

511 OVERVIEW

Background

On March 8, 1999, The U.S. Department of Transportation (USDOT) petitioned the Federal Communications Commission (FCC) to designate a nationwide three-digit telephone number for traveler information. This petition was formally supported by 17 State DOTs, 32 transit operators, and 23 Metropolitan Planning Organizations and local agencies. On July 21, 2000 the FCC designated 511 as the national traveler information number.

Key Points

- We asked for 511
- We got 511 with few strings attached
- State and local agencies responsible for implementation
- FCC encourages national use and consistency of service
- FCC will review our progress in 5 years

The FCC ruling leaves nearly all implementation issues and schedules to state and local agencies and telecommunications carriers. There are no Federal requirements and no mandated way to pay for 511; however, USDOT and FCC expect to see some type of nationwide deployment. In 2005, the FCC will review progress in implementing 511.

While the flexibility provided in the FCC ruling is highly desirable, it also presents a challenge. There is a great deal of interest in using 511 throughout the U.S. It is expected that there will be multiple requests for 511, at least in some parts of the U.S., from DOTs, transit agencies, regional and local transportation agencies, as well as private service providers who will offer to implement 511 services for some sort of compensation. If not thoughtfully planned, 511 services could devolve into an inconsistent set of services widely varying in type, quality and cost.

511 Deployment Coordination Program

Mindful of both the opportunity and challenge 511 presents, the American Association of State Highway and Transportation Officials (AASHTO), in conjunction with many other organizations including the American Public Transit Association (APTA) and the Intelligent Transportation Society of America (ITS America), with support from the U.S. Department of Transportation, has established a 511 Deployment Coordination Program.

Key Points

- AASHTO led effort
- Many organizations involved, including APTA, ITS America and U.S. DOT
- Major issues of 511 service content, consistency and cost
- Policy Committee Retreat key for issue resolution and direction setting

The goal of the 511 Deployment Coordination Program is **“the timely establishment of a national 511 traveler information service that is sustainable and provides value to users.”** The intent is to implement 511 nationally using a bottom up approach facilitated by information sharing and a cooperative dialogue through the national associations

represented on the Policy Committee, the governing body of the program. The mission of the Policy Committee is to provide guidance on how to achieve this goal.

A Working Group of practitioners has been formed to support the Policy Committee. In advance of Policy Committee deliberations, the Working Group has identified three major issues that need to be addressed:

- **Content** -- Should there be some minimal level of content and quality of that content?
- **Consistency** -- To what extent should there be some level of consistency among 511 services throughout the U.S.?
- **Cost** -- Should 511 be free to the end user? If so, how should 511 be financed?

These issues will be the cornerstones of the March 29-30 Policy Committee Retreat. The Working Group is currently completing short papers on each of these issues to provide some background and analysis, and make some recommendations to provoke discussion within the Policy Committee. It is hoped that the Policy Committee can reach consensus on some implementation guidelines that you would champion within your respective agency, company or organization, and your association(s). Further, you will be asked to consider organizational roles, responsibilities and functions moving forward to support collective, coordinated action to achieve the directions established during the Retreat.

To support Policy Committee deliberations, the Working Group is also developing short background papers on certain subjects that relate to the issues to be resolved. Some of these papers will be provided at the March 1 briefing, others will be provided in advance of the March 29-30 retreat.

511 Issues Overview

Content

This paper provides information to assist the Policy Committee in examining content issues relating to 511. The paper contains five sections:

1. What is the issue?
2. Why is the issue important?
3. What is the breadth of experience on the issue?
4. What are alternatives?
5. Policy Recommendation(s)?

Similar papers related to consistency and cost issues are also provided. While overlap between content, consistency and cost issues is inevitable, every attempt has been made to separate these issues to promote fruitful discussion of the individual issues.

This paper does not assume either public or private sector delivery of services. The discussion of content is independent of the organizations that collect the data and provide the services. Rather, the discussion is focused on the needs of the callers.

1. What is the issue?

The overarching issue is:

“Should any National Guidelines be established to influence the type of information content to be provided by 511 services?”

If guidelines should be developed, what are the dimensions of those guidelines and how should they be established and used?

Dimensions:

- Should the guidelines recommend content categories?
- Should the guidelines discourage particular content categories?
- Should the guidelines suggest a minimum quality for each content category?

Establishment and Use:

- Who will develop the guidelines?
- What form will the guidelines take?
- Who will adopt the guidelines?

2. Why is the issue important?

The FCC has allocated 511 for “access to traveler information services.” The term “traveler information” can cover an array of subjects. In December 2000, ITS America’s Coordinating Council identified a number of types, or categories, of information that

could be provided via 511 (see Figure 1). It is likely that additional categories could be identified, particularly when contemplating broader transportation modes such as airline flights and inter-city trains.

- Traffic Congestion (Incidents, Closures, Restrictions)
- Public Transportation (Trip Planning, Intermodal Information)
- Special Events
- Travel-Related Weather
- Travel Times
- Link to 911 / Emergency Services (Including Roadside Assistance)
- Multimodal Routing (Trip Planning)
- Routing (Driving Directions, Travel Times)
- Local Information / Points of Interest (Taxi, Food, Parking)
- Location (Where am I?)
- Interregional Information
- Tourist Information
- Incident Reporting (input)

Figure 1 – Candidate 511 Content Categories

Further, while the FCC has given the transportation community almost total flexibility in implementing 511 services, the FCC “encourage[s] federal, state, and local government transportation agencies to work cooperatively to ensure that the transportation information provided using 511 is appropriate to the national scope of our designation and the scarcity of the N11 public resource.” The ruling has created the familiar policy situation of the need to ensure that the appropriate balance of regional autonomy is maintained while still achieving “nationwide scope.”

Direction on content is also important because it lays the groundwork for the policy debate over consistency of 511 service across states and regions. If it is determined that some sort of content guidelines are not desired, the issue of consistency between services may become largely moot.

From the state/local agency perspective the issue of content is important for many reasons, including:

Content drives usage, usage drives impact – Every segment of information content that could be provided via 511 will have a community of users. While the number of users and their usage characteristics will vary, the more types of content provided, the more users and usage that can be expected. Increased usage for a particular type of content will increase the chance of having a positive effect on the transportation system (e.g., a user learns that a rural interstate is impassable and takes an alternate, safer route).

Customer Expectations and Value – Prior to 511, telephone-based traveler information has been a largely state or regional phenomenon. With each service having a unique phone number, is it unlikely that a large number of users have ever used more than a

single system. With 511, users will become aware of their ability to dial 511 wherever they are and may expect the same types and quality of information content region-to-region. Further, knowing what to expect in terms of content could raise the overall value of the collective systems – and the nation’s 511 services as a whole.

Ease of implementation – establishing basic content parameters could facilitate more efficient system development, as designers and implementers will have a roadmap and could more easily leverage the experience of systems from other regions.

Impact on cost and complexity – the more types of information accessible through 511, the greater the overall cost of the system. With each additional type of content, the cost and complexity of gathering and maintaining information will increase. Also, with increased options available, it could take longer for a user to find the desired information, increasing communications costs for the system and complexity for the user.

Agency image – The type of content provided could be positive or negative with respect to the public image of the transportation agency or agencies providing, sponsoring or sanctioning the service. An agency could be commended for providing high-quality useful information even if it focuses on only a narrow range of content. Or, an agency could be commended for making a full range of information available through 511. Of course, an agency could also be criticized for providing only limited information or of trying to provide so much information, that it can not provide quality information in any of the areas. With 511, it is also much more likely regions will be compared against one another, both by the media and users.

3. What is the breadth of experience on the issue?

With phone-based traveler information services being offered in many parts of the country, we have many years of experience to work from. U.S. DOT identified roughly 300 agency operated or sanctioned phone systems in operation that may be candidates for 511 usage. Early research indicates that three principal types of phone services are being provided today that are 511 conversion candidates: statewide road report conditions, regional multi-modal information, and transit service information. While a broad stereotype, the following provides more detail into the types of services and general reception to those services. In each case, an “aggressive” existing deployment is described to illustrate what is possible for deployment. Clearly, consideration must be given to how “typical” these examples are for other areas of the country.

Statewide road report conditions offer weather, construction and major incident information on major highways. These systems vary from a single short, human recorded message covering conditions in the entire state to sophisticated route-specific detailed information updated continuously. Experience shows demand increases substantially for this type of information when conditions are abnormal, such as a winter storm. In these cases, systems designed to handle average daily call volumes become significantly overloaded. These systems have been generally free to the user, often toll-free, with

State DOT’s funding the service as part of their operations or maintenance activities. Figure 2 describes the content provided by Arizona’s system.

- Events: Incidents, Road Closures, Restrictions (21 categories of road-related “events”)
- Event elements: Description (from over 1900 pre-programmed descriptions), location, duration, notes
- Information updated as soon as known
- Telephone system data updated every five minutes

Figure 2 – Arizona’s Content

Metropolitan traffic multi-modal services provide real-time route specific traffic information such as incidents, congestion limits, travel time, and diversion routes. Some systems also provide multi-modal information such as bus, paratransit, ferry, rail, airplane, and bicycle information. Other provided information includes parking, ridesharing, and telecommuting. These types of phone systems have been the subject of most all of the formal evaluation of traveler information phone services. In general, callers seem to be satisfied with the services, with ease of access and the quality, accuracy and timeliness of information being the most important determinants in satisfaction. We also know that a strong correlation exists between quality of content and access and the overall cost of system implementation and operation. Figure 3 describes the content to be provided by TravInfo, San Francisco Bay Area’s telephone system, in an upgrade expected to be in operation by Summer 2002.

