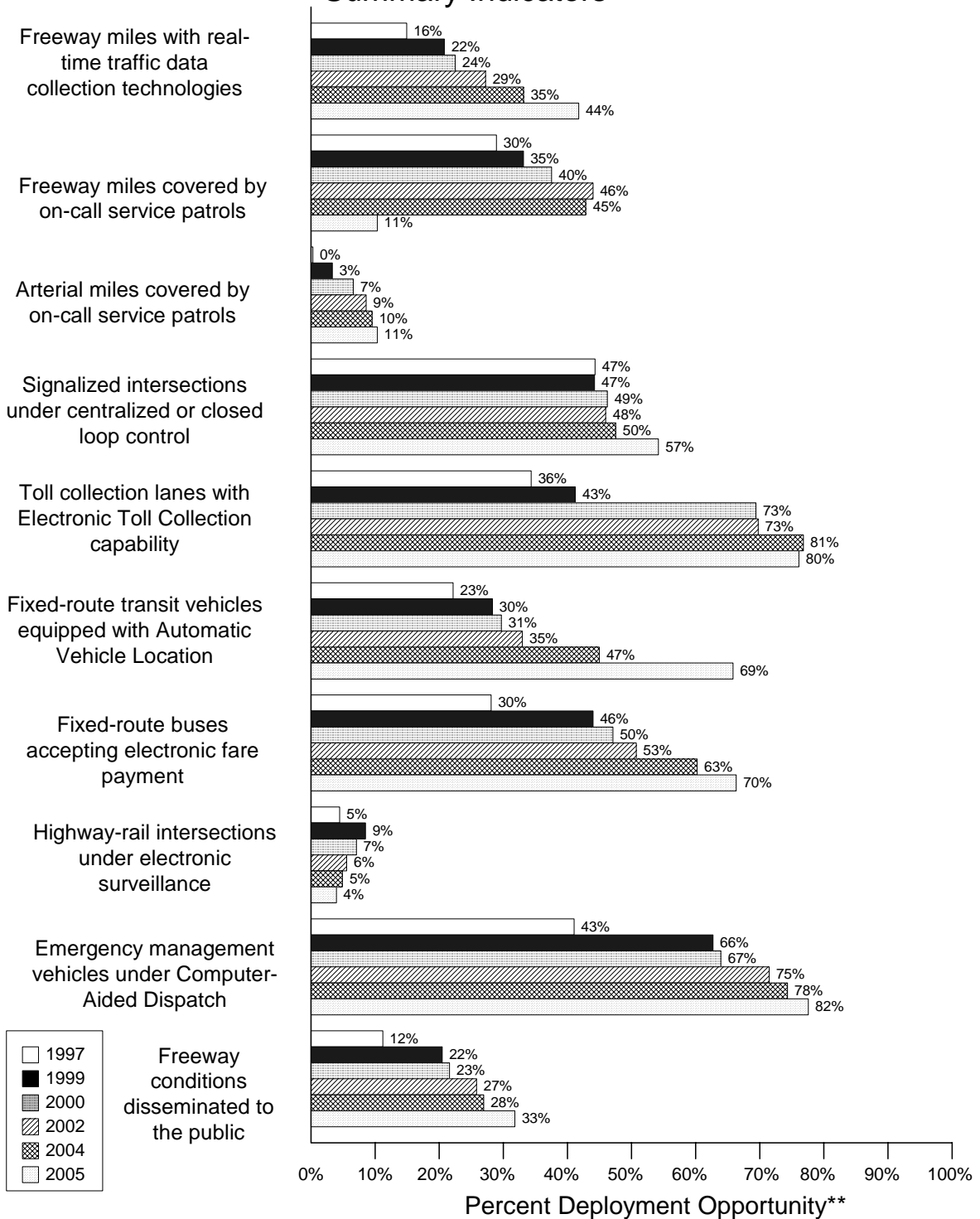
The following two figures portray the surrogate indicators for each of the nine components in Atlanta and the same indicators at the national level. These are judged to be the single best representative of a component and are being used as summary indicators for each component. The summary indicators 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 Variable Message Signs (VMS) or Highway Advisory Radio (HAR). The indicators are surrogates that do not necessarily reflect the full breadth of metropolitan ITS deployment activity.

Data are shown for each year surveyed and, in addition, an estimate for what the level of deployment will be in the year 2005.



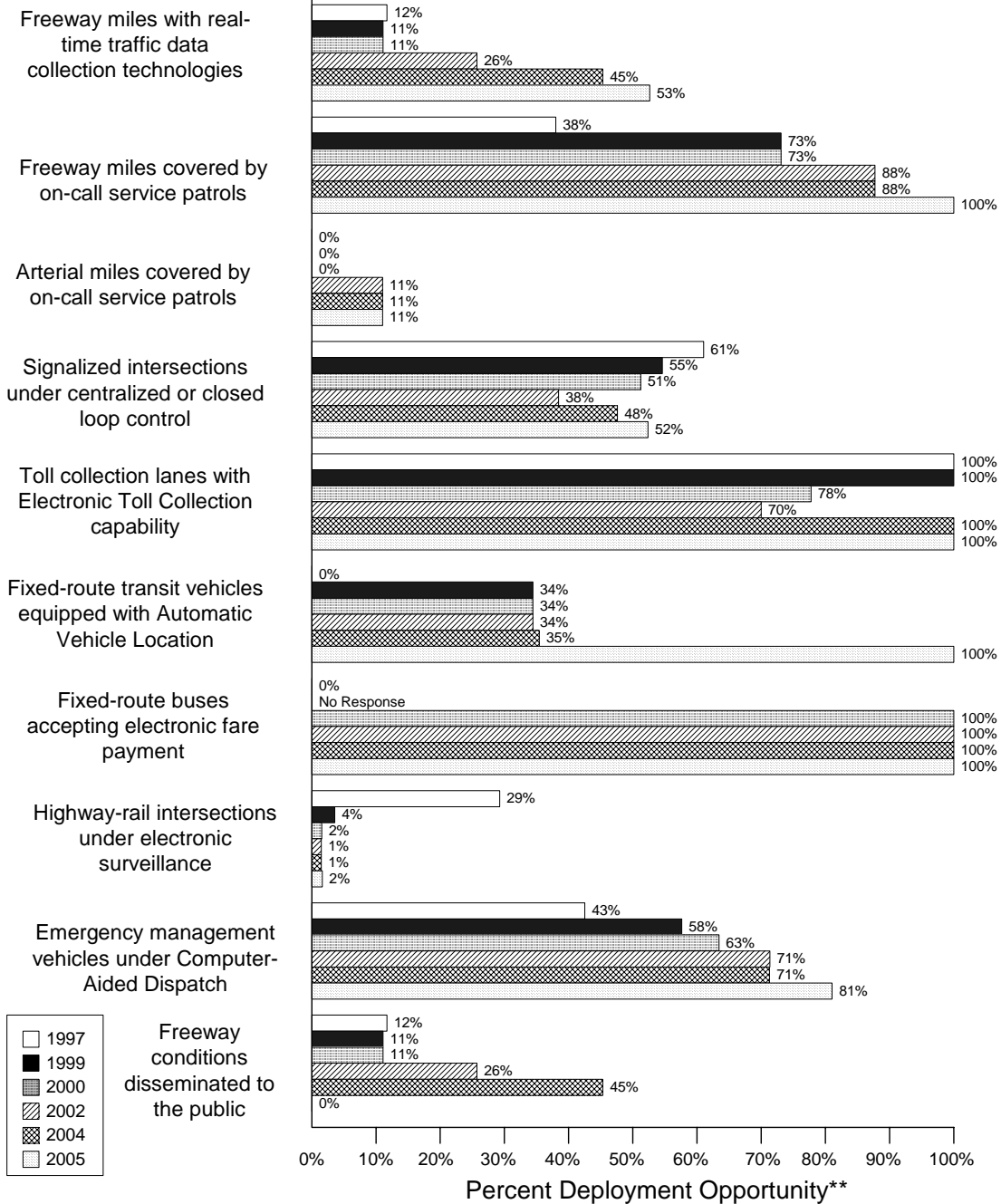
## National Summary Indicators\*



\* 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.

# Atlanta

## Summary Indicators\*



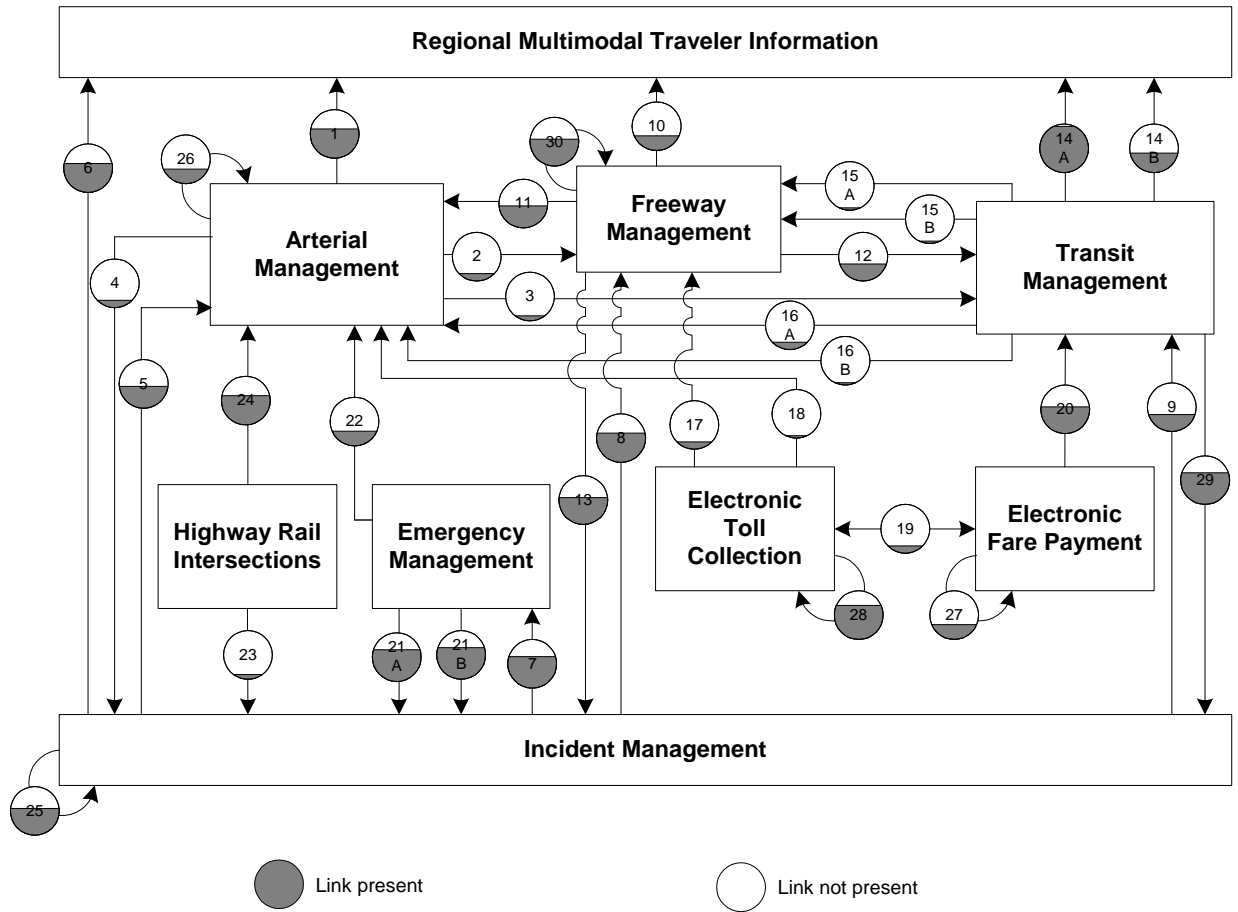
\* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.  
 \*\* Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

## **Integration**

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. The 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.

