Private Sector Perceptions and Public Sector Activities

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Motivation

- Determine the nature and extent of the data gap:
  - Private sector needs
  - Public & private sector data availability
- National context to inform potential solutions

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Data Sources

- Two surveys:
  - Private sector ISPs
  - Public sector agencies in largest metro areas
- Additional data:
  - 1998 Highway Statistics
  - Review of web sites
  - IBTTA

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Public Sector Survey

- For 1999 metropolitan ITS deployment tracking--not specifically ATIS
- Asked about responsibilities, technology use and operations
- Freeway, arterial, toll and transit agencies in 78 largest metropolitan areas
- Preliminary data

Public Sector Survey Response

Table 1. Response to the public sector survey

Survey	# of respondents	Response rate	# of metro areas represented
Arterial	336	69%	72
Freeway	93	76%	63
Transit	162	79%	62

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Private Sector Survey

- For this workshop
- Asked about business, experience with data availability & quality
- 20 respondents from 9 companies
- Included open-ended questions about potential explanations of problems and solutions

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Private Sector Respondents

- All process data and sell info to end users
- Most common customers:
  - Private travelers
  - Commercial highway users
  - Other companies
  - Public sector
- Variation in dissemination media, but websites most common

Information Priorities

- Private sector
  - Importance to business
- Public sector
  - Importance of making available to public
    - Not necessarily their priorities for collection
    - Public not necessarily ATIS

Private Sector Data Priorities

- Traffic speeds
- Incidents
- Road conditions
- Current and scheduled work zones
- Weather conditions

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Public Sector Data Priorities: Freeway Agencies

- Current and scheduled work zones
- Incidents
- Road conditions
- Emergency/evacuation routes and procedures
- Weather conditions

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Public Sector Data Priorities: Arterial Agencies

- Current and scheduled work zones
- Incidents
- Route designations
- Emergency/evacuation routes and procedures
- Road conditions

Public Sector Data Priorities: Transit Agencies

- Vehicle time and location most important
- In general rank information that affects customer service ahead of planning or management information

Points to Note on Priorities

- Mismatch between public and private sector--worse for arterial than freeway agencies
- Transit agencies more interested than ISPs in providing transit info to public
- ISPs' rankings reflect particular transportation system conditions in each metro area

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Traffic Data Collection
General Characteristics

- Private sector data collection, especially of high priority data
- Less collection of information on incidents than would be expected based on priorities
- Inconsistent collection across metro areas resulting from multiple agencies making decisions independently
- Moderate amounts of real-time data collection, with more in more congested areas

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Public Sector Data Collection

Table 2. 1999 data collection and archiving by freeway and arterial management agencies

	Freeway management agencies		Arterial management agencies	
Type of information	**Collect**	**Archive**	**Collect**	**Archive**
Traffic speeds	66%	44%	73%	57%
Incidents	71%	44%	45%	37%
Road conditions	69%	35%	39%	27%
Current work zones	84%	44%	64%	47%
Scheduled work zones	83%	47%	63%	45%
Weather conditions	69%	40%	28%	17%

