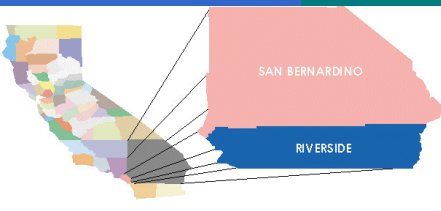


Workshop #4

Inland Empire Regional ITS Architecture Project

May 7, 2003



Agenda

- Introductions
- Recap of Project Background
- Needs, Services, and Operational Concepts
- Functional Requirements and System Interfaces
- Project Sequencing, Agency Agreements, and Architecture Maintenance
- Next Meeting/Calendar Review



Project Background

What is ITS?

Intelligent Transportation Systems

**Uses electronics,
communications, and computers
in an integrated manner to
improve the efficiency and safety
of roadways.**

ITERIS



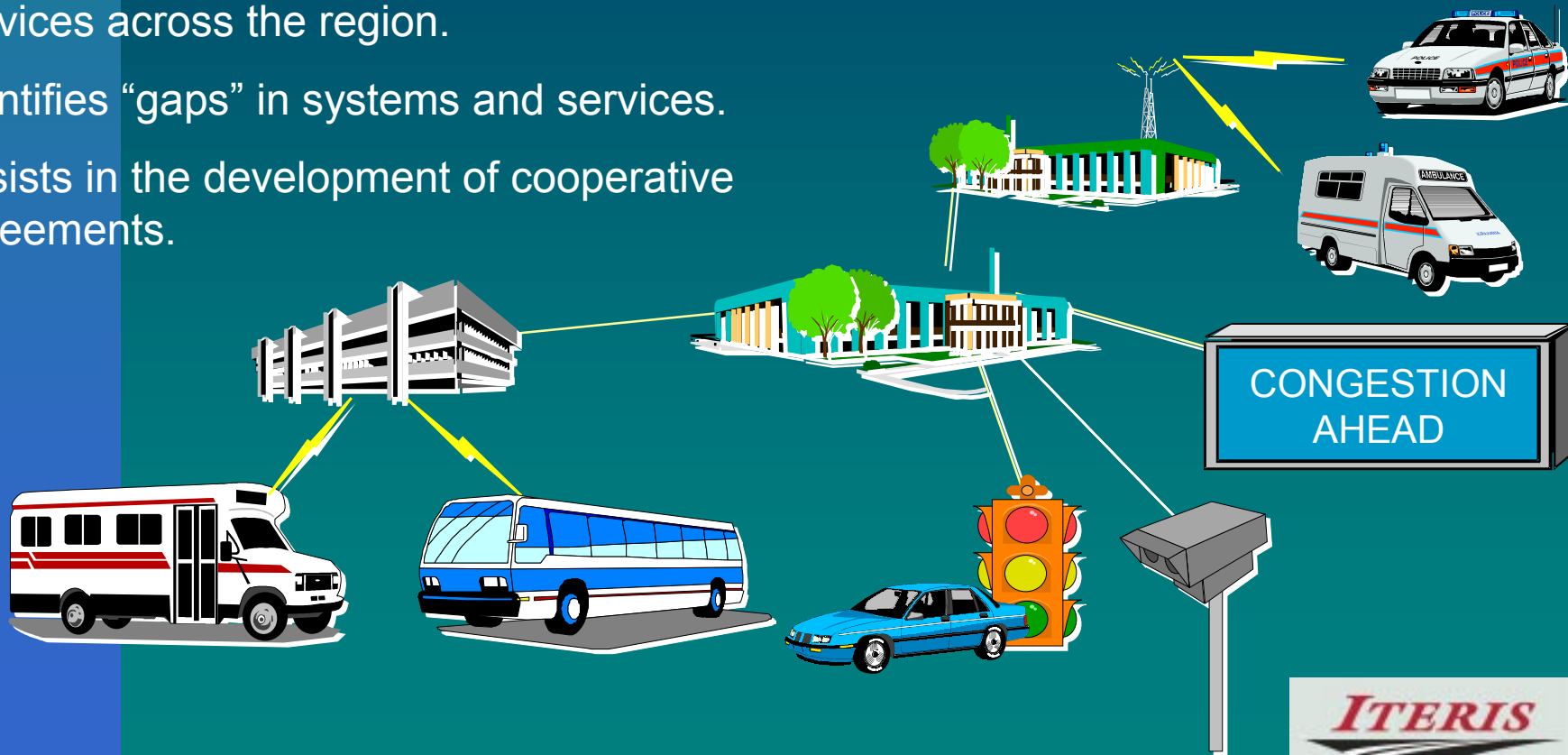
What is a Regional ITS Architecture?

Provides a structured framework for deployment and integration.

Helps to introduce and interconnect ITS services across the region.