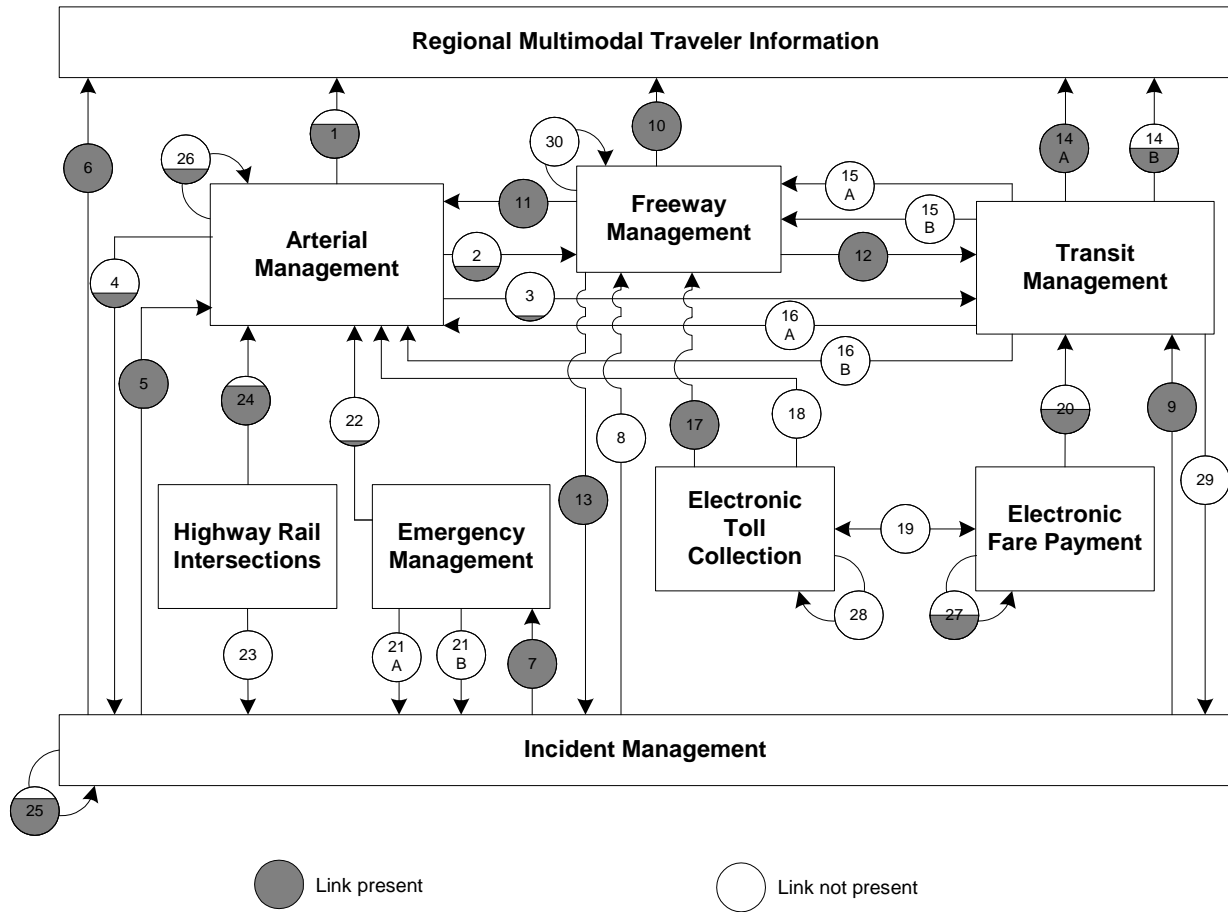
As with the component indicators, definitions for inter- and intra-component integration were developed for each component, and indicators, derived from these definitions, were produced for each component. A total of 34 individual integration indicators was specified and is portrayed in the third figure that follows. Each integration indicator has been assigned a number and an origin/destination path from one ITS infrastructure component to another. For example, the number “10” identifies the integration of information from the Freeway Management component to the Regional Multimodal Traveler Information component. The following two figures portray the national integration indicators and the integration indicators for Atlanta as of 2004.

# 78 Large Metropolitan Areas Integration Links



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

# Atlanta Integration Links



<b>Link</b>	<b>Description</b>	<b>Purpose</b>
1	Arterial Management to Regional Multimodal Traveler Information	Arterial travel time, speed, and condition information are displayed by Regional Multimodal Traveler Information media.
2	Arterial Management to Freeway Management	Freeway Management Center monitors arterial travel times, speeds, and conditions using data provided from Traffic Signal Control in order to adjust ramp meter timing, lane control or HAR in response to changes in real-time conditions on a parallel arterial.
3	Arterial Management to Transit Management	Transit Management adjusts transit routes and schedules in response to arterial travel times, speeds, and conditions information collected as part of Traffic Signal Control.
4	Arterial Management to Incident Management	Incident Management monitors real-time arterial travel times, speeds, and conditions using data provided from Traffic Signal Control to detect arterial incidents and manage incident response activities.
5	Incident Management to Arterial Management	Traffic Signal Control monitors incident severity, location, and type information collected by Incident Management to adjust traffic signal timing or information provided to travelers in response to incident management activities.
6	Incident Management to Regional Multimodal Traveler Information	Incident location, severity, and type information are displayed by Regional Multimodal Traveler Information media.
7	Incident Management to Emergency Management	Incident severity, location, and type data collected as part of Incident Management are used to notify Emergency Management for incident response.
8	Incident Management to Freeway Management	Incident severity, location, and type data collected by Incident Management are monitored by Freeway Management for the purpose of adjusting ramp meter timing, lane control or HAR messages in response to freeway or arterial incidents.
9	Incident Management to Transit Management	Transit Management adjusts transit routes and schedules in response to incident severity, location, and type data collected as part of Incident Management.
10	Freeway Management to Regional Multimodal Traveler Information	Freeway travel time, speed, and condition information are displayed by Regional Multimodal Traveler Information media.

<b>Link</b>	<b>Description</b>	<b>Purpose</b>
11	Freeway Management to Arterial Management	Freeway travel time, speeds, and conditions data collected by Freeway Management are used by Traffic Signal Control to adjust arterial traffic signal timing or arterial VMS messages in response to changing freeway conditions.
12	Freeway Management to Transit Management	Transit Management adjusts transit routes and schedules in response to freeway travel times, speeds, and conditions information collected as part of Freeway Management.
13	Freeway Management to Incident Management	Incident Management monitors freeway travel time, speed, and condition data collected by Freeway Management to detect incidents or manage incident response.
14a	Transit Management to Regional Multimodal Traveler Information (static route information)	Transit routes, schedules, and fare information are displayed on Regional Multimodal Traveler Information media.
14b	Transit Management to Regional Multimodal Traveler Information (schedule adherence information)	Transit schedule adherence information are displayed on Regional Multimodal Traveler Information media.
15a	Transit Management to Freeway Management	Freeway ramp meters are adjusted in response to receipt of transit vehicle pre-emption signal.
15b	Transit Management to Freeway Management (transit vehicle probes)	Transit vehicles equipped as probes are monitored by Freeway Management for the purpose of determining freeway travel speeds or travel times.
16a	Transit Management to Arterial Management	Traffic signals are adjusted in response to receipt of transit vehicle pre-emption signal.
16b	Transit Management to Arterial Management (transit vehicle probes)	Transit vehicles equipped as probes are monitored by Traffic Signal Control for the purpose of determining arterial speeds or travel times.
17	Electronic Toll Collection to Freeway Management (ETC equipped probes)	Vehicles equipped with electronic toll collection (ETC) tags are monitored by Freeway Management for the purpose of determining freeway travel speeds or travel times.
18	Electronic Toll Collection to Arterial Management (ETC equipped probes)	Vehicles equipped with electronic toll collection (ETC) tags are monitored by Traffic Signal Control for the purpose of determining arterial travel speeds or travel times.
19	Electronic Fare Payment and Electronic Toll Collection	Transit operators accept ETC- issued tags to pay for transit fares.
20	Electronic Fare Payment to Transit Management	Rider ship details collected as part of Electronic Fare Payment are used in transit service planning by Transit Management.

