

12th World Congress
on Intelligent Transport Systems

Websites for Regional ITS Architectures

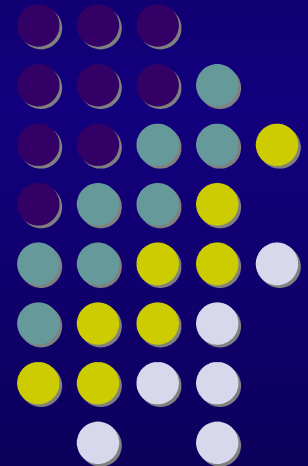
San Francisco, CA
9 November, 2005

ConSysTec Corp

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Robert S. Jaffe, Ph.D., rsj@consystec.com



Presentation Outline



Websites

Websites as a medium and collaboration tool

Developing Architectures

Websites as a tool for involving stakeholders

Maintaining Architectures

Websites as a configuration management tool

Using Architectures

Websites as a source tool for ITS Projects

Presentation Outline



- **Motivation:**
 - Involve stakeholders in the development, maintenance and use of their regional ITS architecture

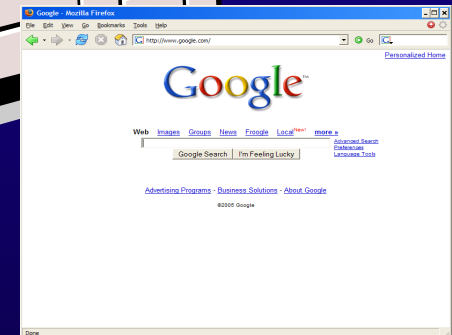
Websites (General)

Advantages:

- Easy Access
- Ease of Use

Benefits:

- Excellent medium for distributing information
- Most current information





Regional ITS Architectures

- Regional ITS Architectures
 - Shared vision of how transportation systems in a region may work together to share information and resources to provide a safer, more efficient transportation system





Regional ITS Architectures

Regional ITS Architectures (continued):

- Inherently involves many stakeholders in a region
- Can contain many details, including:
 - Stakeholders
 - ITS systems (elements)
 - information exchanges
 - transportation services
 - ITS standards
 - functional requirements
- Naturally encoded as a relational database



Regional ITS Architectures

- Given multiple stakeholders and the large amount of detailed information, websites are an ideal MEDIUM for hosting regional ITS architectures.
 - Relational databases can be naturally encoded into websites with hyperlinks to show the relationships
 - Websites are excellent electronic document libraries
 - one stop shop for information about a regional ITS architecture.
 - can be linked to by other stakeholders' websites.
 - low costs



Developing Regional ITS Architectures

Vital to keep stakeholders involved with the development process.