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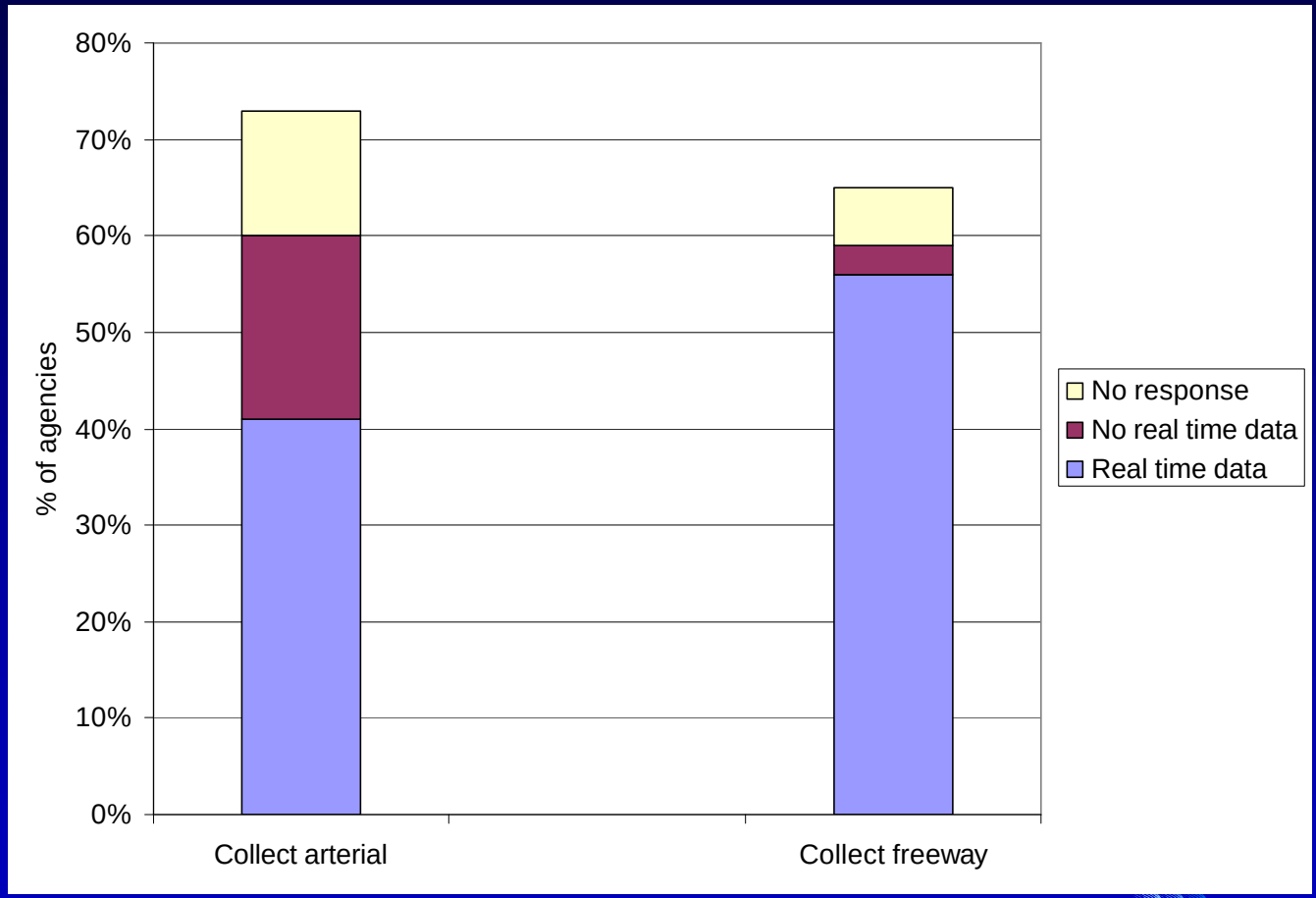
Public Sector Real-Time Collection of Traffic Speeds



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Most Common Data Quality Problems

- Inadequate geographic coverage
- Inaccurate information
- Insufficient update frequency
- Not timely enough
- Inadequate spatial resolution

Overall Observations on Traffic Data Quality

- ISP satisfaction with data depends on type of service they provide
- Some public agencies are consistently less accurate than others
- Incident and traffic speed data are the private sector high priority data with the lowest quality

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Traffic Data Collection on Freeways by Agencies with Real-Time Collection

Technology	% of agencies using	% of responsible agency's miles covered
Loop detectors	56	37
Microwave radar	28	18
Video imaging detectors	11	2
Probe readers	8	11
Other	17	18

Incident Data Collection on Freeways

Technology	% of agencies using	% of miles covered in each area
CCTV	71	31
Computer algorithms linked to traffic surveillance equipment	71	31
Police patrols	37	72
Free cellular phone call to a dedicated number other than 911	31	80
Private sector sources	10	22
Other	10	48

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Communication and Incident Data

- Some incident data quality problems may result from inadequate communication among responding agencies (inaccuracy, timeliness, update frequency)
- 42 of 71 responding freeway management agencies had a central focal point for facilitating 2-way flow of information about an incident.