<b>Link</b>	<b>Description</b>	<b>Purpose</b>
21a	Emergency Management to Incident Management (incident notification)	Incident Management is notified of incident location, severity, and type by Emergency Management for the purpose of identifying incidents on freeways or arterials.
21b	Emergency Management to Incident Management (incident clearance)	Incident Management is notified of incident clearance activities by Emergency Management for the purpose of managing incident response on freeways or arterials.
22	Emergency Management to Arterial Management	Emergency Management vehicles are equipped with traffic signal priority capability.
23	Highway-rail intersections to Incident Management (crossing status)	Incident Management is notified of crossing blockages by Highway-rail intersection for the purpose of managing incident response.
24	Highway-rail intersections to Arterial Management (crossing status)	Highway-rail intersection and Traffic Signal Control are interconnected for the purpose of adjusting traffic signal timing in response to train crossing.
25	Incident Management intra-component	Agencies participating in formal working agreements or incident management plans coordinate incident detection, verification, and response.
26	Arterial Management intra-component	Agencies operating traffic signals along common corridors sharing information and possibly control of traffic signals to maintain progression on arterial routes.
27	Electronic Fare Payment intra-component.	Operators of different public transit services share common electronic fare payment media.
28	Electronic Toll Collection intra-component	Electronic Toll Collection agencies share a common toll tag for the purpose of facilitating “seam less” toll transactions.
29	Transit Management to Incident Management (incident reporting)	Transit agency operators or dispatchers report traffic incidents (e.g. stalled vehicles, crashes) as part of an organized regional incident management program.
30	Freeway Management intra-component	Freeway travel time, speeds, and conditions data collected by Freeway Management agencies are used by other Freeway Management agencies in response to changing freeway conditions for the purpose of adjusting ramp meter timing, lane control or HAR messages in response to freeway or arterial incidents.



## Detailed 2004 Survey Results

The following figures summarize the complete set of component and integration indicators developed for the Atlanta metropolitan area. In some cases a decrease in deployment or integration over time occurs. This may be due to differences in reporting from year to year, agencies responding one year and not the other, or an actual decrease in the level of deployment. The figures summarizing the component indicators consist of a bar chart portraying the deployment levels for 1997, 1999, 2000, 2002, 2004, and 2005 estimates.

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  $(10\%+0\%+5\%)/3 = 5\%$ .

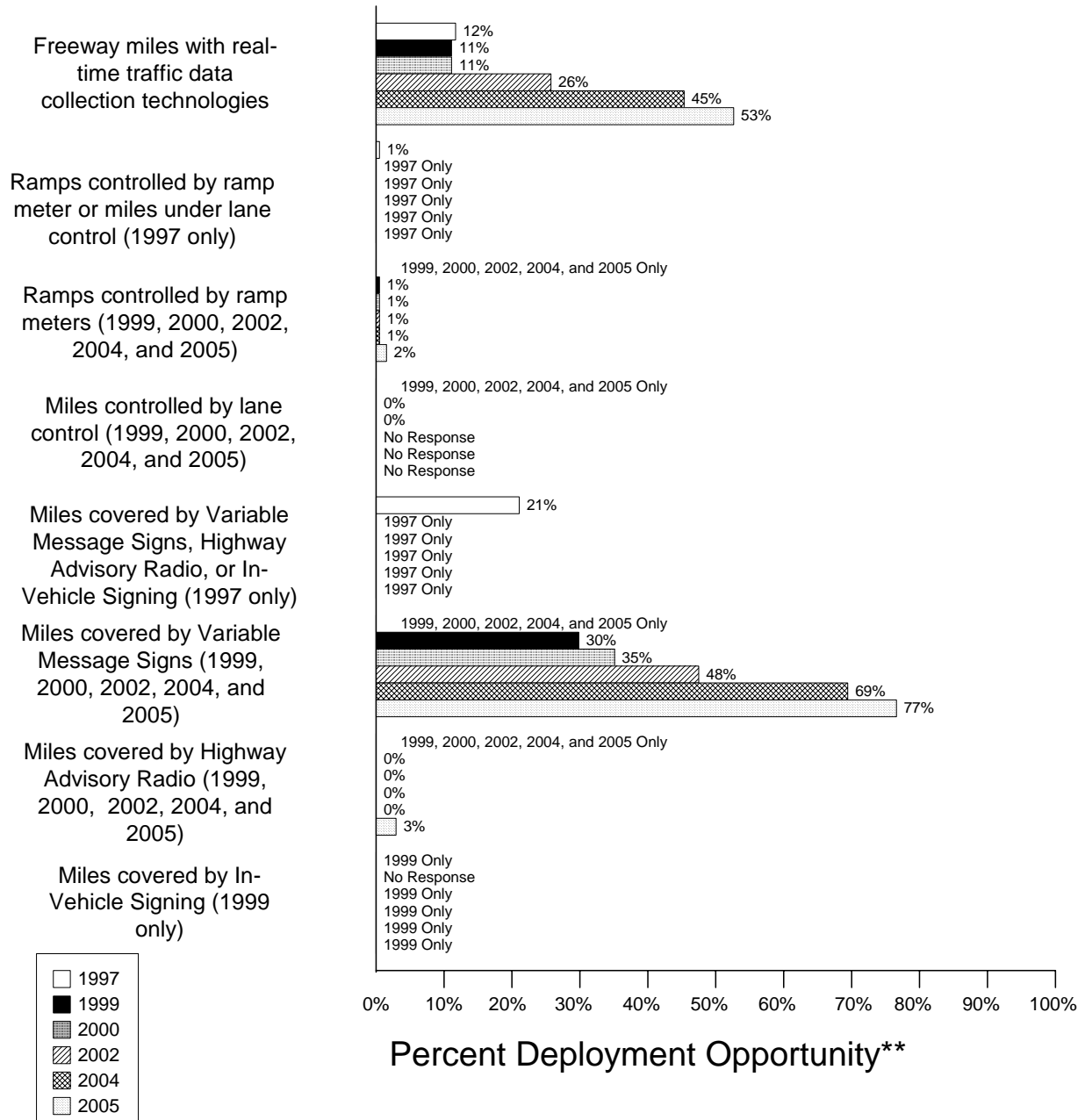
The figures summarizing the integration indicators consist of a diagram for each of the nine metropolitan ITS components portraying the integration level for 2004. Each diagram portrays the proportion of agencies providing information to a component (e.g., the flow of incident information from Incident 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 Components

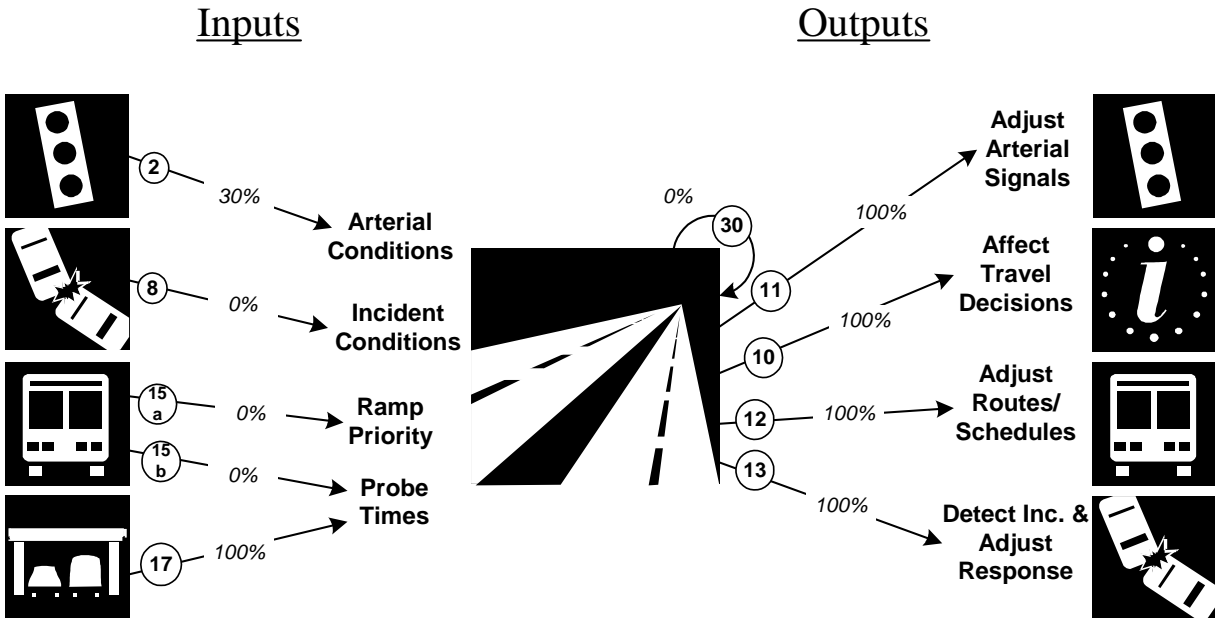
## Atlanta Freeway Management\*



\* 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.