- Allows participation even if stakeholder is unable to attend all meetings





Developing Regional ITS Architectures

Websites serve as a clearinghouse for information

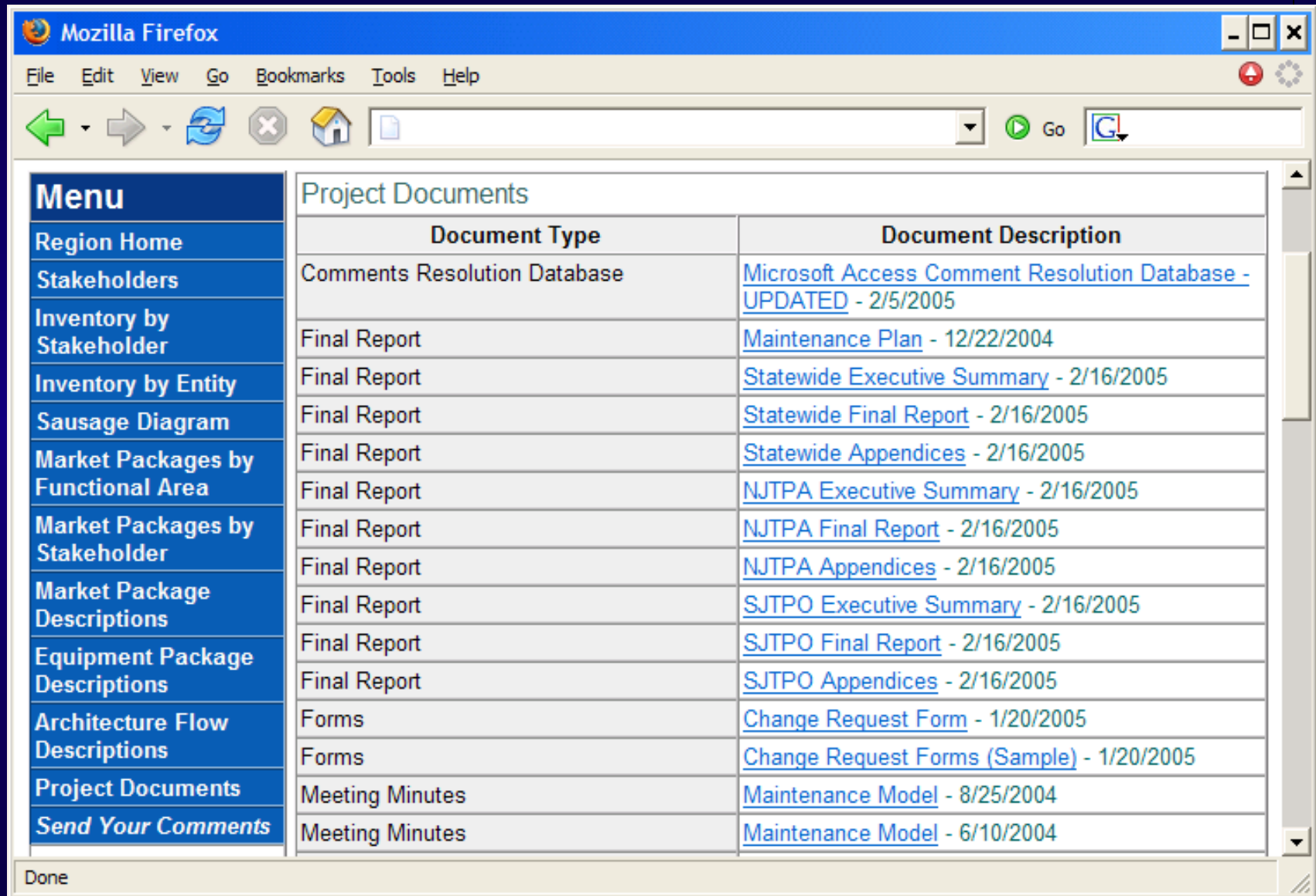
- Provide up-to-date information and progress
- Provide meeting minutes, presentation materials, and draft documents

Developing Regional ITS Architectures



The screenshot shows a Mozilla Firefox browser window with the address bar set to <http://www.consystem.com/tsdea/rstwg/docs.html>. The page title is "What's New". On the left, there is a "PROJECT LINKS" sidebar with the following links: Home Page, What's New, Calendar, Public Documents, RSTWG Log-In, Related Links, and E-mail Support. The main content area has the heading "What's New" and a welcome message: "Welcome to the New York Metropolitan Area Transit Schedule Data Exchange Architecture (TSDEA) Website!". Below this, it states: "This page lists what's new on the TSDEA website." The page then lists two updates: "November 2, 2005 - Updated the [calendar](#) to announce a teleconference on November 19, and a RSTWG meeting on November 29." and "October 18, 2005 - Posted the draft Concepts of Operations document(with the specific Use Cases included as appendices) for the Schedule Data Profile in the RSTWG Projects Document webpage <http://www.consystem.com/tsdea/rstwg/docs.html>. The Concept of Operations will provide the starting point for defining the detailed Requirements Document that we hope to have available for review in late November. A teleconference to discuss the draft document is scheduled for October 20, 2005 (See the calendar webpage at <http://www.consystem.com/calendar.php>. Also posted the minutes and presentation slides from the September 22, 2005 RSTWG meeting in the RSTWG Project Document webpage <http://www.consystem.com/tsdea/rstwg/docs.html>." At the bottom left, it says "Last updated: 11-02-05". The status bar at the bottom shows "Done".