Hours of Staffed Operation for FMCs

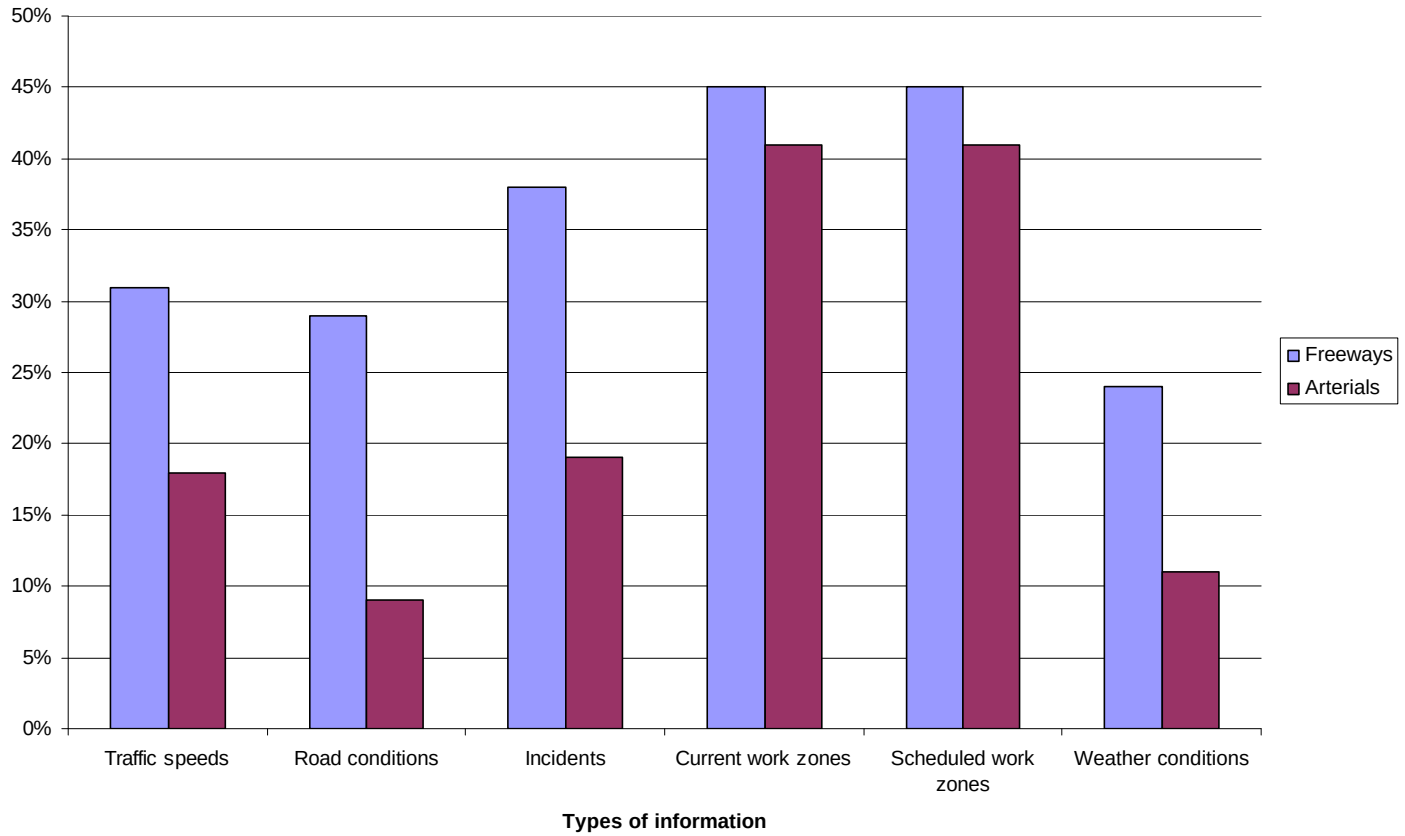
Hours of operation	Freeways (71 agencies)		Arterials (103 agencies)	
	% respondents reporting staffing	% with type of staffing exchange electronic data with other agencies	% respondents reporting staffing	% with type of staffing exchange electronic data with other agencies
Staffed 24 hours/day	38%	59%	7%	0%
Staffed peak hours	17%	33%	23%	21%
No response	45%	25%	70%	10%

Traffic Data Transfer and Dissemination

- One of the most common reasons for unavailability is that data is collected but not made available.
- Some public agencies do not share data with ISPs, possibly by policy.