Data Types	Data Coverage	Data Accuracy	Data Timeliness
Incident and Slowdown Information	CHP patrolled segments of the Metropolitan Transportation System	Roadway name: 98% Interchange/cross-street: 95% Direction of travel: 98%	Post Incidents within 1 minute of verification Verification completed within 5 minutes 90% of the time Updates within 3 minutes of change of status Post Slowdowns within 3 minutes of verification
Speed and Congestion Status (1 MPH increments)	9 bridges, 42.6 miles Roughly 550 miles of freeways 600 miles of additional roadways (desired)	Error < 15%	Update every 90 seconds or less Latency of 90 seconds when first posted
Transportation Conditions (construction, events, etc.)	Entire Bay Area	95% of available data inputs	As changed, daily basis minimum
Transit Information (Static and Real-time)	Static information from all agencies Real-time information from BART at minimum (depending on study results)	As accurate as the source Transit vehicle arrival times within 5 minutes of actual	Weekly, when appropriate Real-time data at least every 5 minutes
Carpool, Vanpool, Bicycle, Airport Ground Transportation and Commuter Check Information (electronic format)	RIDES	As accurate as the source	As often as data is updated
Paratransit Information	All Agencies	As accurate as the source	
Weather Information	Entire Bay Area	As accurate as the source	Daily; every 4 hours in severe weather
Transportation Assets	Entire Bay Area	As accurate as the source	Quarterly
Disaster Related Information	Entire Bay Area	As accurate as the source	When appropriate, as it is received
Supplemental Information		As accurate as the source	

Note: The requirement is for automated data to be updated in the telephone system every minute; manually entered information within 5 minutes of changed circumstances

Figure 3 – TravInfo Content Requirements

In a recent analysis of the Metropolitan ITS Deployment Tracking Database, a repository of deployment data for the 78 largest metropolitan areas in the United States, indicates that 70 of the 78 areas are gathering at least some type of information that could support 511 services (see Appendix A). By 2005, the number increase to 75, with many of the regions planning to expand and improve their existing data collection systems. The analysis also indicates in most regions, only a handful collect data on a large portion of their region. For example, in 2000, 39 metropolitan areas indicate some sort of limited access surveillance, but only 9 areas report greater than 50% of their total mileage covered. Figure 4 summarizes several key categories of data collection by their total aggregated deployment in the 78 metropolitan areas reported in 1997 and 1999 and projected in 2005.

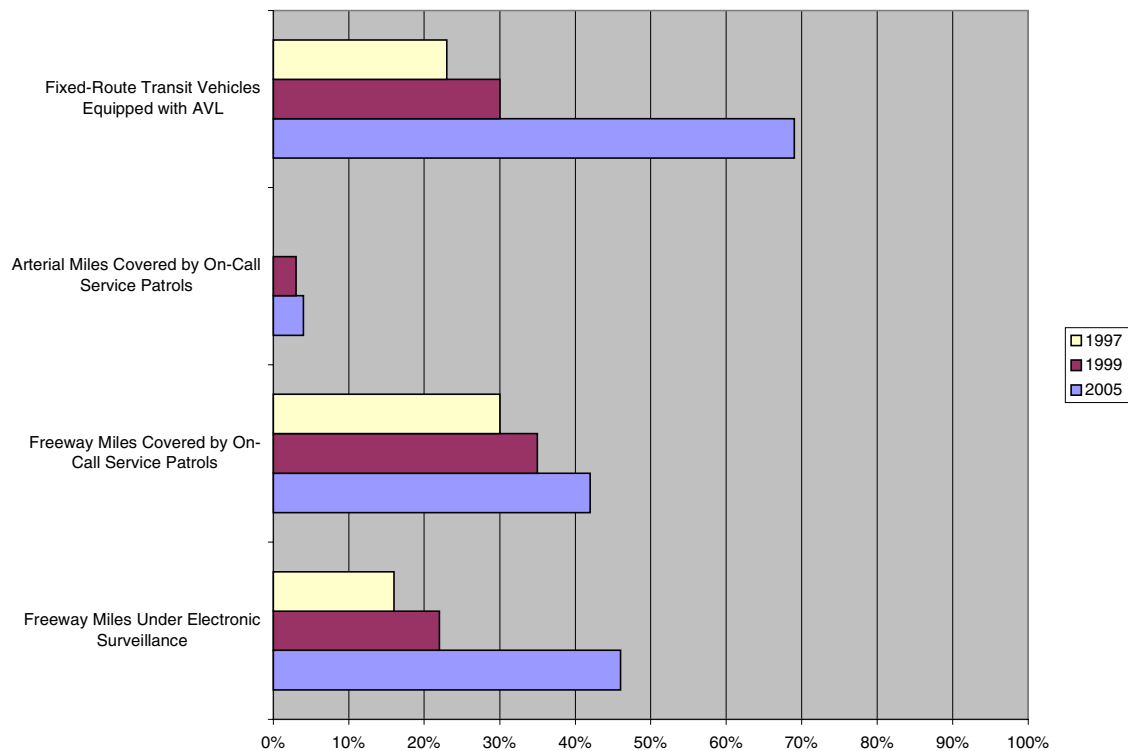


Figure 4 – National Summary of Deployment (by % of deployment opportunity)

Transit service information is generally offered by every transit agency. It is common for transit information centers to assist callers in determining route and schedule options, fares, stop and transfer locations, and many other special requests. Agencies also provide assistance, and in many cases reservations, for paratransit services. These services are all backed by customer service operators. Some of the systems use interactive voice response to support simple inquiries. Also, operators in some agencies are supported by automated trip itinerary planning systems. Overall, these services are difficult and costly to provide, and many customers hang-up before being served. These services are free to the user (though toll and long distance charges may apply) and are usually considered part of a transit agencies operational responsibilities. Figure 5 describes content provided by NJ Transit to approximately 4.2 million callers per year.

- Schedule Route and Fare Information
- Itinerary Planning Services
- Other general transit information
- Information provided via two Transit Information Centers (TIC): North Jersey TIC and South Jersey TIC
- North Jersey TIC:
 - ✓ 48 phone lines
 - ✓ Interactive Voice Response for rail callers (30% of calls)
 - ✓ 88 staff (61 full-time and 19 part-time operators, 8 supervisors)
 - ✓ 18 hours a day, 7 days a week
- South Jersey TIC
 - ✓ 8 phone lines
 - ✓ 11 staff (9 full-time and 1 part-time operators, 1 supervisor)
 - ✓ 16 hours a day, 7 days a week
- Operators access information through windows-based itinerary planning program

Figure 5 – NJ Transit’s Transit Information Center Content

As important as what we have learned to date is what we do not know: the impact of having a uniform access number on the expectations of callers. Presently, with the array of difficult to remember and usually under-advertised phone numbers, it is unlikely that callers of one system have ever tried another system. With the advent of 511, callers could be expected to check the system anywhere they are when the circumstance warrants. Until now, we have had no practical method to test the effect of a universal number on the expectations of callers. Regarding content, this “ubiquity effect” could lead callers to expect the same types of information regardless of location, particularly when in a similar geographic context (e.g., city-to-city).

4. What are Alternatives?

In section 2, the issues are posed as policy questions. In this section, viable alternative policy directions for each question are described. Note that mandated federal direction or regulation options are not included as options. It is the opinion of the Working Group and the relevant staff at U.S. DOT that these options are not viable or desirable and are thus not contemplated.

Issue: *“Should any National Guidelines be established to influence the type of information content to be provided by 511 services?”*

Alternatives:

- Yes. Then all of the following issues apply.
- No. Then the following issues are not applicable.

Issue: *Should the guidelines recommend content categories?*

Alternatives:

- Specify content categories, limit flexibility. System would provide if content is available. Additional content would be discouraged.
- Identify minimum, baseline, content categories. System would provide these categories if available/appropriate in service region. Additional categories would be provided at the implementer's option. Baseline might vary based on geographic considerations (e.g. urban vs. rural).
- Do not specify content categories.

Issue: *Should the guidelines discourage particular content categories?*

Alternatives:

- Do not discourage content categories. Leave implementers the discretion to determine the range of content offered.
- Discourage certain content categories. Certain categories that may be considered either inappropriate for 511 services or not mature at the present time to warrant inclusion. This alternative could be selected for a number of reasons, including (1) wanting to establish a clear focus to 511 services by minimizing the range of content to be provided and (2) setting the tone for government-sanctioned services by separating basic and advanced content offerings.

Issue: *Should the guidelines suggest a minimum quality for each content category?*

Alternatives:

- Silent on quality. Let implementers determine the cost-benefit of content quality in their systems.
- Suggest minimum quality levels for baseline content. These quality levels could be based upon the Traveler Information Data Quality Guidelines published by ITS America in 2000. These guidelines address topics such as content accuracy, timeliness, confidence, availability, and breadth and depth of coverage. Quality of service access (e.g., response time, number of dropped calls, etc.) and methods of measuring quality could also be included.
- Suggest minimum quality levels for all content categories where possible.

Issue: *Who will develop the guidelines?*

Alternatives:

- Individual Organizations. Guidelines can be established by specific organizations for their constituents. For example, AASHTO could establish guidelines for Statewide Road Report services or APTA could do the same for Transit Service Information systems.
- This Coalition. The coalition of stakeholders could collectively create guidelines that integrate the needs and desires of various constituents into a single set of guidelines.
- U.S. DOT. The U.S. DOT can publish guidelines that have been developed either within U.S. DOT or with the assistance of outside stakeholders.