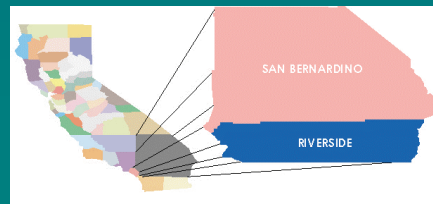
Identifies “gaps” in systems and services.

Assists in the development of cooperative agreements.



What does a Regional ITS Architecture include?

- Description of the Region
- List of Stakeholders
- Current and Future ITS Elements
- Information Exchange between the ITS Elements
- Operational Concept for the ITS Services
- Functions of each of the ITS Elements
- Applicable ITS Standards
- Project Sequencing
- List of Agreements

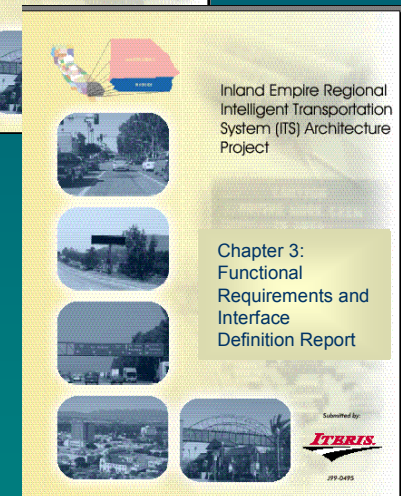
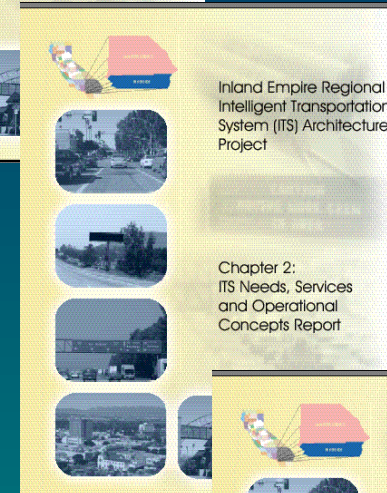
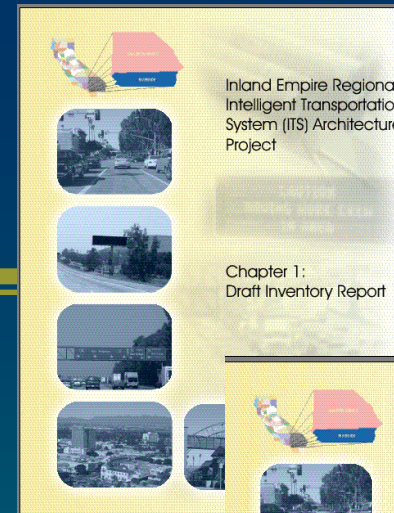


Project Work Scope

Task 1	Project Management
Task 2	Develop Steering Committee and Identify Stakeholders
Task 3	Define Region and Update ITS Inventory
Task 4	Determine Needs, Services, and Operational Concepts
Task 5	Analyze Functional Requirements and Define Interfaces
Task 6	Develop Project Sequencing
Task 7	Develop List of Agency Agreements
Task 8	Develop Maintenance Plan
Task 9	Produce Final Report

Deliverables

- Chapter 1
 - Inventory Report
- Chapter 2
 - ITS User Needs, Services & Operational Concepts
- Chapter 3
 - Functional Requirements & Interface Definitions
- Chapter 4
 - Project Sequencing
- Chapter 5
 - List of Agency Agreements
- Chapter 6
 - ITS Architecture Maintenance Plan



Deliverables

- Final Report:
 - Combines Chapters 1 through 6, incorporating all comments
 - Adds a Regional Perspective Section
 - Addresses ITS Standards

Architecture Terms

- Stakeholders →
- Inventory
- Needs
- Services
- Operational Concepts
- Functional Requirements
- System Interfaces and Flows

Entities that own/operate transportation systems or have an interest in regional transportation issues



Architecture Terms

- Stakeholders
- Inventory →
- Needs
- Services
- Operational Concepts
- Functional Requirements
- System Interfaces and Flows

Collection of transportation systems for which there is an opportunity for integration



Architecture Terms

- Stakeholders
- Inventory
- Needs →
- Services
- Operational Concepts
- Functional Requirements
- System Interfaces and Flows

List of regional
transportation problems
and challenges



Architecture Terms

- Stakeholders
- Inventory
- Needs
- Services →
- Operational Concepts
- Functional Requirements
- System Interfaces and Flows

Things that can be done to improve the efficiency, safety, and convenience of the regional transportation system



Architecture Terms

- Stakeholders
- Inventory
- Needs
- Services
- Operational Concepts →
- Functional Requirements
- System Interfaces and Flows