Developing Regional ITS Architectures



Menu

- Region Home
- Stakeholders
- Inventory by Stakeholder
- Inventory by Entity
- Sausage Diagram
- Market Packages by Functional Area
- Market Packages by Stakeholder
- Market Package Descriptions
- Equipment Package Descriptions
- Architecture Flow Descriptions
- Project Documents**
- Send Your Comments

Project Documents

Document Type	Document Description
Comments Resolution Database	Microsoft Access Comment Resolution Database - UPDATED - 2/5/2005
Final Report	Maintenance Plan - 12/22/2004
Final Report	Statewide Executive Summary - 2/16/2005
Final Report	Statewide Final Report - 2/16/2005
Final Report	Statewide Appendices - 2/16/2005
Final Report	NJTPA Executive Summary - 2/16/2005
Final Report	NJTPA Final Report - 2/16/2005
Final Report	NJTPA Appendices - 2/16/2005
Final Report	SJTPO Executive Summary - 2/16/2005
Final Report	SJTPO Final Report - 2/16/2005
Final Report	SJTPO Appendices - 2/16/2005
Forms	Change Request Form - 1/20/2005
Forms	Change Request Forms (Sample) - 1/20/2005
Meeting Minutes	Maintenance Model - 8/25/2004
Meeting Minutes	Maintenance Model - 6/10/2004

Done



Developing Regional ITS Architectures

Well-designed websites should:

- Present only that information relevant to the user...and ignore the rest
- Allow users to logically search for detailed information, possibly via hyperlinks
- Allow users to save, distribute or print information in a universal format

Developing Regional ITS Architectures

The screenshot shows a Mozilla Firefox browser window with the address bar set to a local file path. The page content is organized into a sidebar menu and a main content area.

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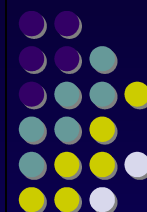
Inventory by Stakeholder

[\(PDF Version\)](#)

Stakeholder	Element
Amtrak	Amtrak Emergency Response Vehicles
	Amtrak Police Dispatch
	Amtrak Customer Information System
	Amtrak Fare Management System
	Amtrak Website
	Amtrak Trains
	Amtrak / Shore Line East Operations Center
Archive Data Users	Archived Data Users
	Transit Database Users
Commercial Vehicle Operators	Private Fleet Management Systems
	Commercial Vehicles
ConnDOT	ConnDOT 511 System
	ConnDOT Public Transportation Management System
	ConnDOT RWIS Sensors
	ConnDOT Ramp Meters
	ConnDOT Maintenance and Construction Districts

Done

Developing Regional ITS Architectures



Mozilla Firefox


File Edit View Go Bookmarks Tools Help

Go

Menu

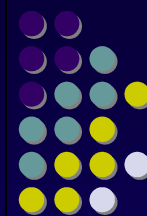
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ITS Element: NYSDOT R11 Field Equipment

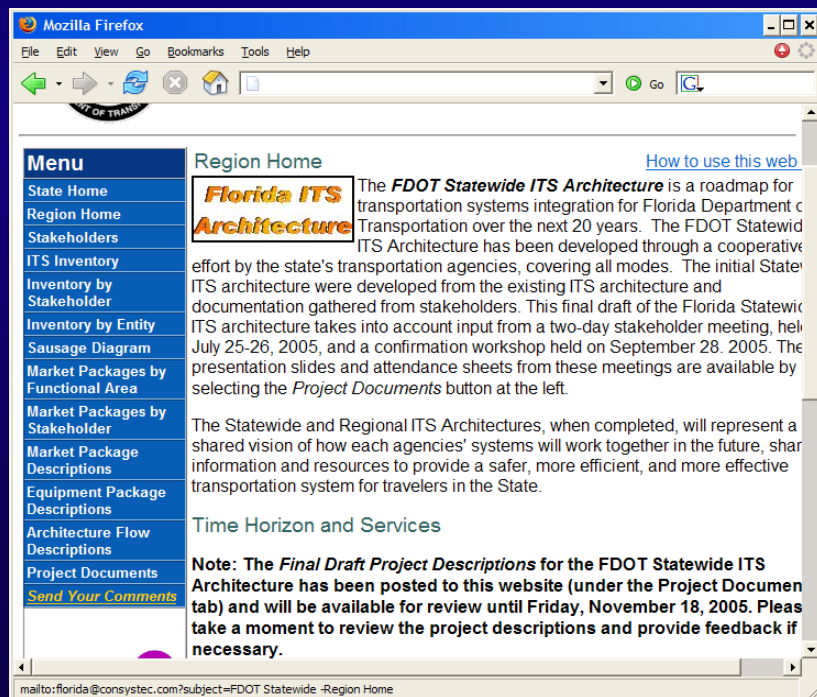
Description:	Field equipment including traffic signals, dynamic message signs, highway advisory radio, ramp meters, CCTV, and portable equipment.
Status:	Existing
Stakeholder:	NYSDOT - New York State Department of Transportation
Mapping:	Roadway Subsystem Other Roadway
Interfaces:	 New York City Joint TMC NYSDOT Maintenance Operations NYSDOT R10 INFORM NYSDOT R8 Hudson Valley Traveler TOC
Market Packages:	ATMS01 - Network Surveillance ATMS04 - Freeway Control ATMS06 - Traffic Information Dissemination MC03 - Road Weather Data Collection
Equipment Packages:	Roadway Basic Surveillance Roadway Environmental Monitoring Roadway Freeway Control Roadway Probe Beacons Roadway Traffic Information Dissemination