Issue: *What form will the guidelines take?*

Alternatives:

- Information Report. The guidelines will be published as the “collective thoughts of people and organizations interested in the subject.” It will be published as a resource to the community.
- Recommended Practice or Policy. Slightly stronger than an information report, implementers would be actively encouraged to consider the guidelines when developing their systems.
- Standard. Stronger than a recommended practice or policy, a standard, though still voluntary, would be subject to formal consensus building and voting in its establishment.

Issue: *Who will adopt the guidelines?*

Alternatives:

- No formal adoption. Guidelines would be published, but not formally adopted as policy by any specific organization.
- Narrow adoption by sponsoring organizations. The sponsoring organizations, AASHTO, APTA and ITS America would adopt the guidelines as policy.
- Broad adoption by participating organizations. In addition to the sponsoring organizations, participating organizations such as the National Association of Counties and the Association of Metropolitan Planning Organizations would be encouraged to consider adoption of the guidelines.

5. *Policy Recommendations?*

In considering the issue of content guidelines, the Working Group advances the following straw recommendations to the Policy Committee as a means to initiate debate.

- “Should any National Guidelines be established to influence the type of information content to be provided by 511 services?” *Yes.*
- Should the guidelines recommend content categories? *Minimum baseline content categories.*
- Should the guidelines discourage particular content categories? *Do not discourage content categories.*
- Should the guidelines suggest a minimum quality for each content category? *Minimum quality levels for baseline content where possible to establish.*
- Who will develop the guidelines? *This Coalition.*
- What form will the guidelines take? *Recommended Practice or Policy.*
- Who will adopt the guidelines? *Narrow adoption by sponsoring organizations, with possible encouragement of other organizations to adopt as well.*

In terms of next steps, the Working Group recommends that the Policy Committee task the Working Group to explore in depth the known candidate content categories and develop a recommendation on a minimum set to include in guidelines, and where possible, develop quality guidelines and methods of performance measurements as well. In this effort, careful consideration should be given to the impact of differing geography on desired content. Also, consumer studies should be conducted to understand what is desired in terms of content and in particular how “nationalizing the system” will effect the desired content.

APPENDIX A

MEMORANDUM

TO: Joe Peters

FROM: Steve Gordon

DATE: March 14, 2001

SUBJECT: "511" Analysis of Metropolitan Deployment Tracking Data

Background

At least three hundred telephone numbers currently exist for travel information systems in the United States. To overcome the confusion caused by this array of numbers, the United States Department of Transportation (USDOT) petitioned the Federal Communication Commission (FCC) for a national assignment of a single three-digit dialing code, N11. On July 20, 2000 the FCC assigned 511 as a nationwide telephone number for ITS traveler information.

The US DOT Joint Program Office has requested an analysis of the Metropolitan Deployment Tracking database for the purpose of understanding the level of infrastructure currently in place, or projected to be in place by 2005, that would support implementation of a 511 system. It is expected that a 511 system would convey to travelers information describing the level of congestion, incidents, and planned events affecting highway travel as well as route, schedule and fare information for the transit system in a metropolitan area. It is important, therefore, to understand the availability of such information in a metropolitan area in order to gauge its readiness for implementation of 511. In order to develop this understanding, recently collected data contained in the Metropolitan Deployment tracking database was used.¹

Three of the deployment tracking indicators were selected to provide an estimate of the level of data collection and dissemination within each metropolitan area. The first of these was the coverage of freeway surveillance, using sensors and/or probes, to provide real time traffic information. The second was the coverage of incident detection and verification, using close circuit television (CCTV) and service patrols, to provide real time data on incident location, severity, and clearance time. Finally, the availability of transit information was assessed based on the existence of an automatic phone service providing schedules, routes, and fares.

¹ 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>.

Measuring the Level of 511 Readiness

The process for determining the level of 511 readinesses in a metropolitan area makes use of the indicators and threshold values contained in Table 1. Thresholds for Freeway surveillance and Incident Management CCTV/service patrol coverage is set at zero, meaning that a metropolitan area is given credit for any level of deployment. An excursion is provided at the end of this memo that evaluates the sensitivity of the results to variations in these thresholds in the range of 10% to 50% coverage.

Table 1
Component Indicators and Threshold Values Used to Measure 511 Readiness

Traveler Information	Indicators	Threshold Values
Traffic Congestion	% freeway miles under electronic surveillance	Greater than or equal to 0%
Traffic Incidents	% freeway miles with Freeway Service Patrols % freeway miles with CCTV % arterial miles with Arterial Service Patrols % arterial miles with CCTV	Greater than or equal to 0%
Transit Route, Schedule, and Fares	% agencies operating telephone information number	Greater than or equal to 0%

A metropolitan area is assigned a rating of “3” in readiness if it exceeds the threshold value for at least one of the indicators in each of the three traveler information categories. A region is assigned a rating of “2” in readiness if it exceeds the threshold value for two of the traveler information categories. A metropolitan area is assigned a rating of “1” in readiness if it exceeds the threshold value for one of the traveler information categories. A rating of “0” is assigned if an area does not exceed any of the threshold values.

As shown in Figure 1, using the methodology described above, a total of 30 metropolitan areas are rated “3” in readiness, 28 are rated “2” in readiness and 12 are assigned a rating of “1” in readiness in 2000. A total of 8 areas do not cross any of the threshold values and are assigned a rating of “0”. Table 1 lists the 78 metropolitan areas and their respective readiness rating for 2000.

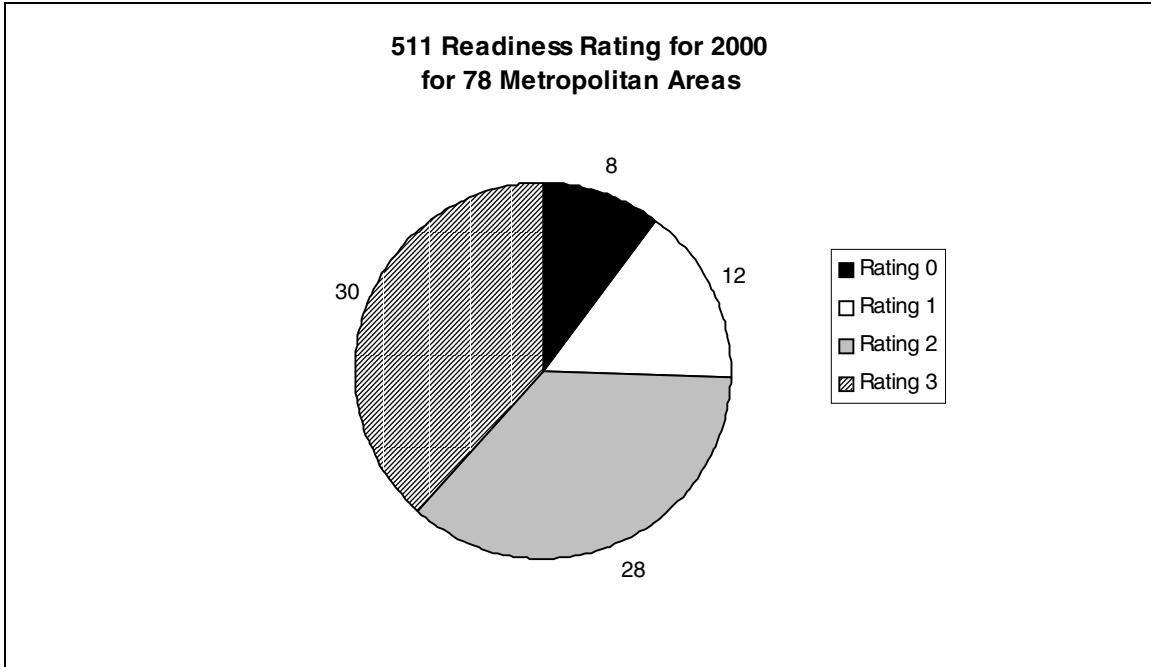


Figure 1

MetroArea	Surveillance	Patrols/CCTV	Automated Transit Information	Rating
Albany, Schenectady, Troy	Yes	yes	yes	3
Atlanta	Yes	yes	yes	3
Baltimore	Yes	yes	yes	3
Boston, Lawrence, Salem	Yes	yes	yes	3
Buffalo, Niagara Falls	Yes	yes	yes	3
Charlotte, Gastonia, Rock Hill	yes	yes	yes	3
Chicago, Gary, Lake County	yes	yes	yes	3
Cincinnati, Hamilton	yes	yes	yes	3
Dallas, Fort Worth	yes	yes	yes	3
Detroit, Ann Arbor	yes	yes	yes	3
Fresno	yes	yes	yes	3
Greenville, Spartanburg	yes	yes	yes	3
Hartford, New Britain, Middletown	yes	yes	yes	3
Houston, Galveston, Brazoria	yes	yes	yes	3
Indianapolis	yes	yes	yes	3
Los Angeles, Anaheim, Riverside	yes	yes	yes	3
Louisville	yes	yes	yes	3
Milwaukee, Racine	yes	yes	yes	3
Minneapolis, St. Paul	yes	yes	yes	3
New Haven, Meriden	yes	yes	yes	3
New York, Northern New Jersey, Southwestern Connecticut	yes	yes	yes	3
Philadelphia, Wilmington, Trenton	yes	yes	yes	3