# Freeway Management Integration

## Atlanta Freeway Management Integration\*

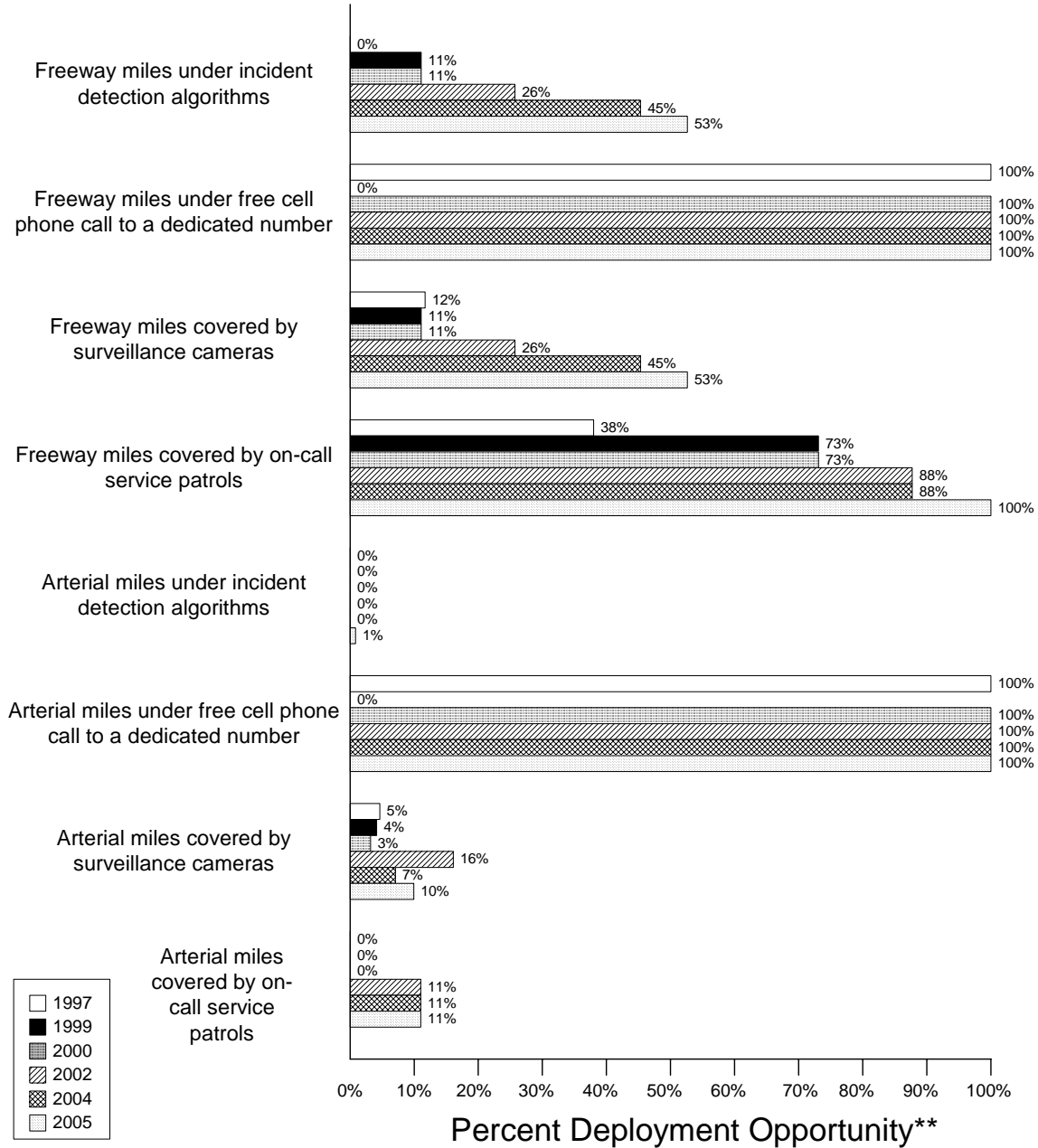


\* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.

# Freeway and Arterial Incident Management Components

## Atlanta

### Freeway and Arterial Incident Management\*

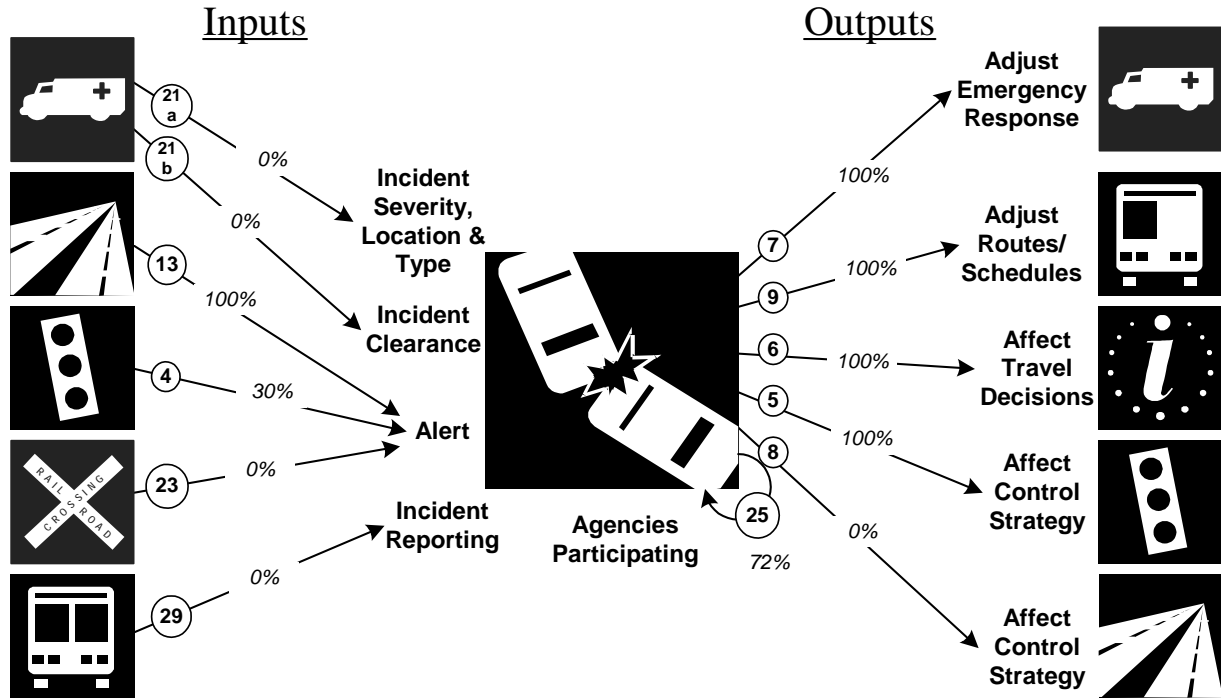


\* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.

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

# Incident Management Integration

## Atlanta Incident Management Integration\*

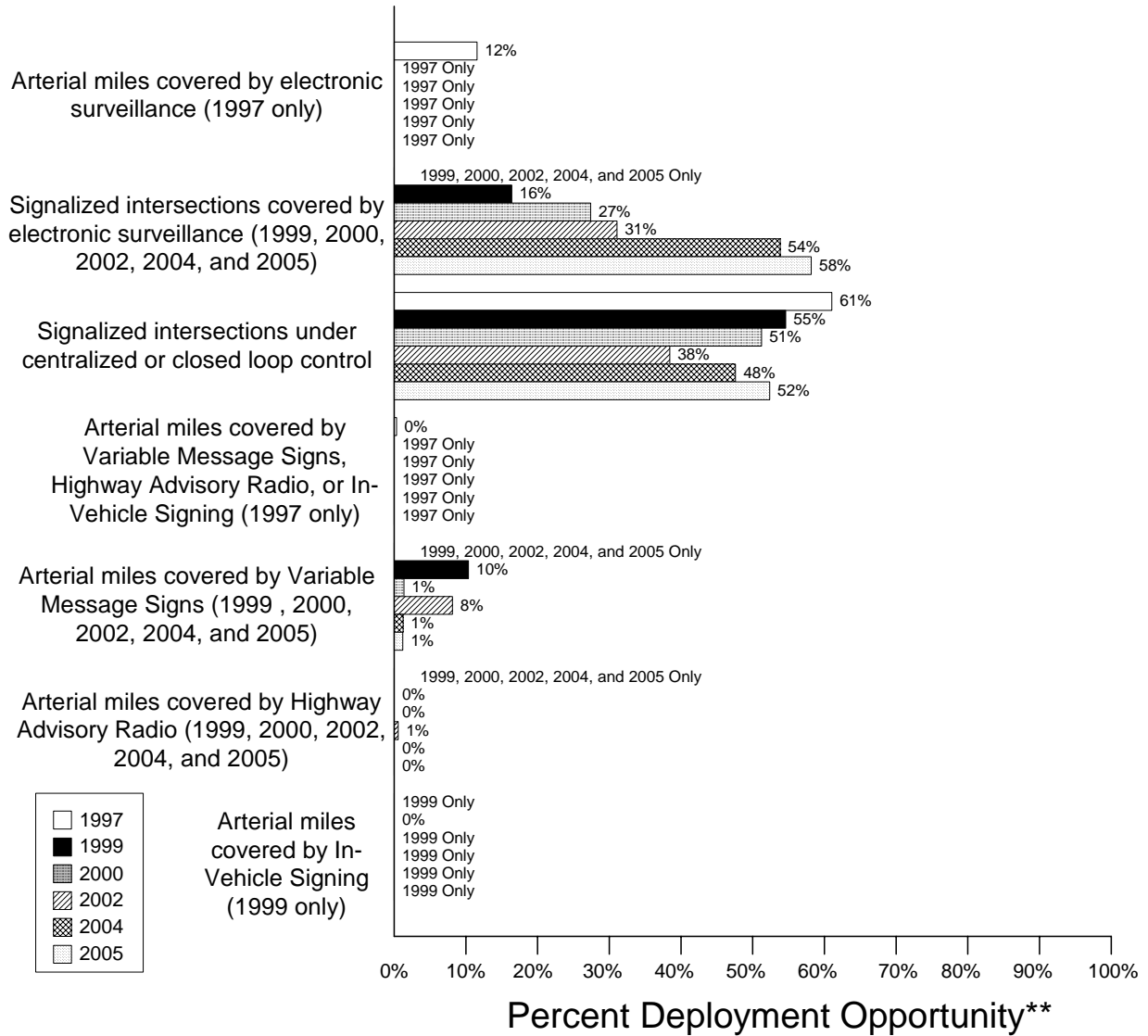


\* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.

# Arterial Management Components

## Atlanta

### Arterial Management\*

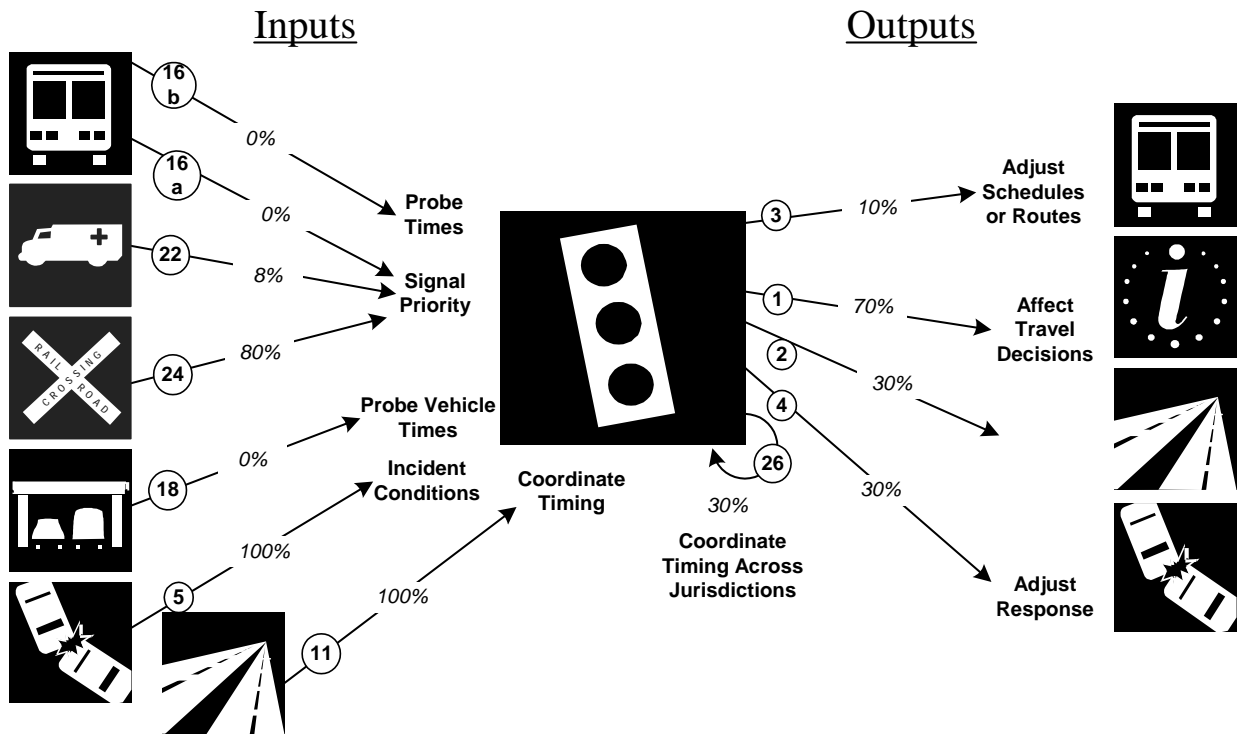


\* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.  
 \*\* Deployment opportunity reflects potential totals that do not necessarily reflect actual need.