Done

Developing Regional ITS Architectures



The ability for stakeholders to provide feedback is
KEY!



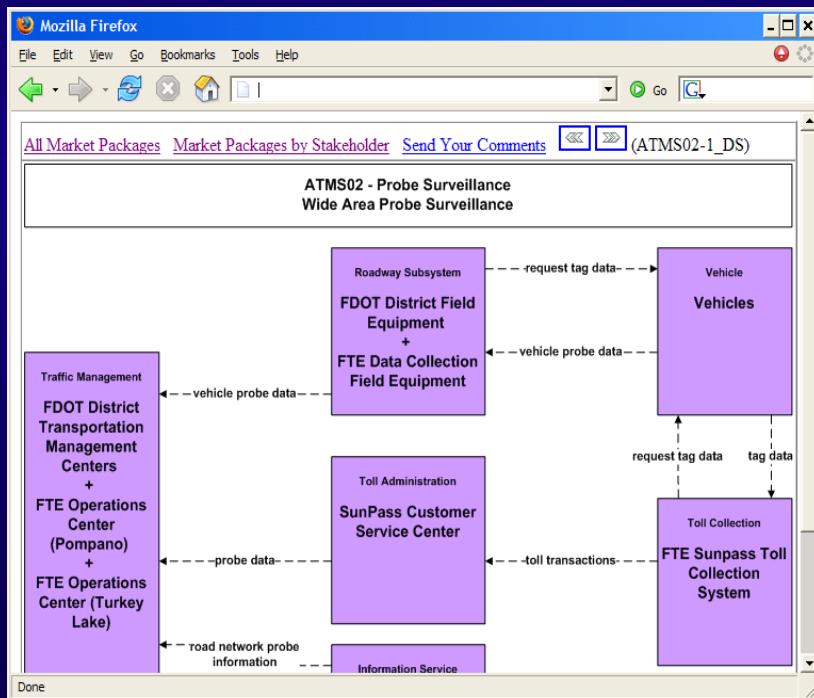
- Website must provide the ability for users to quickly provide feedback
- Developers must collect the feedback accurately, track it and provide a response

Developing Regional ITS Architectures

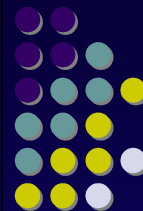


Well-designed websites should:

- Provide a feedback link on every webpage
- Automatically fill-in relevant information – who receives the feedback and which webpage is being viewed



Maintaining Regional ITS Architectures



A regional ITS Architecture is not a static product. It should be updated to reflect:



- New goals, priorities, and strategies
- New needs and transportation services
- ITS projects that are implemented



Maintaining Regional ITS Architectures

Most regions will have a change management process to update the regional ITS architecture!

- Submit proposed changes
- Track proposed changes
- Review proposed changes
- Update the regional ITS architecture
- Inform stakeholders of the update



Maintaining Regional ITS Architectures

How can websites help with maintaining architectures?