MetroArea	Surveillance	Patrols/CCTV	Automated Transit Information	Rating
Pittsburgh, Beaver Valley	yes	yes	yes	3
Providence, Pawtucket, Fall River	yes	yes	yes	3
Sacramento	yes	yes	yes	3
Salt Lake City, Ogden	yes	yes	yes	3
San Diego	yes	yes	yes	3
San Francisco, Oakland, San Jose	yes	yes	yes	3
Seattle, Tacoma	yes	yes	yes	3
Washington	yes	yes	yes	3
Total Metropolitan areas with rating of 3 : 30				
Albuquerque	no	yes	yes	2
Austin	yes	yes	no	2
Bakersfield	yes	yes	no	2
Baton Rouge	yes	yes	no	2
Charleston	no	yes	yes	2
Cleveland, Akron, Lorain	no	yes	yes	2
Columbus	no	yes	yes	2
Dayton, Springfield	no	yes	yes	2
Denver, Boulder	no	yes	yes	2
El Paso	yes	yes	no	2
Greensboro, Winston-Salem, High Point	no	yes	yes	2
Hampton Roads	yes	yes	no	2
Harrisburg, Lebanon, Carlisle	no	yes	yes	2
Jacksonville	no	yes	yes	2
Memphis	no	yes	yes	2
Miami, Fort Lauderdale	no	yes	yes	2
New Orleans	no	yes	yes	2
Orlando	yes	yes	no	2
Phoenix	no	yes	yes	2
Portland, Vancouver	yes	yes	no	2
Raleigh-Durham	no	yes	yes	2
Rochester	yes	yes	no	2
San Antonio	no	yes	yes	2
Springfield	no	yes	yes	2
St. Louis	yes	yes	no	2
Tampa, St. Petersburg, Clearwater	no	yes	yes	2
Tucson	no	yes	yes	2
Wichita	no	yes	yes	2
Total Metropolitan areas with rating of 2 : 28				
Allentown, Bethlehem, Easton	no	yes	no	1
Birmingham	no	yes	no	1
Grand Rapids	no	yes	no	1
Kansas City	no	yes	no	1
Knoxville	no	yes	no	1
Las Vegas	no	yes	no	1

MetroArea	Surveillance	Patrols/CCTV	Automated Transit Information	Rating
Little Rock, North Little Rock	no	no	yes	1
Omaha	no	yes	no	1
Sarasota-Bradenton	no	no	yes	1
Scranton, Wilkes-Barre	no	yes	no	1
Syracuse	no	yes	no	1
West Palm Beach, Boca Raton, Delray	no	yes	no	1
Total Metropolitan areas with rating of 1 : 12				
Honolulu	no	no	no	0
Nashville	no	no	no	0
Oklahoma City	no	no	no	0
Richmond, Petersburg	no	no	no	0
San Juan	no	no	no	0
Toledo	no	no	no	0
Tulsa	no	no	no	0
Youngstown, Warren	no	no	no	0
Total Metropolitan areas with rating of 0 : 8				

In the deployment tracking surveys respondents were asked to project the level of deployment for 2005. Using these projections for 2005, it can be calculated that the number of metropolitan areas rated “3” will increase from 30 to 45 by 2005. The number rated “2” will decrease from 28 to 23 and the number rated “1” will decrease from 8 to 7. Finally, the number rated “0”, with no data gathering or dissemination in any of the three categories, will reduce from 8 to 3. Table 2 lists the 78 metropolitan areas and their respective readiness rating for 2005.

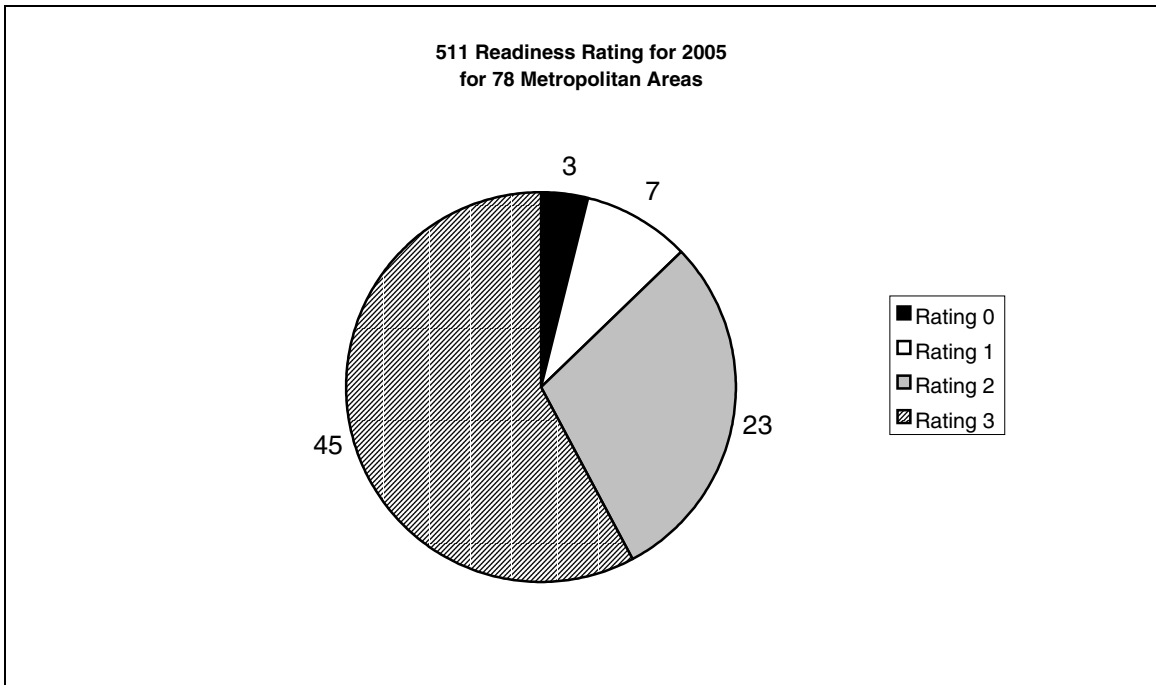


Figure 2

MetroArea	Surveillance	Patrols/CCTV	Automated Transit Information	Rating
Albany, Schenectady, Troy	yes	yes	yes	3
Atlanta	yes	yes	yes	3
Baltimore	yes	yes	yes	3
Baton Rouge	yes	yes	yes	3
Boston, Lawrence, Salem	yes	yes	yes	3
Buffalo, Niagara Falls	yes	yes	yes	3
Charleston	yes	yes	yes	3
Charlotte, Gastonia, Rock Hill	yes	yes	yes	3
Chicago, Gary, Lake County	yes	yes	yes	3
Cincinnati, Hamilton	yes	yes	yes	3
Cleveland, Akron, Lorain	yes	yes	yes	3
Columbus	yes	yes	yes	3
Dallas, Fort Worth	yes	yes	yes	3
Detroit, Ann Arbor	yes	yes	yes	3
El Paso	yes	yes	yes	3
Fresno	yes	yes	yes	3
Greensboro, Winston-Salem, High Point	yes	yes	yes	3
Greenville, Spartanburg	yes	yes	yes	3
Harrisburg, Lebanon, Carlisle	yes	yes	yes	3
Hartford, New Britain, Middletown	yes	yes	yes	3
Houston, Galveston, Brazoria	yes	yes	yes	3
Indianapolis	yes	yes	yes	3

MetroArea	Surveillance	Patrols/CCTV	Automated Transit Information	Rating
Jacksonville	yes	yes	yes	3
Knoxville	yes	yes	yes	3
Los Angeles, Anaheim, Riverside	yes	yes	yes	3
Louisville	yes	yes	yes	3
Miami, Fort Lauderdale	yes	yes	yes	3
Milwaukee, Racine	yes	yes	yes	3
Minneapolis, St. Paul	yes	yes	yes	3
New Haven, Meriden	yes	yes	yes	3
New York, Northern New Jersey, Southwestern Connecticut	yes	yes	yes	3
Orlando	yes	yes	yes	3
Philadelphia, Wilmington, Trenton	yes	yes	yes	3
Pittsburgh, Beaver Valley	yes	yes	yes	3
Providence, Pawtucket, Fall River	yes	yes	yes	3
Raleigh-Durham	yes	yes	yes	3
Rochester	yes	yes	yes	3
Sacramento	yes	yes	yes	3
Salt Lake City, Ogden	yes	yes	yes	3
San Diego	yes	yes	yes	3
San Francisco, Oakland, San Jose	yes	yes	yes	3
Seattle, Tacoma	yes	yes	yes	3
Tampa, St. Petersburg, Clearwater	yes	yes	yes	3
Tucson	yes	yes	yes	3
Washington	yes	yes	yes	3
Total Metropolitan areas with rating of 3: 45				
Albuquerque	no	yes	yes	2
Allentown, Bethlehem, Easton	yes	yes	no	2
Austin	yes	yes	no	2
Bakersfield	yes	yes	no	2
Birmingham	yes	yes	no	2
Dayton, Springfield	no	yes	yes	2
Denver, Boulder	no	yes	yes	2
Hampton Roads	yes	yes	no	2
Kansas City	yes	yes	no	2
Las Vegas	yes	yes	no	2
Memphis	no	yes	yes	2
Nashville	yes	yes	no	2
New Orleans	no	yes	yes	2
Phoenix	no	yes	yes	2
Portland, Vancouver	yes	yes	no	2
Richmond, Petersburg	yes	no	yes	2
San Antonio	no	yes	yes	2
Scranton, Wilkes-Barre	yes	yes	no	2
Springfield	no	yes	yes	2
St. Louis	yes	yes	no	2
Syracuse	yes	yes	no	2

MetroArea	Surveillance	Patrols/CCTV	Automated Transit Information	Rating
West Palm Beach, Boca Raton, Delray	yes	yes	no	2
Wichita	no	yes	yes	2
Total Metropolitan areas with rating of 2: 23				
Little Rock, North Little Rock	no	no	yes	1
Oklahoma City	no	yes	no	1
Omaha	no	yes	no	1
San Juan	no	no	yes	1
Sarasota-Bradenton	no	no	yes	1
Toledo	no	no	yes	1
Tulsa	no	yes	no	1
Total Metropolitan areas with rating of 1: 7				
Grand Rapids	no	no	no	0
Honolulu	no	no	no	0
Youngstown, Warren	no	no	no	0
Total Metropolitan areas with rating of 0: 3				

Sensitivity Analysis

Threshold values for several indicators were varied to examine the resulting distribution of metropolitan area readiness. Values ranging between 0% and 50% were tested for indicators measuring freeway surveillance (Table 3) and traffic incident detection (Table 4.) Table 5 contains the results of considering both types of surveillance at the same time (e.g. metro areas with both freeway and incident management surveillance at 10%, 20% and so on.)

