511 Interoperability Quick Tips

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What is 511?

- 511 Designated in July 2000 by the Federal Communications Commission (FCC)
  - U.S. DOT Petitioned the FCC for an N11 Number in March 1999

Why 511?

- More than 300 telephone traveler information systems in the U.S.
- Demonstrated value of traveler information services to the public
- 72% call volume increase N11 vs. easy 7-digit number

Who is the 511 Deployment Coalition?

- **AASHTO**
  - State Departments of Transportation
- **APTA**
  - Public Transportation Agencies
- **ITS America**
  - ITS Industry – including above agencies
- **U.S. DOT**
  - Federal leadership

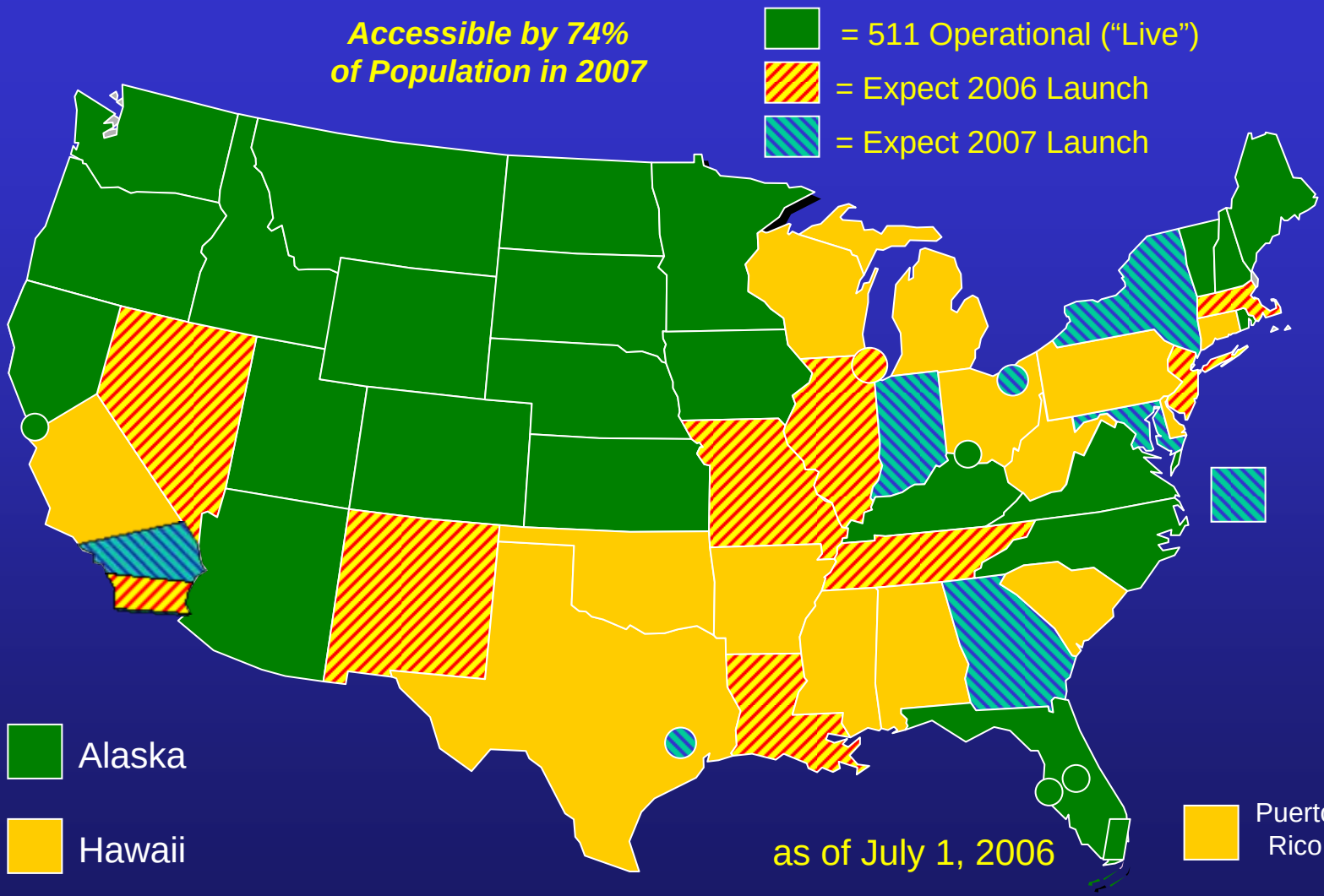
- **Policy Committee**
- **Working Group**
  - Provides National Guidance with Local Implementation
  - Generates deliverables through Task Forces