# Arterial Management Integration

## Atlanta

### Arterial Management Integration\*

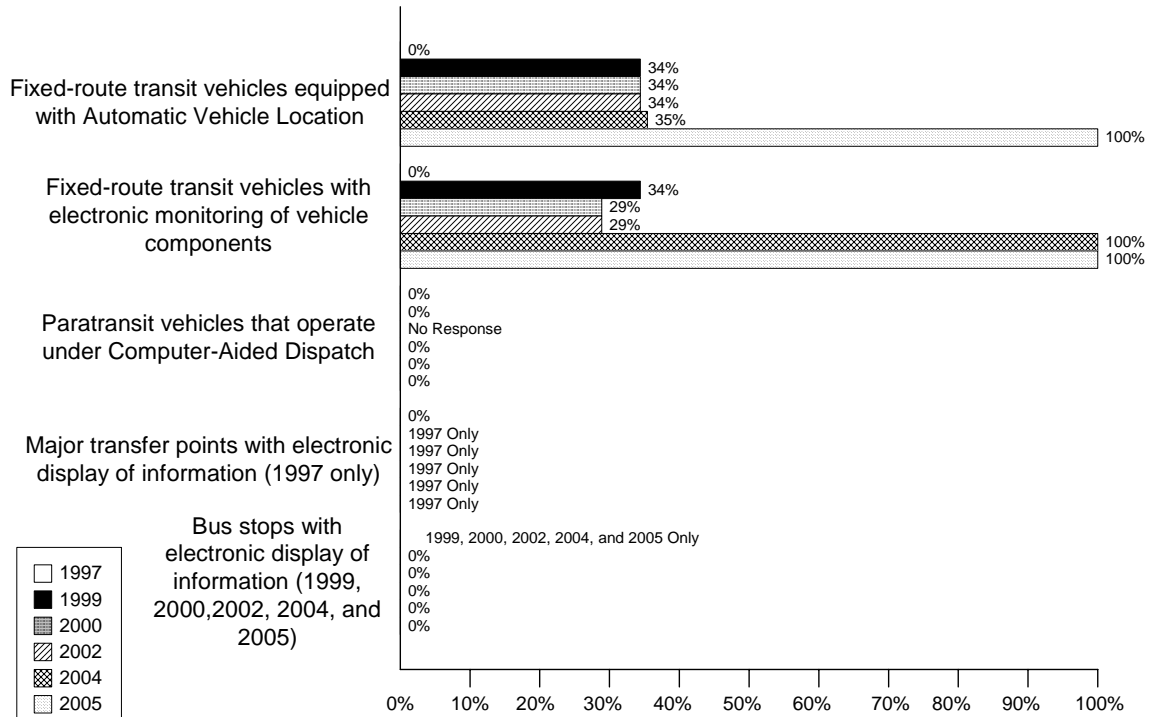


\* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.

# Transit Management Components

## Atlanta

### Transit Management\*



### Percent Deployment Opportunity\*\*

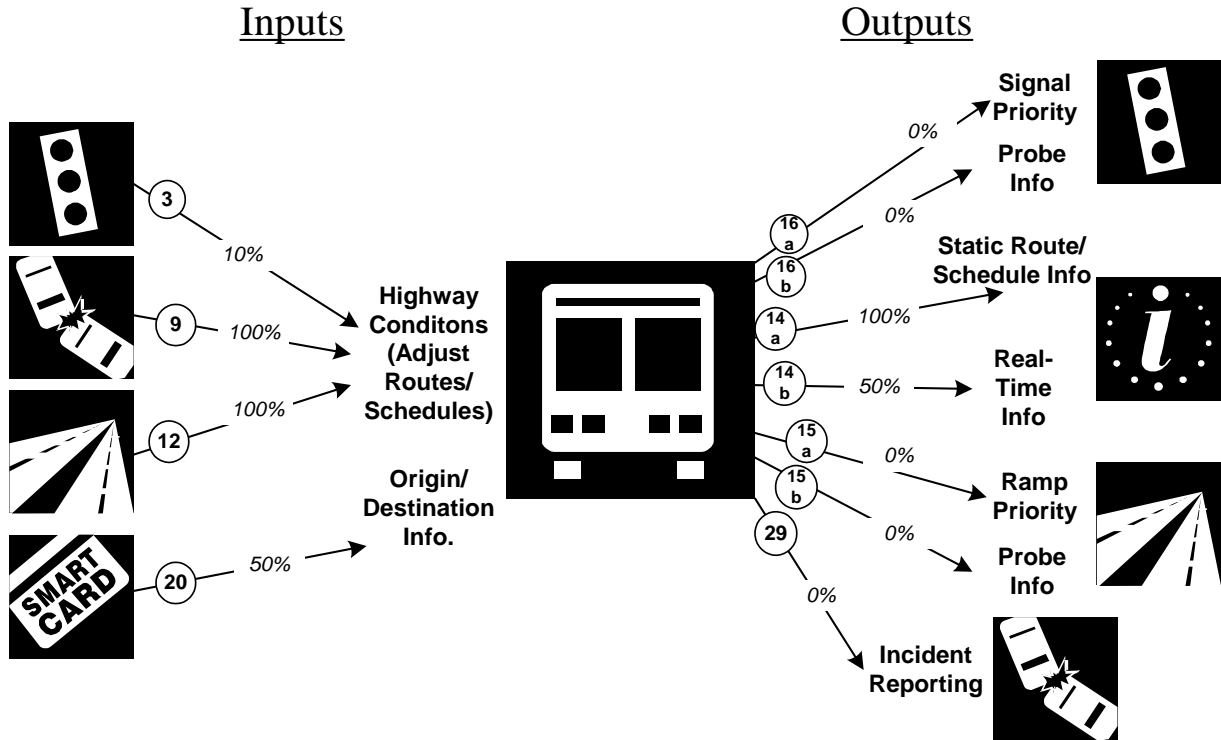
\* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.  
 \*\* Deployment opportunity reflects potential totals that do not necessarily reflect actual need.



# Transit Management Integration

## Atlanta

### Transit Management Integration\*

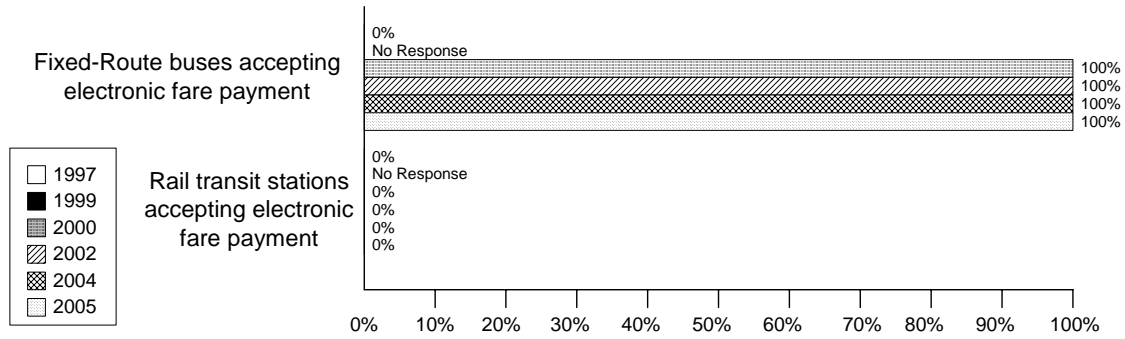


\* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.

# Electronic Fare Payment Components

Atlanta

## Electronic Fare Payment\*



## Percent Deployment Opportunity\*\*

\* 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.

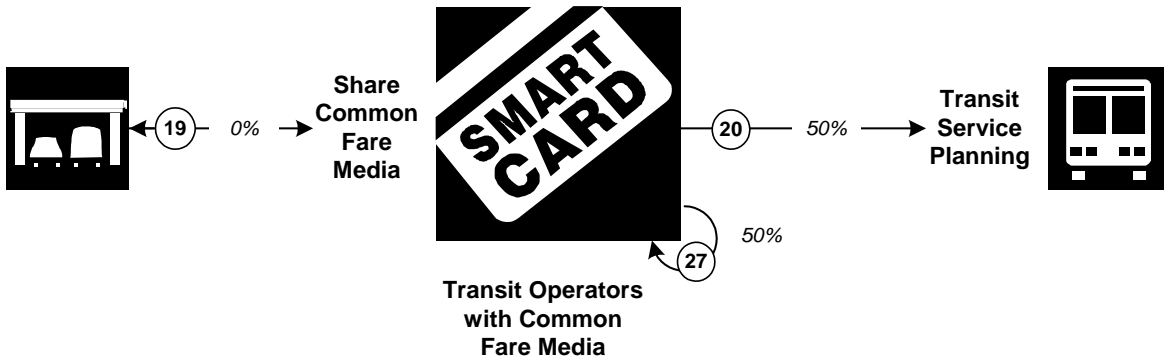
# Electronic Fare Payment Integration

## Atlanta

### Electronic Fare Payment Integration\*

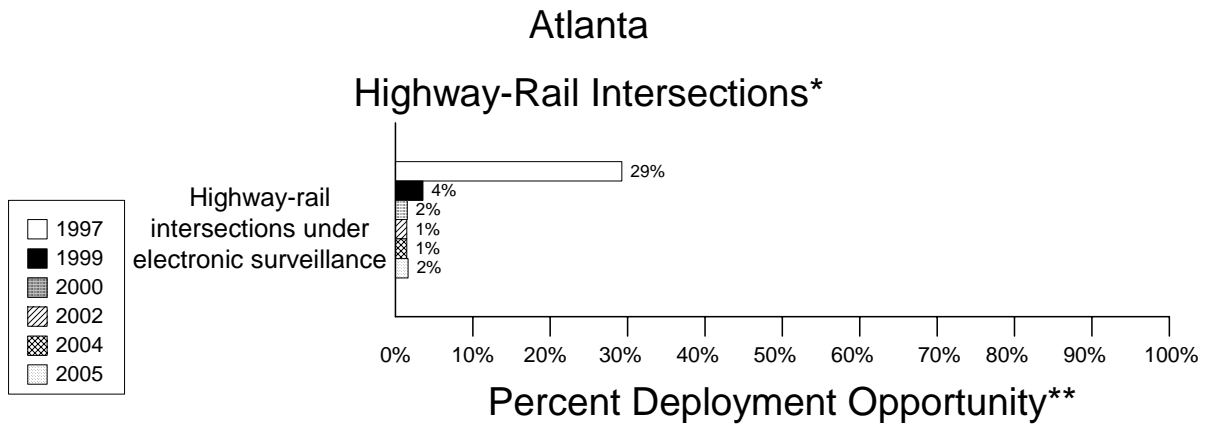
Inputs

Outputs



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

## Highway-Rail Intersections Components



\* 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.