Table 2
Sensitivity Values Tested

Traveler Information	Indicators	Test Values
Traffic Congestion	% freeway miles under electronic surveillance	Greater than 0% Greater than 10% Greater than 20% Greater than 30% Greater than 40% Greater than 50%
Traffic Incidents	% freeway miles with Freeway Service Patrols % freeway miles with CCTV % arterial miles with Arterial Service Patrols % arterial miles with CCTV	Greater than 0% Greater than 10% Greater than 20% Greater than 30% Greater than 40% Greater than 50%
Transit Route, Schedule, and Fares	% agencies operating telephone information number	Greater than 0%

Table 3
Number of Metropolitan Areas with Coverage Greater than Variable Thresholds
Freeway Surveillance Indicator, 2000 and 2005

	% Freeway Surveillance 2000					
	0%	10%	20%	30%	40%	50%
Level 3	30	26	21	15	10	8
Level 2	28	30	32	37	40	42
Level 1	12	14	17	18	20	20
Level 0	8	8	8	8	8	8
Total:	78	78	78	78	78	78

	% Freeway Surveillance 2005					
	0%	10%	20%	30%	40%	50%
Level 3	45	43	40	35	29	23
Level 2	23	25	25	27	32	35
Level 1	7	7	10	13	14	17
Level 0	3	3	3	3	3	3
Total:	78	78	78	78	78	78

Table 4
Number of Metropolitan Areas with Coverage Greater than Variable Thresholds
Incident Management Indicator, 2000 and 2005

	%CCTV/Service Patrol 2000					
	0%	10%	20%	30%	40%	50%
Level 3	30	28	28	21	16	12
Level 2	28	25	20	25	24	28
Level 1	12	15	19	20	26	23
Level 0	8	10	11	12	12	15
Total:	78	78	78	78	78	78

	%CCTV/Service Patrol 2005					
	0%	10%	20%	30%	40%	50%
Level 3	45	45	43	40	34	31
Level 2	23	21	19	18	22	24
Level 1	7	8	12	16	18	18
Level 0	3	4	4	4	4	5
Total:	78	78	78	78	78	78

Table 5
Number of Metropolitan Areas with Coverage Greater than Variable Thresholds
Freeway Surveillance and Incident Management Indicators, 2000 and 2005

	% Freeway Surveillance and CCTV/Service Patrols 2000					
	0%	10%	20%	30%	40%	50%
Level 3	30	25	21	13	6	3
Level 2	28	26	22	22	22	22
Level 1	12	16	22	29	32	32
Level 0	8	11	13	14	18	21
Total:	78	78	78	78	78	78

	% Freeway Surveillance and CCTV/Service Patrols 2005					
	0%	10%	20%	30%	40%	50%
Level 3	45	43	38	34	27	21
Level 2	23	23	22	18	17	17
Level 1	7	8	13	18	26	30
Level 0	3	4	5	8	8	10
Total:	78	78	78	78	78	78

Summary and Conclusions

Tables 3, 4, and 5 show that the ratings assigned to metropolitan areas are quite sensitive to changes in the threshold values for freeway surveillance and incident verification. As thresholds increase, the number of metropolitan areas meeting the higher level ratings decrease, with a corresponding movement to the lower levels. This trend is magnified as shown in Table 5, where thresholds are varied for both types of surveillance simultaneously. In this case, if the level of surveillance of both is set at fifty percent, only three metropolitan areas are included in level 3.

Even more potentially significant is the relatively low number of metropolitan areas that pass even the first threshold, surveillance greater than zero. This indicates that in the year 2000 less than half of the metropolitan areas have even a small level deployment in all three areas. While 2005 projections show improvement, it appears that by that time a substantial number of areas will still be without real time data in all three areas.

While transit data dissemination is widespread, deployment of freeway surveillance and incident detection is limited, particularly at higher coverage levels. These latter two factors were studied separately and the results are shown in the following figures. The charts shows the number of metropolitan areas (on the left axis) having a deployment level greater than or equal to the coverage selected from the bottom axis (0% equates to more than 0.) Data for 2000 and 2005 (projections) are shown.