What is the purpose of the Coalition?

Deliverables:

- Guidelines Versions 1.0, 1.1, 2.0 and 3.0
- 7 Deployment Assistance Reports (DARs)
  - *DAR #4 511 Regional Interoperability*
- National Conferences
- Marketing & Outreach – national logo
- Website for Deployers – repository of 511-related material
  - *511 Interoperability Quick Tips*

511 Deployment Status



Coalition 2010 Goals

- 100% Population Coverage
- 90% Brand Awareness
- 100% Customer Satisfaction
- 511 systems will receive more than 40 million calls per year
  - 18.4 million in 2005
  - More than 12 million through May 31, 2006
- National interoperability

Interoperability Task Force Assessment

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Task Force Goals

- Make using 511 easy for those who use multiple systems
- Make access to neighboring travel information systems seamless

Defining Interoperability

Two dimensions within the 511 context –

- User's interaction with the system
  - *similar experiences across systems*

- Design and back-end operation of the system
  - *system interfaces*

Common 511 System Elements

Common system attributes include:

- User Interface
- System Content
- Types of Roads Covered
- Type of Data
- Awareness
- Main Menu Selections
- Connections to Other Systems

Common User Experience

- "Welcome to <State or Region> 511, presented by the XXXX Department of Transportation."
- "Here is a special alert from the XX Dept. of Transportation….."
- "You can say 'main menu' at any time to return to this menu, or say 'help' if you need instructions."
- "Do you want information on 'Highways', 'Public Transportation', 'Airports', or 'other states'?"

Interoperability Assessment: Results

Specific design issues & options were identified & addressed:

- Critical Design Factors
- Usability through a wider variety of "grammars" within menu selections
- System Interoperability Options
  - Call Transfer
  - Data Transfer
  - Shared Applications
  - Hybrid Systems

Examples of Common/Alternative Grammars

Highway Information	**Highways, Roadways, Roads, Road Conditions, Traffic, Interstates, Streets, Turnpike (used for specific road categories)**
Transit Information	**Transit, Public Transportation, Mass Transit, Subway, Light Rail, Buses, Streetcars (as appropriate)**
Airport Information	**Airports, Air Travel, Airlines, Flying**
Rail Station Information	**Rail, Commuter Rail, Heavy Rail, Amtrak, (others as appropriate)**
Ferry Information	**Ferries, Water Shuttle, Water Taxi, Boats, (others as appropriate)**
Help	**Help, Instructions, Assistance**

Additional Universal Instructions and/or interchangeable terms

Skip to next message	Skip, Next, Next One, Forward
Repeat last message	Repeat, Say Again, Go Back, Back, Previous
Return to Main Menu	Main Menu, Top Menu, Top Level
Interstate	I-, (in some areas, this is simply “route”)
State Route	State Highway, Highway, (in some areas, this is simply “route”), Sign Route, SR, K, etc.
US Route	US (in some areas, this is simply “route”)
Route	May be pronounced as “Root” ('rüt) or “Rout” ('raut)

Critical Design Factors

- Allow users of other systems to easily navigate through any system
- Allow users to obtain information from systems *other than* the one that they called
- It must be understood that each system is different and the data and interface requirements for each system vary.
- Deployers should allow for flexibility in the system and the data that will be available between systems.
- Users should receive as much information as is available.

Critical Design Factors (cont.)