Transfer of Private Sector Priority Information by Freeway and Arterial Agencies

Figure 2. 1999 Transfer of Information



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Public Agency Data Request Sources

	Freeway	Arterial
1	Media (i.e. TV stations, radio stations)	Consultants
2	State DOT personnel	State DOT personnel
3	Consultants	MPOs
4	MPOs	Media (i.e. TV stations, radio stations)
5	Universities	Universities

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Web Page Information Provision

Type of information	Post or provide to ISP to post		Frequency of updates
	# of sites	% of sites	
Incidents	27	87	Majority < 5 minutes or unspecified
Traffic speeds	8	31	Majority unspecified
Camera views (CCTV)	8	35	All either < 5 minutes or unspecified

Traffic Data Future Potential

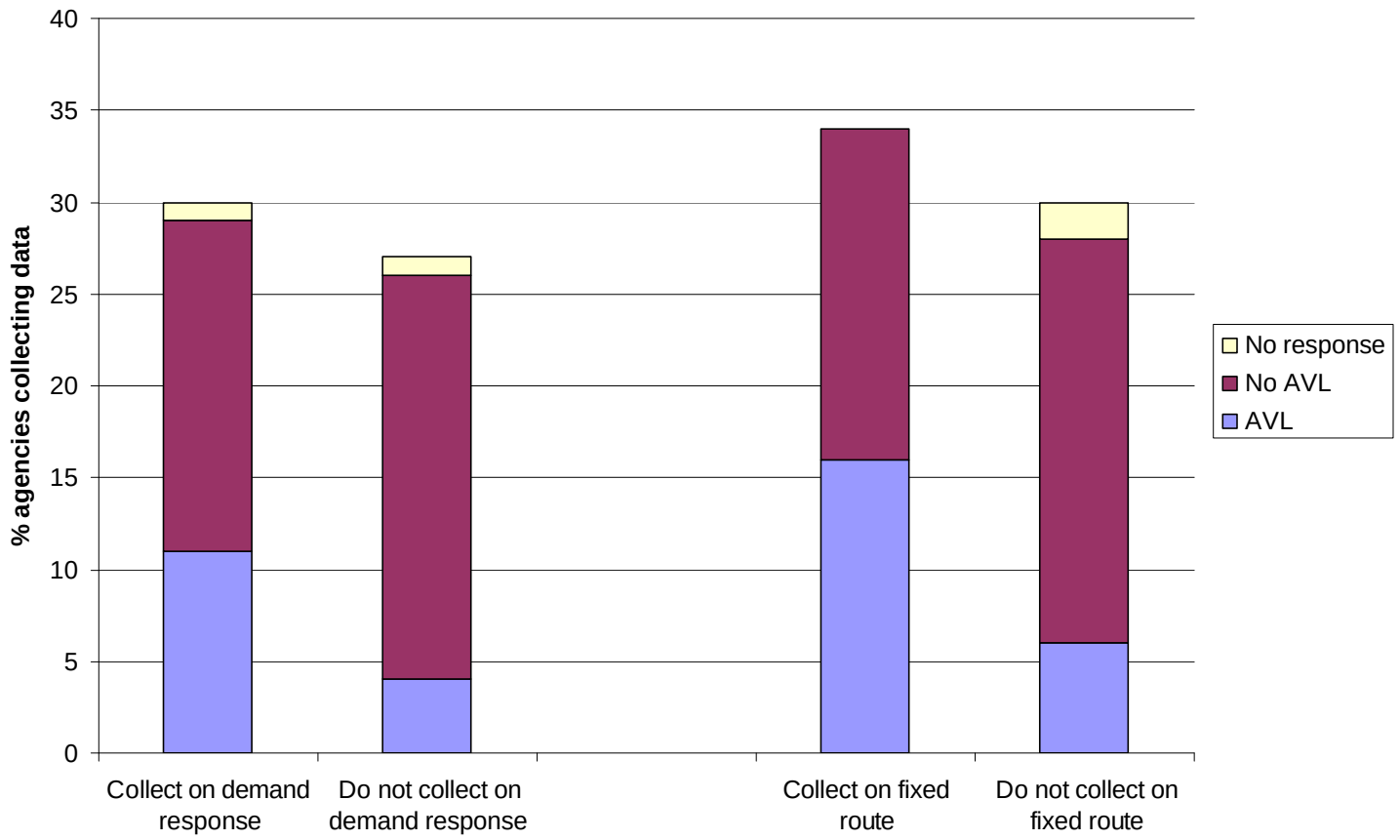
- At least 13 metropolitan areas nationwide currently have enough toll tags to use as probes.
- Another 10 areas have electronic toll collection.
- Some ISPs are exploring the possibility of monitoring cellular traffic to obtain data.