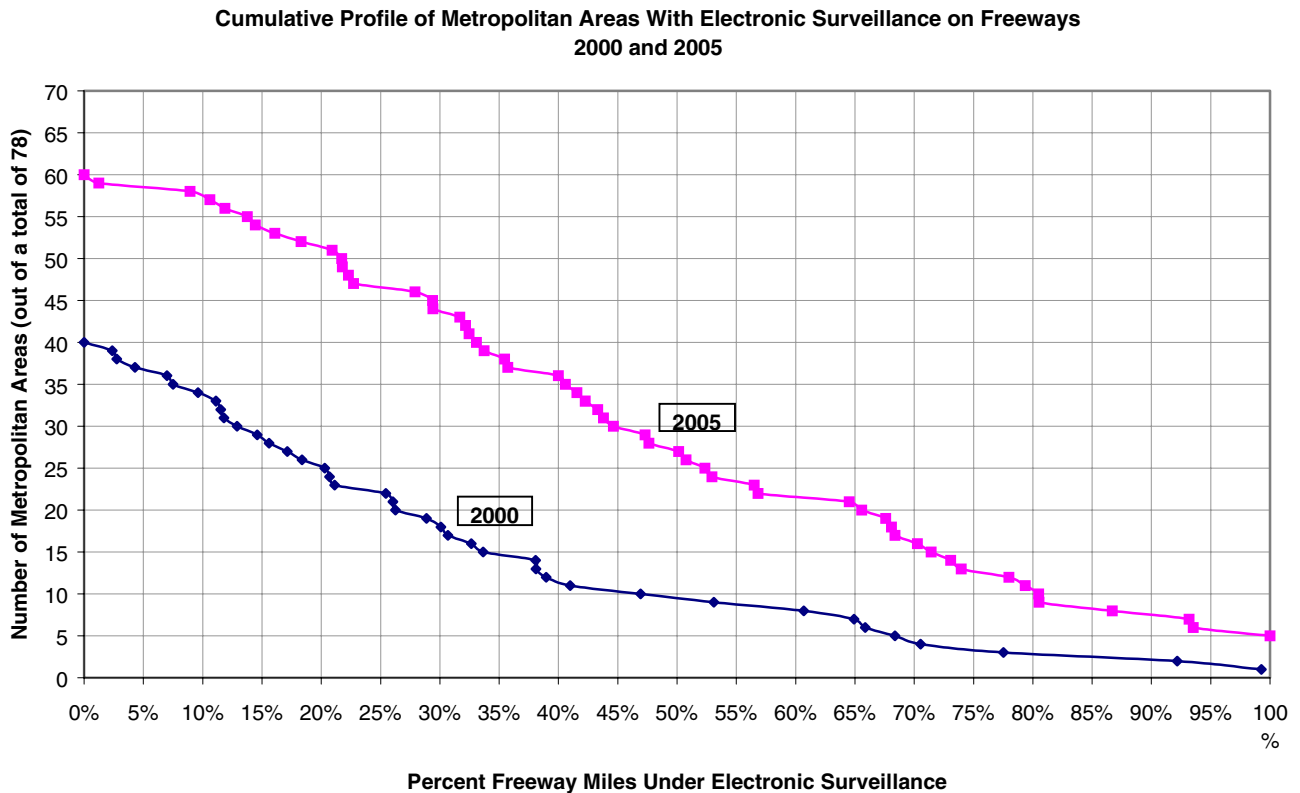


Figure 3

**Cumulative Profile of Metropolitan Areas With Service Patrols/CCTV Coverage
2000 and 2005**

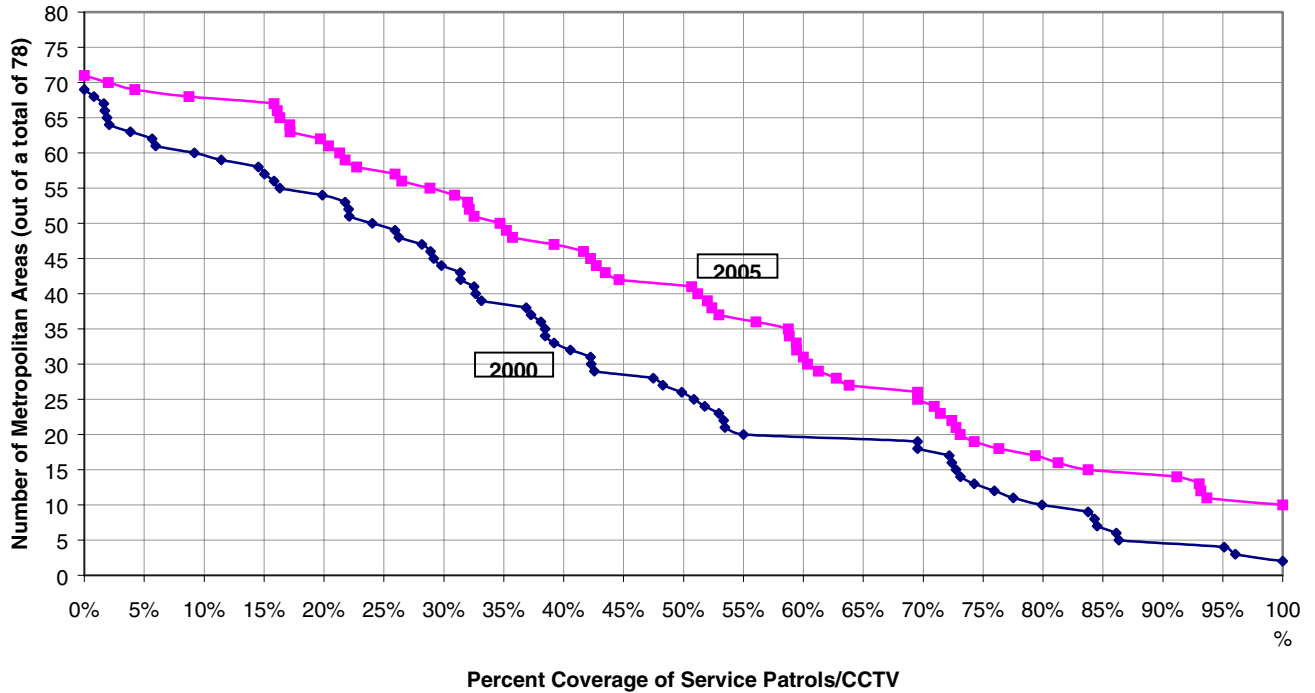


Figure 4

Figure 3 shows the breakout for levels of freeway surveillance in 2000 and 2005. The chart shows that in 2000, fully half of the metropolitan areas surveyed reported no traffic sensors or probe vehicles. Of those reporting they did have freeway surveillance, the coverage in most cases was 30% or less. In 2005, the number of areas without surveillance is reduced to 19, and the coverage levels increase, but still with most reporting 50% or less coverage. Figure 4 shows the same information for incident management coverage. In this case, only 10 metropolitan areas report no coverage in 2000, with about half of those reporting some deployment at the 40% or less level. Looking ahead to 2005 does not change the picture substantially, showing that only modest growth in deployment is planned. These charts indicate that even by 2005, a substantial number of metropolitan areas will have no deployed capability for real-time data gathering concerning traffic and incidents, while those that do will typically cover half or less of the roadway.

511 Issues Overview

Consistency

This paper provides information to assist the Policy Committee in examining consistency issues relating to 511. The paper contains five sections:

1. What is the issue?
2. Why is the issue important?
3. What is the breadth of experience on the issue?
4. What are alternatives?
5. Policy Recommendation(s)?

Similar papers related to content and cost issues are also provided. While overlap between content, consistency and cost issues is inevitable, every attempt has been made to separate these issues to promote fruitful discussion of the individual issues. The content and cost papers address many issues of consistency, but they are significant enough to warrant separate discussions.

This paper does not assume either public or private sector delivery of services. The discussion of consistency is independent of the organizations that collect the data and provide the services. Rather, the discussion is focused on the needs of the callers.

1. What is the issue?

The overarching issue is: ***“Should there be national consistency on the 511 service?”***

What does consistency mean in the context of 511 services? In our context, consistency means the similarity of caller experience across multiple systems offering 511 services across the country. The Working Group has not considered consistency to mean exactly identical.

If consistency is desired, in what forms should consistency take? How should such consistency be established?

Some of the areas that are candidates for consistency include:

- System Navigation
- System Access Quality
- Initial Greeting
- Advertising/Sponsorship rules
- ADA Compliance
- Hours of System Operation
- Multi-lingual capabilities
- Timestamp information
- Roadside signing

2. Why is the issue important?

This issue is important for at least two reasons:

1. The FCC “encourage[s] federal, state, and local government transportation agencies to work cooperatively to ensure that the transportation information provided using 511 is appropriate to the national scope of our designation and the scarcity of the N11 public resource.” In other words, ***the FCC expects the transportation industry to deliver at least some level of consistent service via 511.***
2. With the possibility of dialing the same number for information in multiple regions, consumers could expect similar service in regions served by different systems. In fact, callers could be completely unaware that 511 services are separate systems. In other words, ***callers could expect and even demand consistency of 511 services.***

Well crafted policies on consistency could accelerate the introduction and expand the usage and impact of 511 services. Poorly crafted policies could slow or stifle introduction and usage. How the transportation industry chooses to go about attempting to achieve consistency and in what areas are efforts focused is the subject of this discussion.

3. What is the breadth of experience on the issue?

911 is the only comparable phone-based service that uses a uniform abbreviated number on an essentially nation-wide basis to access services provided by a patchwork of call centers operated by all forms of public agencies. In terms of consistency, the only notable item is that operators are discouraged from taking time to let the caller know what agency the call has gone to (“xxx county 911 center...”). Instead, they are encouraged to say just “911”. Other than that, there is little done at the national level that can be looked upon as consistency. Though not the norm, some states are adopting performance standards for the 911 system, which could be considered state level efforts to establish consistency of service.

In most other cases of national phone-based services, callers dial the same 10-digit number and access the same system, thus essentially guaranteeing consistency of service.

Other than helping identify areas for consideration, present telephone-based traveler information systems offer little assistance in the issue of consistency. Perhaps the only consistent thread across these systems is that they all have some sort of initial greeting that includes the project name and/or the sponsoring agency(ies).

Perhaps the most successful example of consistency in the transportation business is the interstate highway system. Users of the interstate system have expectations such as controlled access interchanges, high-speed geometric design and consistent signage. Such consistency is based upon consensus design standards that must be followed, standards that were carefully crafted and are periodically evaluated and modified. It is also noteworthy that the consensus that led to the establishment of the 1956 legislation enabling the interstate system took decades to form.

It is difficult to identify other industries in which information is provided nation-wide by a patchwork of organizations. Perhaps television and radio stations offer the closest analogy. There are many regulations governing broadcasters, all of whom operate under an FCC license. Only a few of the areas covered in regulations could be construed as consistency measures, most having to do with things broadcasters cannot do, including airing of obscene or indecent language, some types of lottery information, obtain money under false pretenses, equal access for election candidates, advertising limits on children's TV programming, omit acknowledgement of program sponsorship or underwriting, and advertising of tobacco. Further, as stated by the FCC in a paper titled *The FCC and Broadcasting*, "Under the public interest standard in the Communications Act, the FCC expects its broadcast licensees to be aware of the important problems or issues in the communities their stations serve and to foster public understanding by presenting some programs and/or announcements about local issues, but broadcasters--not the FCC or other governmental agencies--are responsible for selecting all the material aired by their stations."

Thus, what information is provided and how it is packaged is left up to broadcasters. Yet, a remarkable degree of consistency in service now exists. For example, television programs begin on the hour or half hour in most cases, with commercials spread throughout. Admittedly, broadcasting is decades old and quite mature when compared to 511, but it does provide an example where consistency issues were largely left up to the service providers and the feedback of their audience.

(It is important to recognize that the FCC has no plans to license 511 operations. This information provided is purely illustrative, and is not intended to infer FCC rule-making as a method of establishing consistency criteria.)

4. What are alternatives?

For each of the areas listed below, the options available are similar:

- **How detailed?** Recommendation can range from being silent and providing flexibility to implementers to minimum "guidelines" to specific recommendations.
- **How couched?** Can range from "recommended practice" to a standard.