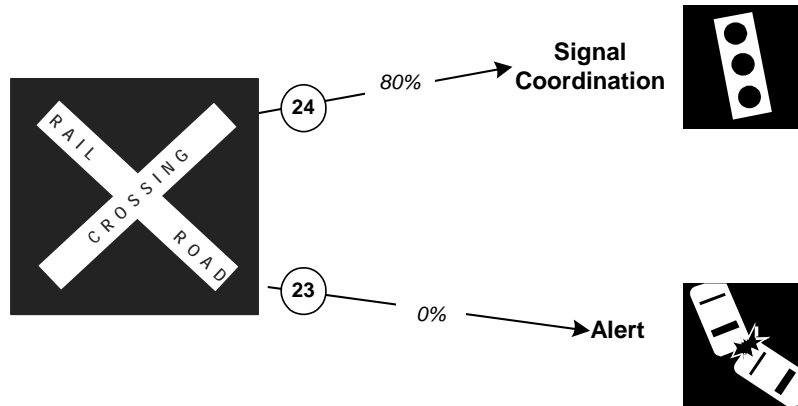
# Highway-Rail Intersections Integration

## Atlanta

### Highway-Rail Intersections Integration\*

Inputs

Outputs

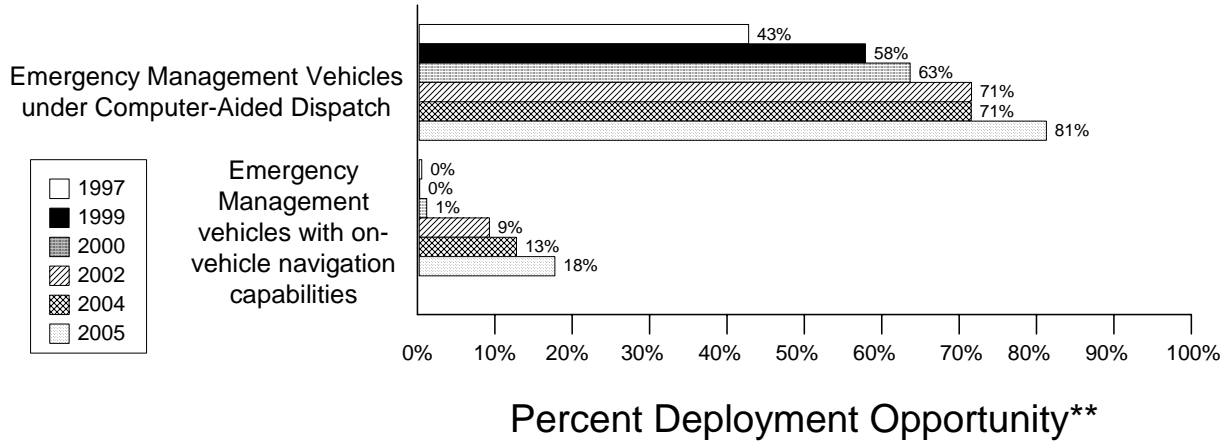


\* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.

## Emergency Management Components

Atlanta

### Emergency Management\*



\* 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.

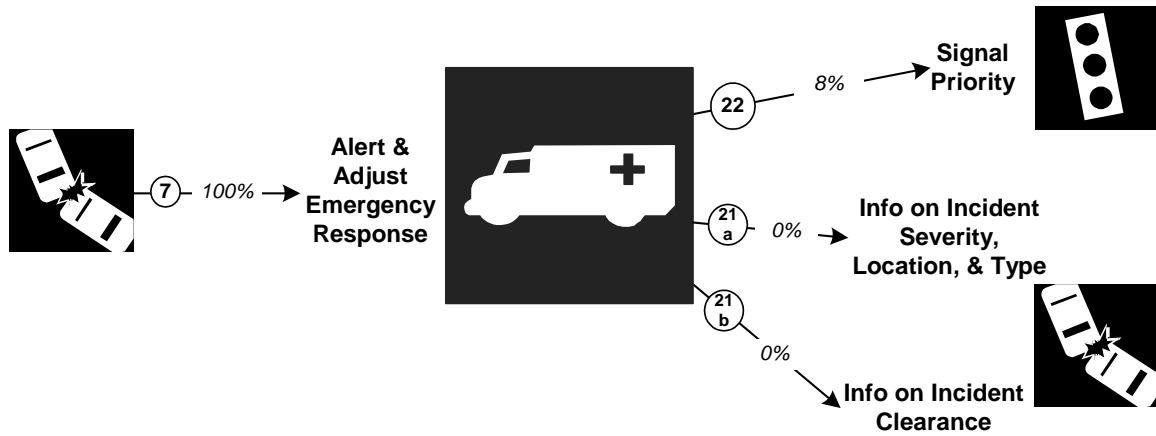
# Emergency Management Integration

## Atlanta

### Emergency Management Integration\*

Inputs

Outputs

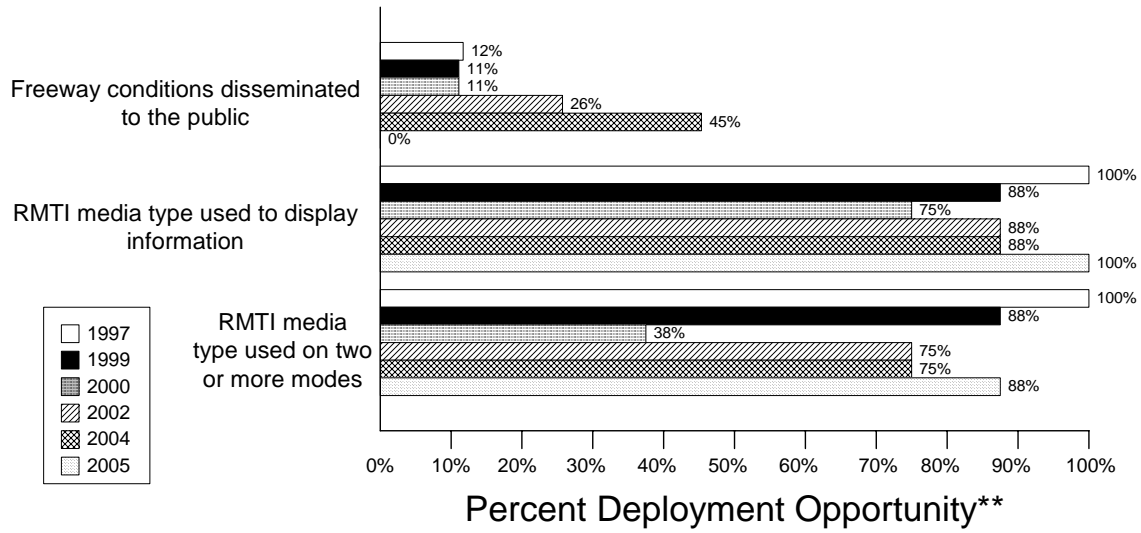


\* Indicators are single surrogates that do not necessarily reflect the full breadth of ITS deployment activity.

# Regional Multimodal Traveler Information Components

## Atlanta

### Regional Multimodal Traveler Information\*



\* 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.



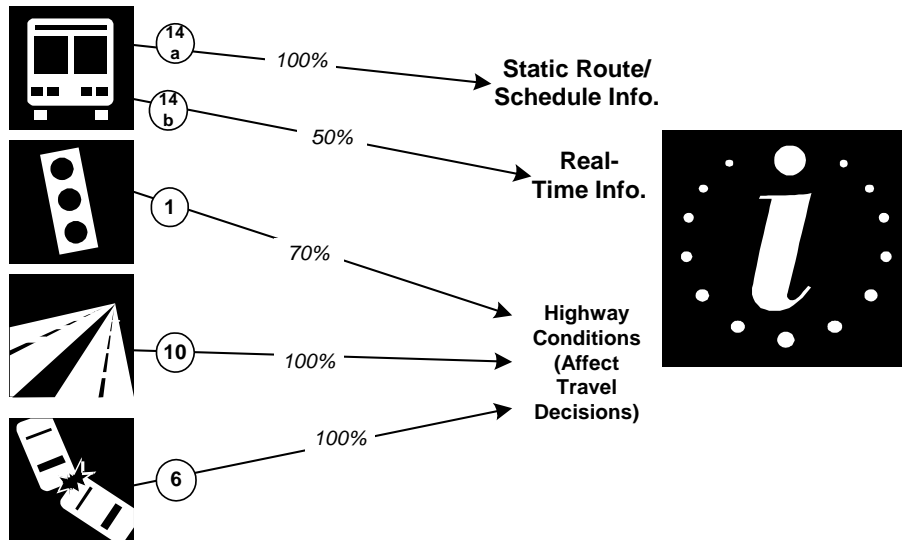
# Regional Multimodal Traveler Information Integration

## Atlanta

### Regional Multimodal Traveler Information Integration\*

#### Inputs

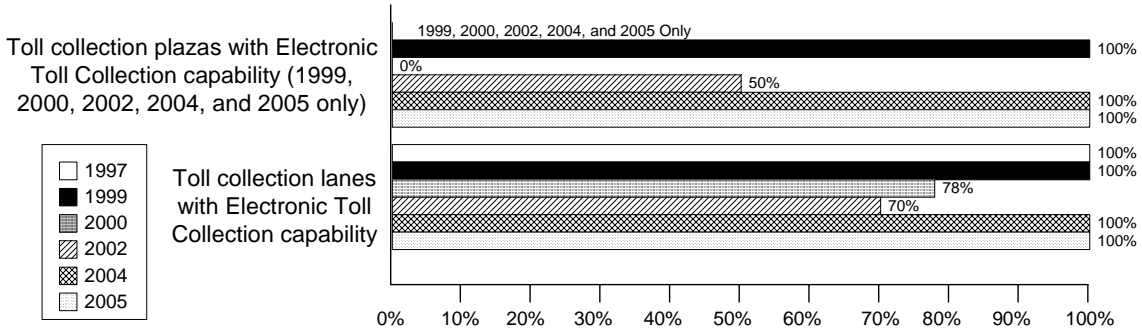
#### Outputs



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

# Electronic Toll Collection Components

## Atlanta Electronic Toll Collection\*



### Percent Deployment Opportunity\*\*

\* 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.