Transit Data Collection

- Vehicle location is only transit information of interest to private sector
- Data collection seems to be more oriented toward planning than provision to the public
- Possible mismatch between metro areas where there is a market and metro areas where data are being collected

Real-time Transit Vehicle Location

Figure 3. AVL and collection of vehicle time and location data



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Transit Data Quality

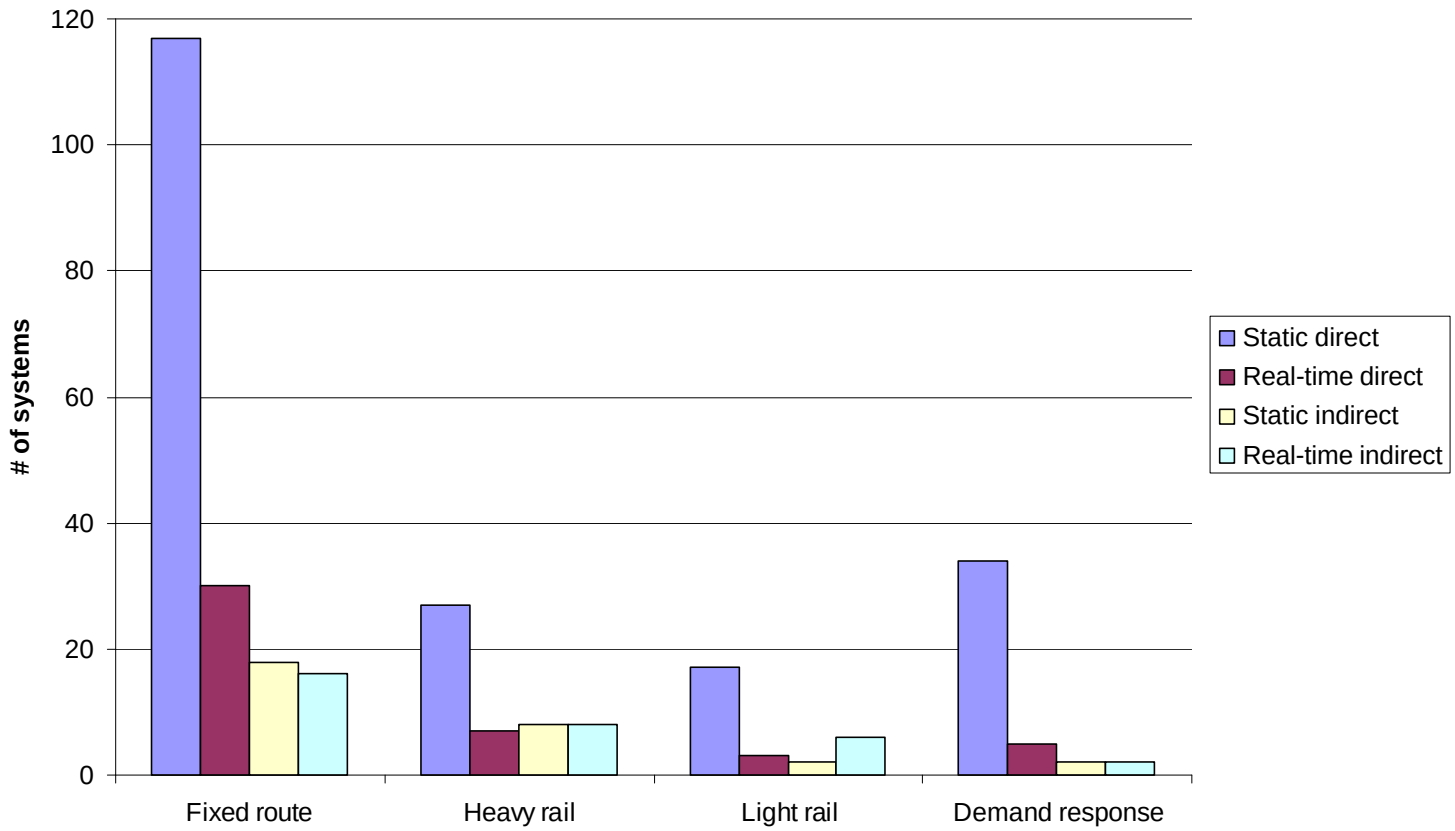
- No ISPs reported data quality problems, just lack of availability
- Geographic coverage could be a problem, analogous to traffic data coverage problem

Transit Data Transfer and Dissemination

- Transit agencies disseminate information to the public rather than providing it to other groups
- 8% of agencies report transferring vehicle time and location data

Transit Information Dissemination

Figure 4. Provision of Transit Information Through Traveler Information Systems



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Transit Data Requestors

- State DOT personnel
- Federal DOT personnel
- MPOs
- Consultants
- Media (TV stations, radio stations)

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Transit Data Future Potential

- More fully use potential of existing AVL systems
- Many new AVL systems in implementation or planning phase

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Conclusions Related to Metro Area Characteristics

- Public agencies in major metropolitan areas collect more traffic data than agencies in smaller areas.
- Geographic coverage of available data is often inadequate, and more likely to be inadequate the larger and more fragmented the metro area.