Topic Area: *System Navigation*

This area addresses what is the user interface for phone systems. There are several elements to this topic area, including

- Menu trees: This is the term commonly used to refer to systems that scroll through menu options (“press 1 for transit, 2 for traffic”, etc.). Note that not all systems today have a menu tree, rather a user must listen for their information as part of a single long message. *Should every system have a menu tree? Should there be a standard top-level menu tree? Should the menu tree structure beyond a top-level be consistent (e.g., should systems have a common navigation menu for transit-related information)?*
- Voice Commands: Increasingly, systems are offering callers the option to say “transit” instead of hitting the keypad. In some cases the option is either to press or say the number (“press or say 1 for transit”), in others, the option is to say the category of information desired (“say traffic”). *Should consistent terms for content categories be established? Should those terms be used as voice enabled commands? Should all systems offer voice enabled commands?*
- Shortcuts: Some systems offer the ability to directly access a route, or an agency by using a shortcut command, such as 17# for I-17 in Arizona, or 91* for METRO bus information in Cincinnati. *Should a consistent format for shortcuts be established? Should shortcuts be part of all systems? Should shortcuts be available in voice commands in addition to numerical entry?*

Topic Area: *System Access Quality*

This area relates to the performance of the telephone system. Existing systems vary widely in their access quality. Some systems are designed for peak period usage, reducing or eliminating busy signals. Other systems are designed for average usage and become overloaded in high demand periods. Some systems enable users to quickly obtain information, others take much longer. *Should there be consistent targets for access quality?*

Topic Area: *Initial Greeting*

The initial greeting of each system could vary widely. Greetings could vary in length. Some could indicate their sponsoring organization; others could use the name of the program or the brand of the service. *Should there be a reference to a national service in the greeting? Should there be a statement forwarding people to 911? Should there be limits on the greeting, such as time and content?*

Topic Area: *Advertising/Sponsorship rules*

Advertisements, sponsorships or connections to value-added services (e.g., options could be available to make a taxi reservation, with the taxi firm providing a fee to the phone system operator for the connection) are possible approaches to generate revenue to support the system. However, a scenario could occur in which there is wide variance in the approaches to generating these revenues. Thus, the result could be greetings of widely varying lengths, and an uneven approach to connections to extra services. *Should there be any limitations or guidelines associated with advertising or sponsorship? Should connections to value-added or premium services be encouraged or discouraged?*

Topic Area: *ADA Compliance*

The American with Disabilities Act (ADA) became effective in the early 1990s to provide equal rights and opportunities to disabled citizens in many areas, including employment, access to state and local government services, public transportation services, and telecommunications. While there are specific provisions in the ADA requiring equal access to 911 for the hearing impaired through special devices, called TTY or TDD, it is unclear if the ADA imposes similar requirements on 511-type services. While it is required for transit customer service centers to have TTY/TDD access, it is not common in the other types of traveler information phone systems to date, with only one non-transit centric phone system, TravInfo, having TTY/TDD access. Telecommunications Relay Services are available to the hearing impaired as a means to communicate with other people or services and this method could be used to access 511 services. *Is consistent access via TTY/TDD needed?*

Topic Area: *Hours of System Operation*

Hours of operation of existing phone services vary widely. Many, but not all, automated systems are available 24 hours a day, 7 days a week. However, information may only be updated during a more limited set of hours. Many transit information centers operate extended business day hours. *Should there be consistency associated with hours of operation?*

Topic Area: *Multi-lingual capabilities*

In some phone systems, Spanish services are available. King County (WA) METRO utilizes AT&T interpreters to help people of all languages. In August 2000, President Clinton signed an Executive Order (13166) that was aimed at improving access to government services for people with limited English proficiency that may have some implications for 511 services. *Should there be consistency associated with non-English services?*

Topic Area: *Timestamp information*

Some automated systems in operation today will indicate in the recorded message when the information was created, enabling the caller to determine how old the report is. This timestamping is done in many different ways, some of which could lead a caller to believe information is more up-to-date than it actually is. Some systems provide a timestamp for all information available based upon when the last update of any item occurred. Others timestamp each specific recorded message (e.g. a particular route). Still many other systems do not use timestamping at all. *Should there be any consistency related to timestamping information?*

Topic Area: *Roadside signing*

Roadside signing is one of the methods likely to be used to advertise and promote the availability of 511. At present, no standard practice exists for placing 511 on either fixed or dynamic signage. *Should there be a consistent approach to roadside signing promoting 511?*

5. Policy Recommendation(s)?

The initial recommendation of the Working Group is to ***adopt a philosophy of providing as much flexibility to implementers as possible at this early stage while also maximizing the chance that callers will begin to recognize the services as part of a national system.*** While more detailed investigation is needed, adopting this philosophy leads to the conclusions for each of the aforementioned topic areas as shown in Table 1.

Topic Area	Recommended Detail	Recommended Approach
System Navigation	Top-level menu tree, commands, and short cut format	Recommended Practice/ Guideline
System Access Quality	Identify a few key metrics, set targets and encourage performance measurement against these	Recommended Practice/ Guideline
Initial Greeting	Leave flexibility to implementers, but encourage reference to national system	Recommended Practice/ Guideline
Advertising/Sponsorship Rules	Leave flexible	
ADA Compliance	Leave flexible	
Hours of System Operation	System access 24/7, with system declaring if it is live or recorded mode	Recommended Practice/ Guideline
Multi-lingual capabilities	Leave flexible	
Timestamp information	Encourage timestamp, develop recommended approach	Recommended Practice/ Guideline
Roadside Signing	Establish guidelines, consider inclusion into MUTCD	Recommended Practice/ Guideline

Table 1 – Recommendations

The Working Group proposes the development of guidelines that would provide recommended approach in the above areas where consistency is desired. At present, the Working Group believes that any stronger position vis-à-vis consistency is not yet warranted. Two reasons lead to this thinking:

- We are not yet sure what consumer expectations are towards consistency. Specific consumer research should be conducted to determine stated preferences, then practical user experience should confirm or refine the results.
- Quickly establishing guidelines for use by implementers at their option could lead to consistency just as well as stronger approaches.

The Working Group recommends that once guidelines are established based upon the parameters set forth by the Policy Committee, performance measures should be established and close monitoring should occur on how well this approach is yielding desired results. It is quite possible that mid-course policy modifications will be needed and we should be prepared for that.

511 Cost Issues Overview

This paper provides information to assist the Policy Committee in examining consistency issues relating to 511. The paper contains five sections:

1. What is the issue?
2. Why is the issue important?
3. What is the breadth of experience on the issue?
4. What are alternatives?
5. Policy Recommendation(s)?

Similar papers related to content and consistency issues are also provided. While overlap between content, consistency and cost issues is inevitable, every attempt has been made to separate these issues to promote fruitful discussion of the individual issues.

This paper does not assume either public or private sector delivery of services. The discussion of cost is independent of the organizations that collect the data and provide the services.

1. What is the issue?

The FCC ruling does “not specify parameters for cost recovery,” leaving the issue to be resolved by implementers. However, the ruling clearly recognized that costs will be incurred providing services. So for each state or regional implementation, a principal question to be answered is “who pays and how?” In the national context, it is quite possible that different implementations would reach different solutions for cost recovery.

As will be discussed in this paper, one plausible approach is a pay-per-call solution. However, if callers are expected to pay for a call in one state/region and not another, this could result in confusion and dissatisfaction from the caller perspective. So from a national perspective, a significant issue is for consideration is “***should the call be free to the user?***”

A supporting issue relates to access to additional revenue raising services that might charge a fee for usage. “***Should value-added services be offered to users for a fee?***” Examples of such services could include obtaining information about points-of-interest along a corridor or generating a personalized route based on real-time information. While it is unclear the revenue potential of such services, the question for discussion is should such services be available through 511 at all, if it entails the possibility of a user fee?

2. Why the issue is important?

Funding support for the systems is critical to their success. Lack of funding could lead to reduced information being available and even prevent systems from becoming operational in many states/regions.

Clearly the method of cost recovery will have impacts on overall usage. Simple economics proves that a service free to callers will receive more usage than one in which a fee is charged, all other circumstances being equal.

To date, all traveler information telephone systems sponsored or sanctioned by public agencies have been free to the traveler (though in a few cases local toll charges or long-distance charges apply). At a high level, this has resulted in:

- A relatively few metropolitan area telephone systems that provide real-time information
- 15-25 state DOT operated road condition systems of widely varying quality and content that are often overloaded with demand in peak usage periods, and
- Transit information service centers that are costly to operate and frequently struggle to keep pace with demand.

In all cases, funding is an inhibitor to service improvement and expansion. While 511 offers a unique opportunity for service enhancement, it does not change the underlying fact of funding limitations.

If methods of funding bog down deployment, it could lead to a situation where only a few systems are deployed. This could lead the FCC in 2005 to conclude that we have not progressed as hoped and planned and that we are not using 511 “on a widespread basis for the provision of travel information services,” possibly leading, in the most extreme case, to redesignating the number for another use throughout the country. Thus even successful state/regional systems could fall victim to the consequences if funding limitations prevent enough systems to be deployed.

3. What is the breadth of experience on the issue?

There is a base of knowledge to draw from when examining this issue in many different areas.

Cost Recovery Options

To support a phone service, there are a limited number of viable approaches:

- Caller Pays
 - Per call charge
 - Surcharge on phone bill (could be a government imposed fee, or a subscription)
- Free to Caller
 - Public sector funded
 - Advertising or sponsorship supported
 - Subsidized by other revenue generating opportunities (e.g., value-added services or franchise to exclusively use the same data for other revenue-generating services)

It is possible for these methods of cost recovery to be blended together to support the system as well. For example, an implementation could be funded partially by the public sector and through sponsorship.

Wireless calling adds some complexity to the cost equation. A caller using a wireless phone may accrue air-time charges (this could be either a per minute charge or count as minutes used in a flat-rate plan), although in some cases air-time charges have been waived in existing systems. Roaming, using a wireless phone outside a caller's coverage area, also can add costs. In all cases, the caller bears these costs.

Cost Elements

We also have a reasonable understanding of the types and orders of magnitudes of costs that are associated with these types of services. Costs are of two main types: (1) information gathering and packaging and (2) call routing and communications costs.

Information gathering and packaging is usually the largest cost driver, with the following steps typical regardless of content category:

- Data Collection: Obtaining the raw data such as travel time, parking lot occupancy, schedule adherence.
- Data Fusion: Resolving conflicts from data collection systems and blending data from different content categories together
- Data Dissemination: Packaging the fused data for use, either through automated or human recordings or to support a live operator, as is the case in transit customer service centers.