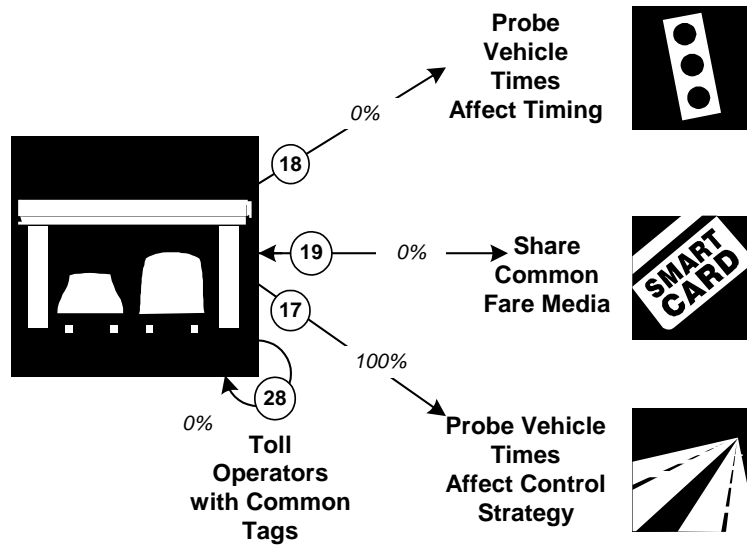
# Electronic Toll Collection Integration

## Atlanta

### Electronic Toll Collection Integration\*

#### Inputs

#### Outputs



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

## Appendix A. Component Indicators

### Freeway Management Component Indicators

Description	1997	1999	2000	2002	2004	2005
Freeway centerline miles are under electronic surveillance for monitoring traffic flow	12%	11%	11%	26%	45%	53%
Freeway entrance ramps are controlled by ramp meters or miles under lane control	1%					
Freeway entrance ramps are controlled by ramp meters		1%	1%	1%	1%	2%
Freeway centerline miles will be controlled by lane control		0%	0%	NR	NR	NR
Freeway miles are covered by VMS, HAR, or In-Vehicle Signing (IVS)	21%					
Freeway miles are covered by VMS		30%	35%	48%	69%	77%
Freeway miles are covered by HAR		0%	0%	0%	0%	3%
Freeway miles are covered by IVS		NR				

### Incident Management Component Indicators

Description	1997	1999	2000	2002	2004	2005
Freeway miles covered by incident detection algorithms	0%	11%	11%	26%	45%	53%
Freeway miles covered by free cellular phone calls to a dedicated number	100%	0%	100%	100%	100%	100%
Freeway miles covered by surveillance cameras	12%	11%	11%	26%	45%	53%
Freeway miles covered by on-call publicly sponsored service patrol or towing services	38%	73%	73%	88%	88%	100%
Arterial miles covered by incident detection algorithms	0%	0%	0%	0%	0%	1%
Arterial miles covered by free cellular phone calls to a dedicated number	100%	0%	100%	100%	100%	100%
Arterial miles covered by surveillance cameras	5%	4%	3%	16%	7%	10%
Arterial miles covered by on-call publicly-sponsored service patrol or towing services	0%	0%	0%	11%	11%	11%

### Arterial Management Component Indicators

<b>Description</b>	<b>1997</b>	<b>1999</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>	<b>2005</b>
Arterial miles covered by electronic surveillance	12%					
Signalized intersections are covered by electronic surveillance for monitoring traffic flow		16%	27%	31%	54%	58%
Signalized intersections are under centralized or closed loop control	61%	55%	51%	38%	48%	52%
Arterial miles are covered by VMS, HAR, or IVS	0%					
Arterial miles are covered by VMS		10%	1%	8%	1%	1%
Arterial miles are covered by HAR		0%	0%	1%	0%	0%
Arterial miles are covered by IVS		0%				

### **Electronic Toll Collection Component Indicators**

<b>Description</b>	<b>1997</b>	<b>1999</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>	<b>2005</b>
Toll collection plazas with ETC capability		100%	0%	50%	100%	100%
Toll collection lanes with ETC capability	100%	100%	78%	70%	100%	100%

### Transit Management Component Indicators

Description	1997	1999	2000	2002	2004	2005
Fixed-route transit vehicles are equipped with Automatic Vehicle Location (AVL)	0%	34%	34%	34%	35%	100%
Fixed-route transit vehicles are equipped with electronic monitoring of vehicle component	0%	34%	29%	29%	100%	100%
Paratransit vehicles operate under computer-aided dispatch	0%	0%	NR	0%	0%	0%
Percent fixed-route transfer locations with electronic display of information	0%					
Bus stops display information to the public		0%	0%	0%	0%	0%

### Electronic Fare Payment Component Indicators

Description	1997	1999	2000	2002	2004	2005
Fixed-route transit vehicles that accept electronic payment	0%	NR	100%	100%	100%	100%
Rail transit stations that accept electronic payment	0%	NR	0%	0%	0%	0%

### Highway Rail Intersection Component Indicators

Description	1997	1999	2000	2002	2004	2005
Highway-rail intersections are under electronic surveillance	29%	4%	2%	1%	1%	2%

### Emergency Management Component Indicators

Description	1997	1999	2000	2002	2004	2005
Public sector emergency vehicles that operate under computer-aided dispatch	43%	58%	63%	71%	71%	81%
Public sector emergency vehicles that have in-vehicle route guidance capability	0%	0%	1%	9%	13%	18%

### Regional Multimodal Traveler Information (RMTI) Component Indicators

Description	1997	1999	2000	2002	2004	2005
Freeway conditions disseminated to travelers	12%	11%	11%	26%	45%	0%
Possible RMTI media types are used to display information to travelers	100%	88%	75%	88%	88%	100%

<b>Description</b>	<b>1997</b>	<b>1999</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>	<b>2005</b>
Possible RMTI media are used to display information on <i>two or more modes</i> to travelers	100%	88%	38%	75%	75%	88%

## Appendix B. Integration Indicators

IndicatorsLink Description	1999	2000	2002	2004
1. Arterial Management agencies disseminate arterial travel times, speeds, and conditions to the public	44%	38%	50%	70%
2. Arterial Management agencies sending information to Freeway Management	44%	50%	40%	30%
3. Arterial Management agencies transfer arterial travel times, speeds, and conditions to Transit Management	11%	13%	20%	10%
4. Arterial Management agencies sending arterial conditions to Incident Management	22%	38%	40%	30%
5. Incident Management agencies transfer information describing incident severity, location, and type to Arterial Management agencies	100%	100%	100%	100%
6. Incident Management agencies disseminate information describing incident severity, location, and type to the public	100%	100%	100%	100%
7. Incident management agencies transfer information describing incident severity, location, and type to Emergency Management agencies	100%	100%	100%	100%
8. Incident Management agencies sending information describing incident severity, location, and type to Freeway Management agencies	0%	0%	0%	0%
9. Incident Management agencies transfer information describing incident severity, location, and type to Transit Management agencies	100%	100%	100%	100%
10. Freeway Management agencies disseminating freeway conditions to the public	100%	100%	100%	100%
11. Freeway Management agencies sending information to Arterial Management	100%	100%	100%	100%
12. Freeway Management agencies sending freeway conditions to Transit Management	100%	100%	100%	100%
13. Freeway Management agencies sending freeway conditions to Incident Management	100%	100%	100%	100%
14a. Transit Management agencies disseminate information describing transit routes, schedules, and fares to travelers	100%	100%	100%	100%
14b. Transit Management agencies disseminate information describing schedule/route adherence to travelers	50%	0%	50%	50%
15a. Transit management agencies with vehicles equipped with ramp meter priority	0%	0%	0%	0%
15b. Transit Management agencies with vehicles equipped as probes	0%	0%	0%	0%



<b>IndicatorsLink Description</b>	<b>1999</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>
16a. Transit management agencies with vehicles equipped with traffic signal priority	0%	50%	50%	0%
16b. Transit Management agencies have vehicles equipped as probes on arterials	0%	0%	0%	0%
17. Freeway Management agencies receiving freeway conditions from vehicle probes	100%	0%	0%	100%
18. Number of Arterial Management agencies receiving information from vehicle probes	11%	0%	0%	0%
19. Transit agencies that accept electronic payment through the use of electronic toll collection media	0%	0%	0%	0%
20. Transit Management agencies using Electronic Fare Payment data in transit service planning	50%	50%	50%	50%
21a. Incident management agencies receiving incident severity from Emergency Management	100%	0%	0%	0%
21b. Incident management agencies receiving incident clearance activities from Emergency Management	100%	0%	0%	0%
22. Emergency Management agencies have vehicles equipped with traffic signal preemption capability	8%	12%	11%	8%
23. Arterial Management agencies receive information on highway-rail intersection crossing blockages for the purpose of managing incident response	0%	0%	0%	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	67%	88%	80%	80%
25. Police, fire, and EMS agencies participating in a formal incident management plan/team	59%	50%	71%	72%
26. Arterial Management agencies under cooperative agreement to share traffic signal timing for coordinated response	56%	25%	20%	30%
27. Transit Management agencies that use the same electronic payment system	50%	0%	0%	50%
28. Toll operators using common toll tag technology	100%	0%	0%	0%
29. Transit Management agencies report traffic incidents as part of an organized regional incident management program	50%	50%	50%	0%
30. Freeway Management agencies sending information to another Freeway Management agency	0%	0%	0%	0%