Conclusions Related to Data Characteristics

- Inaccurate data is the second most common quality problem, after inadequate geographic coverage.
- Agencies in a single metro area provide data inconsistent with other agencies in the area.
- Some ISPs require greater temporal coverage than is available in most places.

Conclusions Related to High Priority Data Items

- **Incident data:**
  - Inaccurate
  - Not timely or updated frequently enough
  - Inadequate geographic coverage
- **Traffic speeds:**
  - Inadequate spatial resolution
  - Inadequate geographic coverage

Conclusions Related to Institutional Issues

- Public agencies are not necessarily willing to transfer data they collect.
- Problems with geographic coverage and consistency result from multiple agencies with responsibilities within a single metro area.

Future Prospects for Technology

- Freeway agencies adding coverage with traditional technologies
- Newer technologies with potential to address coverage problems:
  - Toll tags as probes
  - Monitoring flow of cell phone traffic
  - AVL for transit
- Regional architectures to address consistency problems?

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Potential Institutional Approaches

- Encourage development of appropriate policies for public sector agencies to share info with ISPs
- Improve communication among responding agencies to incidents
- Align public and private sector perspectives on what is valuable to provide to the public

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And on to web pages...

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Description of Review

- Identified traffic & transit web sites through survey responses & links
- Looked at sites to determine which desirable features they possessed
- Results used to examine if agencies disseminate data they collect
- Features of web sites summarized

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Traffic Information Criteria

- The presence of a metro area map
- Real-time traffic information beyond the metro area
- Incident information
- Real-time camera views
- Point-and-click inquiries for traffic conditions
- Prevailing speeds for highway segments
- Real-time travel times between markers
- Links to information about other modes or programs
- Special services
- Frequency of site updates

Transit Information Criteria

- The presence of a system map
- A system map clearly showing transfer points
- A system map supporting point-and-click inquiries for status
- Links/information for other transit agencies in the area
- Real-time information
- Schedule and fare information
- Itinerary planning services
- Links to information about other modes of transportation
- E-mail link/address for customer feedback
- Telephone number for customer feedback

Availability of Features in Metro Areas

- Of 78 metro areas, 42 have at least one traffic site, 38 have at least one transit site
- Majority of areas with traffic sites have incident information and point-and-click for conditions on a road segment
- Prevailing speeds and travel times less common
- Most areas with transit sites have a site with a system map, but only about a third present all modes and transfer points.

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Traffic Site Features Same for Public and Private Sites

- Real-time traffic information beyond the metro area (33%)
- Incident information (85%)
- Prevailing speeds (24%)

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Traffic Site Features More Common on Public Sites

- Real-time camera views (27% vs. 15%)
- Information on other modes or programs (62% vs. 48%)

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Traffic Site Features More Common on Private Sites

- Point-and-click inquiries (68% vs. 40%)
- Real-time travel times (23% vs. 7%)
- Special services (23% vs. 2%)
- Frequency of update 5 minutes or less (80% vs. 42%)
- A map of the metro area (87% vs. 67%)

Transit Site Features More Common on Public Sites

- A system map (88% vs. 57%)
- A system map with transfer points (21% vs. 0)
- A system map with point-and-click (38% vs. 10%)
- Links/information for other transit agencies
- Schedule and fare information (90% vs. 81%)
- Itinerary planning services (8% vs. 0)
- Links to information about other modes (67% vs. 38%)
- Telephone number for customer feedback (65% vs. 48%)

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Transit Site Features Comparable for Public and Private Sites

- Real-time information (3%)
- E-mail link or address for feedback (71%)

Internet Site Summary Observations

- Most metro areas do not have access to valued traffic features
- Private sector traffic sites have more features than public sites
- Public sector transit sites have more features than private sites

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