- Submit proposed changes
 - Provide hyperlinks to submit changes
 - Provide forms to submit changes
- Track proposed changes
 - Automatically store on a database
 - Include disposition
 - Provide viewing access to users

Maintaining Regional ITS Architectures

Adobe Acrobat - [CRForm.pdf]

File Edit Document Tools View Window Help

New Jersey ITS Architecture Program

Change Request (CR) Form

Originator Name:		Date Submitted
Originator Telephone:	Originator Fax:	Originator E-Mail:
Originator Agency:		Architecture: <input type="checkbox"/> Statewide <input type="checkbox"/> NJTPA <input type="checkbox"/> SJTPO
Agency Authorized Signature:		Signature Date:

Description of Proposed Change:

Rationale for Proposed Change:

Affected Agency:	Authorized Signature:	Signature Date:
Affected Agency:	Authorized Signature:	Signature Date:

List Attachments:

Baseline Documents Affected:			
<input type="checkbox"/> Website	<input type="checkbox"/> Turbo Architecture	<input type="checkbox"/> Customized MPs	<input type="checkbox"/> Document
<input type="checkbox"/> Other (describe)			

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Maintaining Regional ITS Architectures

comment02052005.pdf (application/pdf Object) - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

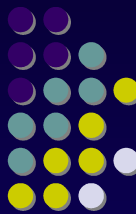
← → ↺ × 🏠 📄 | 🔍 Go

New Jersey Comment Resolution Database

No.	Submitted	Submitted By	Agency	E-Mail	Telephone	Webpage	Comment	Resolved	Resolution
1	6/16/2004	RSJ	ConSysTec	rsj@consystec.com (914) 248-3486	MP ATMS21-1 (So)		In the title, change "South Jersey Turnpike Authority" to "South Jersey Transportation Authority"	7/1/2004	The title has been changed to "South Jersey Transportation Authority"
2	6/16/2004	RSJ	ConSysTec	rsj@consystec.com (914) 248-3486	SJTA/ACESP TOC (St)		Please break this ITS element into its component TOC and SP ITS elements, and make sure the interface between them is exposed and documented. This is so that if the TOC function is relocated, the interface to the SP patrolling the ACE is shown.	7/2/2004	Renamed Emergency Management subsystem functions to ACESP Dispatch (Stakeholder is NJSP), renamed Traffic Management subsystem functions to SJTA TOC, and renamed Maintenance and Construction subsystems to SJTA TOC - Maintenance functions to SJTA TOC - Maintenance (St).
3	6/17/2004	RSJ	ConSysTec	rsj@consystec.com (914) 248-3486	MP ATMS07-01 (No)		Please delete this market package as per stakeholder consensus at the 6-17-04 workshop.	7/1/2004	This customized market package diagram has been deleted. However, please be aware another, but different, customized market package may be renamed "ATMS07-01 (No)" in the August 10, 2004 update of the ITS architectures.
4	6/19/2004	RSJ	ConSysTec	sj@consystec.com (914) 248-3486	MP ATMS08-03 (So)		The emergency management element "DRPA Police (No)" should be renamed "DRPA Police (So)". I'm sending this comment for Karl Ziemer.	7/29/2004	The suffix for all ITS elements have been removed to minimize confusion. Only the customized market package diagrams have been assigned to either the NJTPA, SJTPD, or Statewide ITS Architecture.
5	6/19/2004	RSJ	ConSysTec	sj@consystec.com (914) 248-3486	NJ - Inventory by Stakeholder		The following comment is being sent for Karl Ziemer. ALL ITS elements for the "DRPA - Delaware River Port Authority", need to be identified as "(So)".	7/1/2004	The suffix for all ITS elements have been removed to minimize confusion. Only the customized market package diagrams have been assigned to either the NJTPA, SJTPD, or Statewide ITS Architecture.
6	6/21/2004	Steven Burke	DRPA	SBurke@drpa.org (856) 968-2092	NJ - MP APTS4-2a (No)		With regards to DRPA/PATCO, For APTS 4 - Transit Passenger and Fare Payment, the DRPA/PATCO Fare Management System is labeled as "(No-So)". This does not seem appropriate, since PATCO is wholly contained within the DVRPC region. I think we should be	7/1/2004	The suffix for all ITS elements have been removed to minimize confusion. Only the customized market package diagrams have been assigned to either the NJTPA, SJTPD, or Statewide ITS Architecture.