## Appendix C. Surveyed Agencies

### Atlanta

Agency Name	1997		1999		2000		2002		2004	
	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>
<b>Arterial Management</b>										
Atlanta City	7/23/1997	10/21/1997	7/30/1999	12/17/1999	7/20/2000		5/16/2002	9/23/2002	6/14/2004	7/14/2004
Cherokee County			7/30/1999	10/15/1999	7/20/2000	9/27/2000	5/16/2002	6/25/2002	6/14/2004	7/13/2004
Clayton County	7/23/1997	9/9/1997	7/30/1999	8/13/1999	7/20/2000	8/28/2000	5/16/2002	8/30/2002	6/14/2004	8/2/2004
Cobb County	7/23/1997	9/9/1997	7/30/1999	8/16/1999	7/18/2000	8/31/2000	5/16/2002	8/29/2002	6/14/2004	9/2/2004
DeKalb County	7/23/1997	8/26/1997	7/30/1999		7/19/2000		5/31/2002	8/29/2002	6/14/2004	9/2/2004
Douglas County	7/23/1997									
Fulton County	9/16/1997	11/24/1997	7/30/1999	10/21/1999	7/18/2000	1/24/2001	5/16/2002		6/14/2004	8/10/2004
Georgia Department of	7/23/1997	9/23/1997	7/30/1999	12/28/1999	7/18/2000	11/2/2000	5/16/2002	9/24/2002	7/7/2004	8/9/2004
Gwinnett County	7/23/1997	9/23/1997	7/30/1999	10/21/1999	7/18/2000	11/16/2000	5/16/2002	8/19/2002	6/14/2004	9/2/2004
Henry County	7/23/1997		7/30/1999	10/22/1999	7/18/2000	11/6/2000	5/16/2002	8/8/2002	6/14/2004	7/13/2004
Rockdale County	7/23/1997		7/30/1999		7/18/2000	10/2/2000	5/16/2002	5/31/2002	6/14/2004	7/19/2004
<b>Electronic Toll Collection</b>										
State Road and Tollway Authority (Georgia)			6/30/1999	7/8/1999	6/21/2000	11/8/2000	5/29/2002	7/10/2002	5/17/2004	6/9/2004

Agency Name	1997		1999		2000		2002		2004	
	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>
<b>Emergency Management</b>										
Atlanta City Fire Department	7/25/1997	5/20/1998	7/23/1999	8/19/1999	6/23/2000		4/24/2002	6/11/2002	5/17/2004	7/8/2004
Atlanta City Fire Department (Emergency Medical)			7/23/1999	8/19/1999	6/23/2000	7/10/2000	4/24/2002	6/11/2002	5/17/2004	7/8/2004
Atlanta City Police Department	7/28/1997	8/4/1997	6/2/1999	9/2/1999	6/23/2000	10/3/2000	5/6/2002	6/27/2002	5/17/2004	7/5/2004
Cherokee County Sheriff's	7/24/1997	5/13/1998	6/2/1999	6/3/1999	6/23/2000	10/3/2000	5/15/2002	8/2/2002	5/17/2004	5/24/2004
Clayton County Fire Department	7/24/1997	5/14/1998	6/2/1999	6/8/1999	6/23/2000	7/13/2000	4/24/2002	4/26/2002		
Clayton County Police Department	7/26/1997	6/17/1998	6/2/1999	6/2/1999	6/23/2000	7/5/2000	4/26/2002	8/1/2002	5/17/2004	7/8/2004
Cobb County Fire Department	7/25/1997	5/14/1998	6/2/1999	8/16/1999	6/23/2000	7/10/2000	4/30/2002	6/7/2002		
Cobb County Police Department	7/25/1997	7/28/1997	6/2/1999	7/23/1999	6/23/2000	7/12/2000	5/17/2002	6/13/2002	5/17/2004	7/20/2004
Cobb County Public Safety	7/25/1997	8/7/1997								
Decatur City Fire Department	7/25/1997	8/6/1997	6/2/1999	6/11/1999	6/23/2000	7/10/2000	4/24/2002	4/24/2002	5/17/2004	6/11/2004
Decatur City Police Department			6/2/1999	6/11/1999	6/23/2000	7/10/2000	4/24/2002	4/24/2002	5/17/2004	
DeKalb County Emergency Management Agency			6/1/1999	6/2/1999	6/23/2000	10/5/2000	4/24/2002	6/10/2002		
DeKalb County Emergency Medical Services			6/1/1999	6/2/1999	6/23/2000	10/5/2000	4/24/2002	6/10/2002		
DeKalb County Fire Department			6/1/1999	6/2/1999	6/23/2000	10/5/2000	4/24/2002	6/10/2002		
DeKalb County Police Department			6/1/1999	6/2/1999	6/23/2000	10/5/2000	4/24/2002	6/10/2002	5/17/2004	8/6/2004
DeKalb County Public Safety	7/24/1997	7/25/1997								
DeKalb County Sheriff Office			6/1/1999	6/2/1999	6/23/2000	10/5/2000	4/24/2002	6/10/2002	5/17/2004	
Douglas County Fire Department	7/24/1997	5/13/1998	6/2/1999	6/2/1999	6/23/2000	1/8/2001	4/24/2002	6/26/2002		
Douglas County Sheriff Department	7/24/1997	5/14/1998	6/2/1999	6/2/1999	6/23/2000	7/7/2000	4/26/2002	6/14/2002	5/17/2004	6/23/2004
East Point City Fire Department	7/25/1997	8/7/1997	6/3/1999	6/9/1999	6/23/2000	1/8/2001	4/24/2002	5/8/2002	5/17/2004	6/25/2004
East Point City Police Department	7/24/1997	8/7/1997	6/2/1999	6/11/1999	6/23/2000	9/1/2000	5/31/2002	6/19/2002	5/17/2004	7/20/2004
Fayette County Sheriffs Department	7/25/1997	5/14/1998	6/2/1999	9/3/1999	6/23/2000	10/10/2000	4/26/2002	6/19/2002	5/17/2004	7/1/2004
Fulton County Fire Department	7/24/1997	7/29/1997	6/2/1999	6/3/1999	6/23/2000	7/3/2000	4/24/2002	8/5/2002		
Fulton County Police Department	7/24/1997	7/14/1998								
Fulton County Sheriff Department			6/2/1999	8/25/1999	6/23/2000	8/4/2000	4/26/2002	9/18/2002	5/17/2004	7/28/2004
Georgia Emergency Management Agency (GEMA)	7/25/1997	7/29/1997	6/2/1999	6/7/1999	6/23/2000	1/16/2001	4/24/2002	6/10/2002	5/17/2004	8/5/2004
Gwinette County Emergency Medical & Hazmat			5/26/1999	6/1/1999						
Gwinette County Water Rescue			5/24/1999	6/1/1999						

Agency Name	1997		1999		2000		2002		2004	
	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>	<u>Date Out</u>	<u>Date In</u>
Gwinnett County Fire & EMS Department	7/25/1997	5/14/1998	6/2/1999	6/10/1999	6/23/2000	7/24/2000	4/24/2002	6/13/2002		
Gwinnett County Police Department	7/25/1997	7/29/1997	6/2/1999	8/30/1999	6/23/2000	7/17/2000	4/26/2002	6/20/2002	5/17/2004	6/4/2004
Henry County Police Department	7/25/1997	5/18/1998	6/2/1999	6/10/1999	6/23/2000	6/29/2000	4/26/2002	8/12/2002	5/17/2004	6/24/2004
Marietta City Fire Department	7/24/1997	5/14/1998	6/2/1999	6/4/1999	6/23/2000	10/6/2000	4/24/2002	6/27/2002	5/17/2004	6/17/2004
Marietta City Police Department	7/24/1997	7/14/1998	6/2/1999	7/26/1999	6/23/2000	10/4/2000	4/26/2002	8/6/2002	5/17/2004	7/23/2004
Rockdale County Fire Department	7/24/1997	9/15/1997	6/2/1999	6/2/1999	6/23/2000	9/11/2000	4/24/2002	6/27/2002		
Rockdale County Sheriffs	7/24/1997	7/29/1997	6/2/1999	6/10/1999	6/23/2000	1/11/2001	4/26/2002	8/30/2002	5/17/2004	7/7/2004
Roswell City Fire & Rescue	7/25/1997	7/31/1997	6/3/1999	6/3/1999	6/23/2000	7/3/2000	4/24/2002	4/24/2002	5/17/2004	6/17/2004
Roswell City Police Department	7/24/1997	7/13/1998	6/2/1999	7/28/1999	6/23/2000	1/8/2001	6/6/2002	8/1/2002	5/17/2004	6/19/2004
Smyrna City Fire Department	7/24/1997	7/25/1997	6/2/1999	6/2/1999	6/23/2000	7/13/2000	4/24/2002	7/22/2002	5/17/2004	7/22/2004
Smyrna City Police Department	7/24/1997	7/28/1997	6/2/1999	6/3/1999	6/23/2000	7/3/2000	5/20/2002	6/14/2002	5/17/2004	8/3/2004
Union City Fire Department	7/24/1997	8/5/1997	6/2/1999	6/8/1999	6/23/2000	12/27/2000	4/24/2002	4/29/2002	5/17/2004	6/24/2004
<b>Freeway Management</b>										
Georgia Department of	7/23/1997	9/9/1997	7/29/1999	10/18/1999	7/10/2000	7/24/2000	6/3/2002	6/3/2002	7/7/2004	7/22/2004
<b>MPO</b>										
Atlanta Regional Commission	Not Surveyed in 1997		7/15/1999	7/28/1999	6/19/2000	6/30/2000	Not Surveyed in 2002		6/1/2004	6/2/2004
<b>Transit Management</b>										
Douglas County Rideshare	7/21/1997	8/5/1997	8/9/1999	10/23/1999	8/1/2000	8/15/2000	5/16/2002	5/16/2002	6/1/2004	6/1/2004
Metropolitan Atlanta Rapid Transit Authority MARTA			8/18/1999	11/10/1999	8/1/2000	12/27/2000	5/16/2002	9/20/2002	6/1/2004	8/13/2004

To access an electronic version of this publication visit  
the ITS Deployment Tracking Web Site:  
<http://www.itsdeployment.its.dot.gov/>

Visit our ITS WEB site  
ITS Joint Program office:  
<http://www.its.dot.gov>