One of the key points associated with information gathering and packaging is that the information can be utilized for many purposes in addition to supporting 511, including other traveler information services, transportation system management, and supporting long-range planning. Thus, 511 services may not (in fact, should not) bear the entire cost of information gathering and packaging. Also, *costs for establishing the necessary information gathering and packaging process will vary widely by state and region, with the extent of existing infrastructure being a key factor.* Regions that have good infrastructure in place will require much less investment than those that do not.

While the Working Group is attempting to establish a cost template to respond to the question “if we want to do 511, what will it cost?”, circumstances vary widely in how current phone systems have been created, funded and operated. At present, the best we can come up with is a few rules of thumb (note, these costs are independent of the basic data collection):

- Highly automated, limited or no human involvement in operation: These are the least costly systems to establish and operate. In Arizona, such a system was created for roughly \$100,000. Maintenance costs are minimal, roughly \$10,000 annually.
- Automated system, with human recorded information: These systems are typical of the metropolitan traffic/multi-modal services. To establish such a service could cost \$500,000 to \$1 million. A rule of thumb for system operations would be \$1 million annually, with that figure varying due to many factors included size of region, hours of operation, etc.
- Human operator-based system: Typical of transit information services, these systems are the most costly, as many full time staff could be required to provide the service. Many services are paying in the millions to create a trip itinerary planning system that operators can use to more quickly and accurately respond to caller inquiries. An annual operating budget for a large transit information center can exceed \$4 million.
- Telecommunications costs: In all cases, there is a cost to connect callers to the service. While there are variants to this, a good rule of thumb is \$0.25 per call, though of course it varies based on implementation. Calls can have various cost elements depending upon the type of call, as shown in figure 1.

Type of Call	Wireless Carrier	Originating LEC	Long Distance Carrier	Destination LEC	Note
Landline					
Local		x		x	Originating and destination LEC is same carrier
Long Distance		x	x	x	
Wireless					
Local	x	x		x	Originating and Destination LEC is same carrier
Long Distance	x	x	x	x	
Roaming -- Local Call	x	x		x	1. Originating and Destination LEC is same carrier 2. Caller's wireless and roaming carrier eligible for renumeration
Roaming -- Long Distance	x	x	x	x	Caller's wireless and roaming carrier eligible for renumeration

Note: Toll-free can be local, long distance, wireless or wireline; major difference in cost structure is the local toll free calls incur per minute charges

Figure 1 – Carriers Eligible for Payment by Type of Call

Other N11s

As Figure 3 illustrates, other abbreviated dialing services are funded in different ways. Based upon the experience of establishing these cost recovery mechanisms, we can conclude:

- **Funding the service through surcharges on phone bills, as is done for 911, is highly unlikely.** State Regulators receive numerous complaints regarding surcharges, even for life-saving services such as 911. It is extremely doubtful that a surcharge for 511 would be approved by state regulators.
- **Carriers will not assume the cost burden** as they do with 711. The FCC has mandated carriers must provide this service to be in compliance with the American with Disabilities Act. In the ruling for 511, the FCC did not place a similar requirement on carriers.
- **We cannot expect donations and grants to support services,** as is occurring in 211.

N11	USAGE	EXTENT OF USE	HOW PAID FOR
211	Access to organizations providing community information and referral services.	Larger cities in CT, GA, LA, TN, AL, MS, NC, OH, and UT are currently implementing.	Donations to agencies and grants.
311	Access to City or County government services (including non-emergency police). Calls answered by operators and forwarded to appropriate agency.	Larger cities in TX, AZ, IL, CA, MD, MI, NY use this service.	Funded by government providers.
411	Directory Assistance	Local phone companies, long-distance carriers and many independent providers provide this service.	User pays, usually with some calls in basic service and additional calls for fee.
711	Access to nationwide Telecom Relay Services (TRS) for individuals who are deaf, hard of hearing, or have speech disabilities.	DE, HI, MD, ME, MA, NH, NY, PA, RI, VT, DC and WV provide this service.	Costs funded by carriers.
911	Universal emergency telephone number. Connects to Public Safety Answering Point (PSAP)	Widely utilized nationally, though some communities are still using 7 or 10 digit dialing to access emergency services.	Surcharge on customer phone bill.

Figure 3 – N11 Summary

Transportation Industry Experience

In operating phone systems to provide traveler information, we have learned a few key things with respect to cost and cost recovery:

- **Advertising, sponsorship or user fees have yet to sustain a phone system service.** At present, no government sponsored phone service contains advertising. Nor is sponsorship a significant component, though in some systems, wireless carriers that waive air-time charges are recognized in the initial greeting. **Every public sector operated, sponsored or sanctioned telephone service is underwritten largely or exclusively by public sector investment.** What is not clear how increased call

volumes expected with the use of 511 could impact the market for such revenue-generating opportunities.

- ***Information gathering and packaging costs can far outweigh call routing and communications costs.*** Evidence suggests that 80-90% of the cost of a metropolitan area or statewide road conditions service can be in the gathering and packaging the content (this % is highly variable depending on circumstance). For transit information centers, the costs of operating a call center with many live operators and information system to support them could be exceed 90% of the total system cost.

Regulatory Issues

Current Federal law (Section 228 US Code, Title 47) allows only directory assistance calls to charge a per-call fee for interstate calls unless a 900 number is used. It is unclear how this law impacts intrastate calls and the potential of charging a per-call fee for 511, but it could have an impact on both charging for both basic and value-added services.

Conclusions

From this experience, we can draw the following conclusions regarding the viability of cost recovery options (note that our experience is limited to independent regional/state phone services):

- **Caller Pays**
 - Per call charge? – *No indication that this is viable.*
 - Surcharge on phone bill (could be a government imposed fee, or a subscription) – *No indication that a government imposed fee is viable; subscription service is untested, but clearly limits access to services.*
- **Free to Caller**
 - Public sector funded – *Viable, but unless funding increases significantly, is unlikely to fully support the desired service levels of content and quality.*
 - Advertising or sponsorship supported – *No indication that this is viable to completely support 511 services; could provide partial funding though.*
 - Subsidized by other revenue generating opportunities (e.g., value-added services or franchise to exclusively use the same data for other revenue-generating services) – *Has been used in the past, usually in conjunction with public sector support; success varies based on many factors, including the exact business agreement, market demographics and desired content and quality level, as well as macroeconomic factors that could encourage or discourage “risk-taking” by the private sector.*

4. What are the alternatives?

The Policy Committee has the following options to consider when addressing the two questions posed at the beginning of this paper:

Issue: *Should the call be free to the user?*

Alternatives:

- *Stay silent.* Leave to implementers to determine.
- *Discourage pay-per-call implementations.* The option of recovering costs by charging for use would be strongly discouraged. Some implications of this alternative are:
 - Ensure maximum usage and impact by eliminating a financial disincentive for use
 - Eliminate the most direct method for generating funds to support service offerings. This could lead to slower roll-out of services, limited content offerings and reduce service quality. While no government operated, sanctioned or sponsored service has charged a fee for information access to date, no other method has proved viable for supporting such services except for complete or largely public agency subsidy (which after all are funds indirectly provided by the public at large through user fees). Taking this option off the table at this stage could be regretted later on.
 - Reduce the possibility of negative consumer reaction to pay-per-call, a realistic outcome particularly if some regions charge for use and others do not.
 - Consumer resistance is strong to charging for something that was previously free. If pay-per-call is eliminated initially, it will be highly unlikely it could be invoked later if it determined the only method for suitable revenue recovery.
- *Openly encourage pay-per-call implementations, either as one or a few test implementations or as the preferred widespread approach.* Some implications of this alternative are:
 - If, for example, a \$0.25 or \$0.50 per call charge is established, economic viability of 511 services could be quite strong.
 - Consumer reaction to pay-per-call could range from open hostility to total indifference. Since the 511 “brand” has yet to be formed, consumer may not have the expectation of it being for free (after all 411 is not thought of as free).
 - It is unclear how the FCC would react to user charges. While the FCC ruling afforded flexibility in cost recovery methods, since no existing telephone service charges users, the FCC may not be expecting this approach to be used.

Issue: *Should value-added services be offered to users for a fee?*

Alternatives:

- *Silent.* Leave decisions and experimentation to implementers.
- *Encourage such services.* Adopting this approach in conjunction with encouraging the basic information available on the service to be free to the caller could afford a compromise in which revenue could be derived to support cost recovery, while the main purpose of the system would still be free.
- *Discourage such services.* If the basic call is free to users and value-added services for a fee are discouraged, then cost recovery will be limited entirely to indirect mechanisms (public agency support, advertising/sponsorship, or partnership models) If the basic call can be charged to the user, then a model based on further extracting fees for premium services may be difficult for users to accept.

5. Policy Recommendation(s)?

The Working Group recommends the following:

- *Should the call be free to the user? **Discourage pay-per-call implementations, but take the position that a per-call fee is preferable to not operating a service in a state/region.*** A policy statement that establishes a per-call fee as an option of last resort could convey the desire to lean towards other options first.
- *Should value-added services be offered to users for a fee? **Silent from policy perspective on value-added services, but make implementers aware of this option*** and that they are not being discouraged from offering such services if they so choose.

The Working Group also recommends some additional experimentation to test direct cost recovery options in the real-world. At minimum, two types of tests could be considered:

A test of a per-call fee approach should be considered to assess viability and impact on usage and overall service quality that a direct cost recovery mechanism could afford. Also, a test of charging for value-added services as a method of cost recovery should be considered to assess the viability of the model.