Interoperability is also a *national goal*, as noted in the Surface Transportation Reauthorization bill:

> *– (ITS should) address traffic management, incident management, transit management, toll collection, traveler information, or highway operations systems with the goals of – Ensuring that a national **interoperable** 511 system, along with a national traffic information system that includes a user-friendly, comprehensive website, is fully implemented for use by travelers throughout the United States by September 30, 2010; …*

System Interoperability Options

- Call Transfer
- Data Transfer
- Shared Applications
- Hybrid Systems

Call Transfers Between Systems

User's call is transferred to another 511 system

- Callers acknowledge that they wish to transfer to another system
- Callers informed that they are leaving the current 511 system
- Not every system will be able to transfer back to the original system
- Attended Call Transfers are recommended, "holding" the call, until the receiving system "answers"
- System design should accommodate transfers of calls to neighboring 511 systems
  - Border areas
  - Metropolitan areas that extend across political boundaries
  - Areas with a large volume of through, tourist, or commercial traffic
- Neighboring systems should be aware of and accommodate the content of their neighboring system to the extent possible

Transferring Data Between Systems

Information is shared between two or more systems

- Transfer of data across neighboring systems can be used to insure interoperability through the use of ITS standards
- Data transfer option may also eliminate the need for call transfers between neighboring systems

Approaches

1) Data transfer might be accomplished by the 511 systems or the underlying traveler information, traffic and transit management systems
2) Replicate the design of a neighboring system within a states' 511 system
3) Data transfer through an intermediary or translation system

Transferring Data Between Systems (cont.)

Approach 2: Replicate *the design* of a neighboring system *within their own* system

- Users are given the choice of *information* for system A or system B
- If caller selects system A, the system provides same options and prompts *as if* they called system B
- Data and format of the "other" system is replicated, but calls remain on the system that the user had *called*
- *Each system* would need to provide *all* the menus and prompts from each system
- Cost for this type of system would likely be considerably higher

Transferring Data Between Systems (cont.)

Approach 3: Data transfer through an intermediary or translation system.

- Has been used to interface separately developed or legacy traffic management and traveler information systems.
- Data source interface (or DSI) receives data "translates" it into a form for the receiving system.
- Introduces another step into the process, but offers flexibility to design systems according to the needs of the each deployer.

Transferring Data Between Systems (cont.)

Data Transfer Standards

- Advanced Traveler Information System (ATIS) standards
- National Transportation Communications for ITS Protocol (NTCIP) standards for Center–to-Center interfaces
- More descriptions and discussions of ITS standards are available at: http://www.standards.its.dot.gov/standards.htm

Design Concerns

- As additional neighboring states implement 511 systems, the design for the data transfer may become problematic
- Some 511 systems may be asked to accept more information than they are able to process on a regular basis
- Determining what information to make available to users

Shared Applications

Multiple systems utilize the same 511 application and/or database

- Several deployers cooperate in development and operation of a common application for 511.
- In this case, the 511 application engine is shared by the participating agencies.
  - *interoperability is achieved by all systems operating as a single larger system*
- Might be restrictive to some systems where a more customized (detailed) offering is available.

Hybrid Systems

Deployers launch hybrid systems, utilizing data and call transfers (future deployment method)

- Systems will share a common application or database; or a more common data structure, allowing import / export of data without sharing applications or platforms.
- Systems will offer integrated call transfers where no common data structure is available.
- Users will use the same “grammars” regardless of which system they have called or are transferred to.

National 511 Service Interoperability Vision

Future focus should be on the transfer of data and/or calls, as well as hybrid situations:

- Discussions of common call transfer protocols
- Discussion of data transfer requirements, and database commonality issues and
- Consideration of existing and emerging standards in the design or evolution of a 511 system
- Discussion of shared applications for 511 systems

511 will be realized through locally deployed interoperable systems.

By 2010, individual systems will be linked together into an integrated, seamless network.

511 Resources are available at:

www.deploy511.org

http://www.deploy511.org/docs/511-dar4regioninterissues.pdf

Thank You

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