1 of 37 11 x 8.5 in

Stopped



Maintaining Regional ITS Architectures

How can websites help with maintaining architectures?

- Review proposed changes
 - Provide access to forms and proposed changes
 - Electronic voting
- Update the regional ITS architecture
 - Website with updated architecture can be reviewed by users
- Inform stakeholders of the update



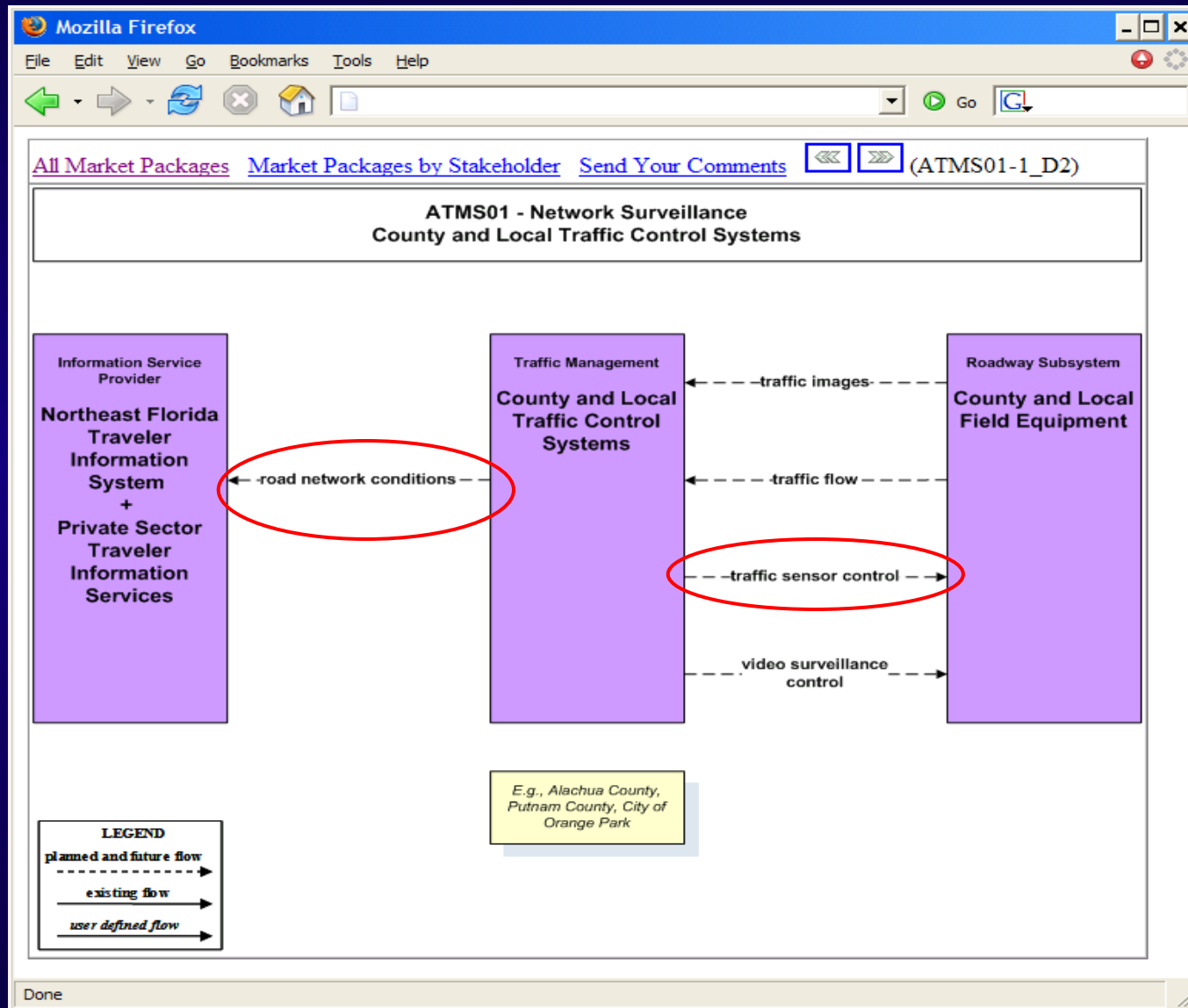
Using Regional ITS Architectures

ITS Project definition using ITS architecture:

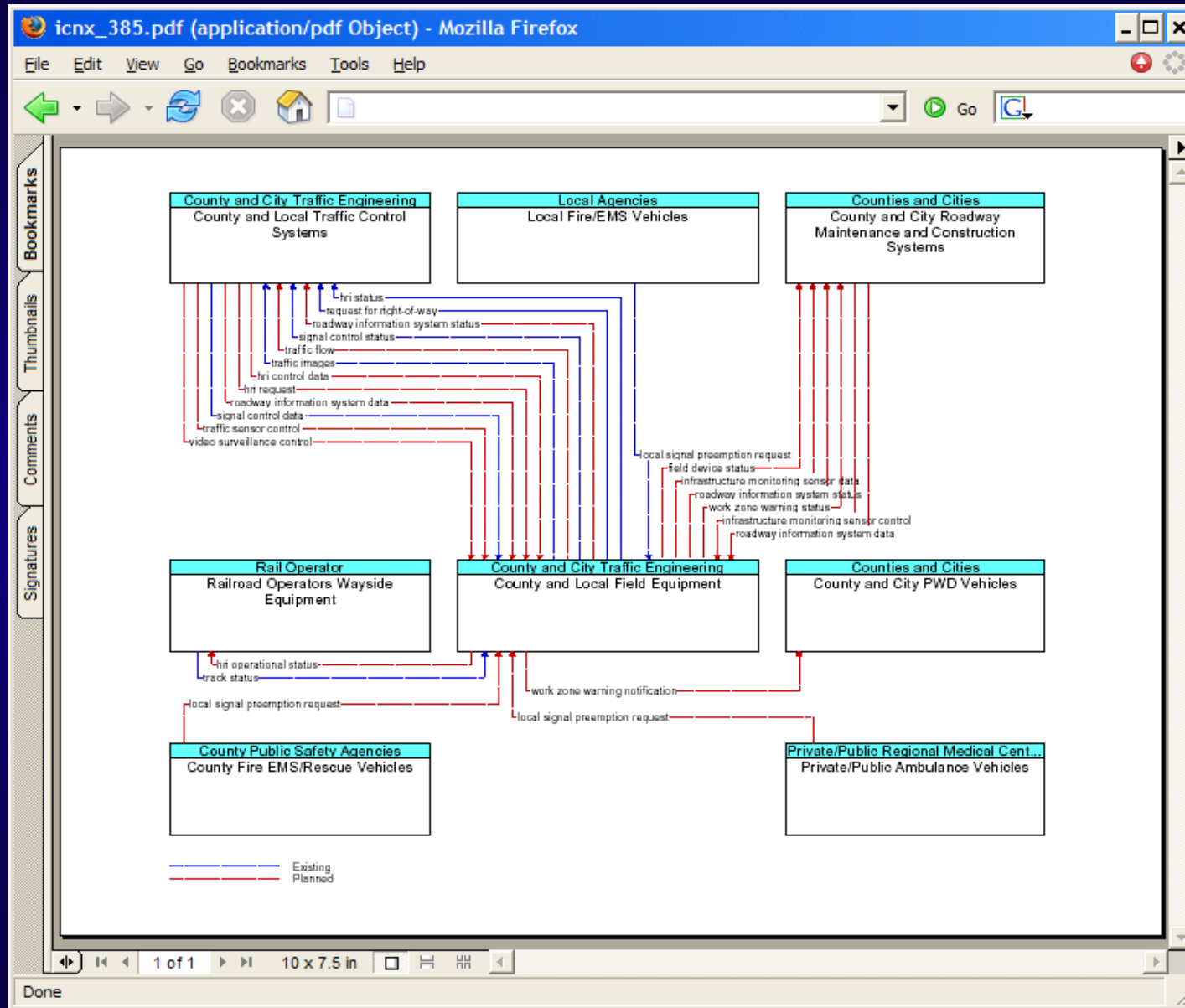
- Types of information to be exchanged between ITS elements (systems)
- System functional requirements
- Linkage to ITS standards, which may be used to develop more detailed project specifications

Using Regional ITS Architectures

- Information Exchanges



Using Regional ITS Architectures



Using Regional ITS Architectures

- System Functional Requirements



Mozilla Firefox

File Edit View Go Bookmarks Tools Help

Equipment Package: Roadway Basic Surveillance

Description:	This equipment package monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
Included In:	County and Local Field Equipment
Functional Requirements	<ol style="list-style-type: none">1 - The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.2 - The field element shall collect, process, and send traffic images to the center for further analysis and distribution.3 - The field element shall collect, digitize, and send multimodal crossing and high occupancy vehicle (HOV) lane sensor data to the center for further analysis and storage.4 - The field element shall return sensor and CCTV system operational status to the controlling center.5 - The field element shall return sensor and CCTV system fault data to the controlling center for repair.

Last updated: 10-22-05

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Done

Using Regional ITS Architectures

- Linkages to ITS Standards



Architecture Flow: signal control data

Description:
Information used to configure and control traffic signal systems.

Communications Standards:

NTCIP C2F	AASHTO-17	File Transfer Protocol (FTP) Application Profile	NTCIP 2303
NTCIP C2F	AASHTO-18	Trivial File Transfer Protocol (TFTP) Application Profile	NTCIP 2302
NTCIP C2F	AASHTO-21	Octet Encoding Rules (OER) Base Protocol	NTCIP 1102
NTCIP C2F	AASHTO-28	Ethernet Subnetwork Profile	NTCIP 2104
NTCIP C2F	AASHTO-30	Point-to-Point Protocol Over RS-232 Subnetwork Profile	NTCIP 2103
NTCIP C2F	AASHTO-31	Transportation Transport Profile	NTCIP 2201
NTCIP C2F	AASHTO-38	Transportation Management Protocols (TMP)	NTCIP 1103
NTCIP C2F	AASHTO-47	Point to Multi-Point Protocol Using FSK Modem Subnetwork Profile	NTCIP 2102
NTCIP C2F	NEMA TS3.2	Simple Transportation Management Framework (STMF)	NTCIP 1101
NTCIP C2F	NEMA-TS3.p	Point to Multi-Point Protocol Using RS-232 Subnetwork Profile	NTCIP 2101
NTCIP C2F	S-85	Simple Transportation Management Framework (STMF) Application Profile	NTCIP 2301
NTCIP C2F	S-88	Internet (TCP/IP and UDP/IP) Transport Profile	NTCIP 2202

Message Standards:

AASHTO-42	AASHTO-42	Field Management Stations - Part 1: Object Definitions for Signal System Masters	NTCIP 1210
NEMA TS3.4	NEMA TS3.4	Global Object Definitions	NTCIP 1201
NEMA TS3.5	NEMA TS3.5	Object Definitions for Actuated Traffic Signal Controller Units	NTCIP 1202

Done

Summary



Websites hosting regional ITS architectures:

- Naturally represent existing relationships in ITS architectures
- Provides easy access to relevant, detailed information
- Relatively low cost for high benefits
- Clearinghouse for an architecture maintenance process
- Functional requirements

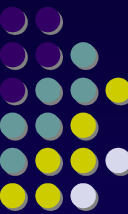
Summary



Most Importantly:

- Is a powerful tool for engaging stakeholders
 - Allows interaction with stakeholders through feedback

Summary



However:

- A website alone is not a stable baseline (because websites are so easily changed)
- A CDROM of the website to document a baseline for planning and deployment purposes.

Summary



Workshop on Using Regional ITS Architectures

ITS America, RITE Forum

Fort Lauderdale, Florida

28 February – 1 March, 2006

Register at www.itsa.org



Thank You!

- Patrick Chan, P.E., patrick.chan@consystec.com
- Manny Insignares, manny.insignares@consystec.com
- Robert S. Jaffe, Ph.D., rsj@consystec.com

www.consystec.com