Definition of each stakeholder's role in providing ITS services



Architecture Terms

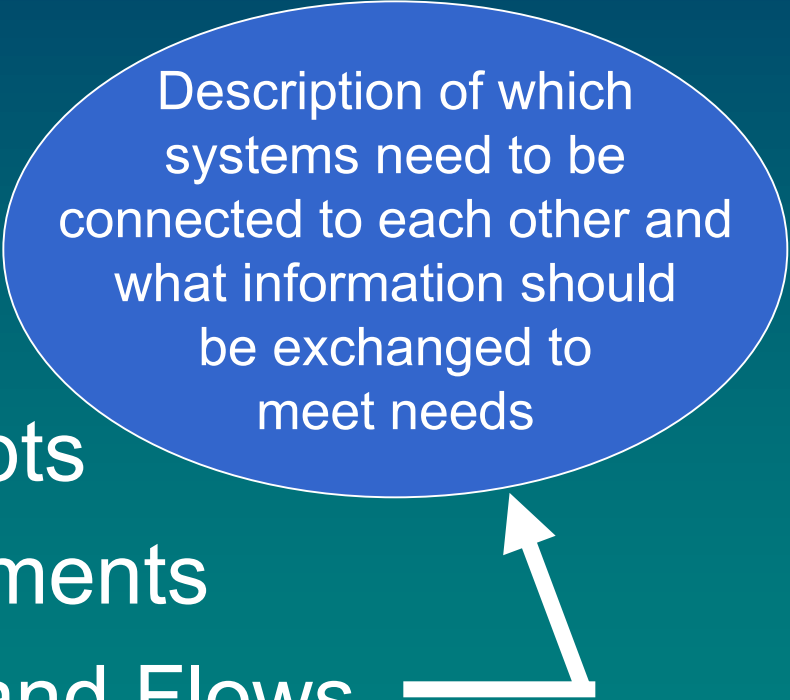
- Stakeholders
- Inventory
- Needs
- Services
- Operational Concepts
- Functional Requirements →
- System Interfaces and Flows

Tasks or activities performed by each system in the region



Architecture Terms

- Stakeholders
- Inventory
- Needs
- Services
- Operational Concepts
- Functional Requirements
- System Interfaces and Flows



Description of which systems need to be connected to each other and what information should be exchanged to meet needs



ITS Needs, Services, and Operational Concepts

ITS Needs

- Sorted by ITS Category
 - Arterial/Traffic Management
 - Freeway Management
 - Public Transportation Management
 - Emergency Management
 - Maintenance & Construction Operations
 - Traveler Information
 - Commercial Vehicle Operations
 - Electronic Payment Systems
 - Advanced Vehicle Control & Safety Systems
 - Integration (catch-all category)



ITS Needs

- Sorted by ITS Category....
- Then:
 - Reviewed with Stakeholders
 - Arrived at 85 Needs
 - Prioritized (L-M-H)



ITS Services

- Compared Inland Empire (IE) Needs to List of Services (i.e. Market Packages)
 - Existing or Planned in the IE
 - Identified IE Need
 - No IE Need
 - IE Need Indeterminate
- Resulted in Understanding of MPs to Select for Interfaces



Operational Concepts

- Defines IE Stakeholder Role and Responsibility
- By Inland Empire Agency:
 - California Highway Patrol
 - Local Police, Fire, Ambulance
 - Caltrans D8
 - County Emergency Agencies
 - Local City and County Traffic Ops
 - Transit Operators
 - Commercial Vehicle Operators



Example Operational Concept – Caltrans D8

- Manage traffic on freeway on-ramps and Caltrans controlled highways using traffic signals including preemption for emergency
- Monitor traffic on freeway on-ramps and Caltrans controlled highways
- Provide traffic and incident information to drivers
- Implement traffic control response to incidents
- Coordinate traffic control response to incidents with emergency and traffic agencies
- Share traffic information with other emergency and transportation agencies
- Share control of field equipment with other transportation and emergency agencies
- Maintain field equipment
- Provide resources when requested by emergency management agencies
- Coordinate road closures with other agencies
- Maintain centralized emergency management systems software and systems
- Maintain centralized signal systems and software
- Receive signal priority requests from transit operators (where applicable)
- Provide transit signal priority requests (where applicable)
- Determine maintenance vehicle locations
- Send location information to agency center
- Maintain vehicle status for deployment
- Send status information to agency center
- Maintain AVI/AVL systems for maintenance vehicles
- Monitor weather conditions with available CCTV and RWIS sensors and provide road weather conditions to other agencies
- Provide snowplow operations support and availability information for other agencies (CHP, county sheriff, etc.)
- Update Information to ISP and Media Outlets (web sites, TV, etc.) and issue alerts on CMS and HAR equipment
- Install CCTV cameras, CMS and HAR along the freeways
- Share freeway CCTV, CMS and HAR equipment and its control with partner agencies
- Maintain systems
- Maintain resource database updated for others to monitor

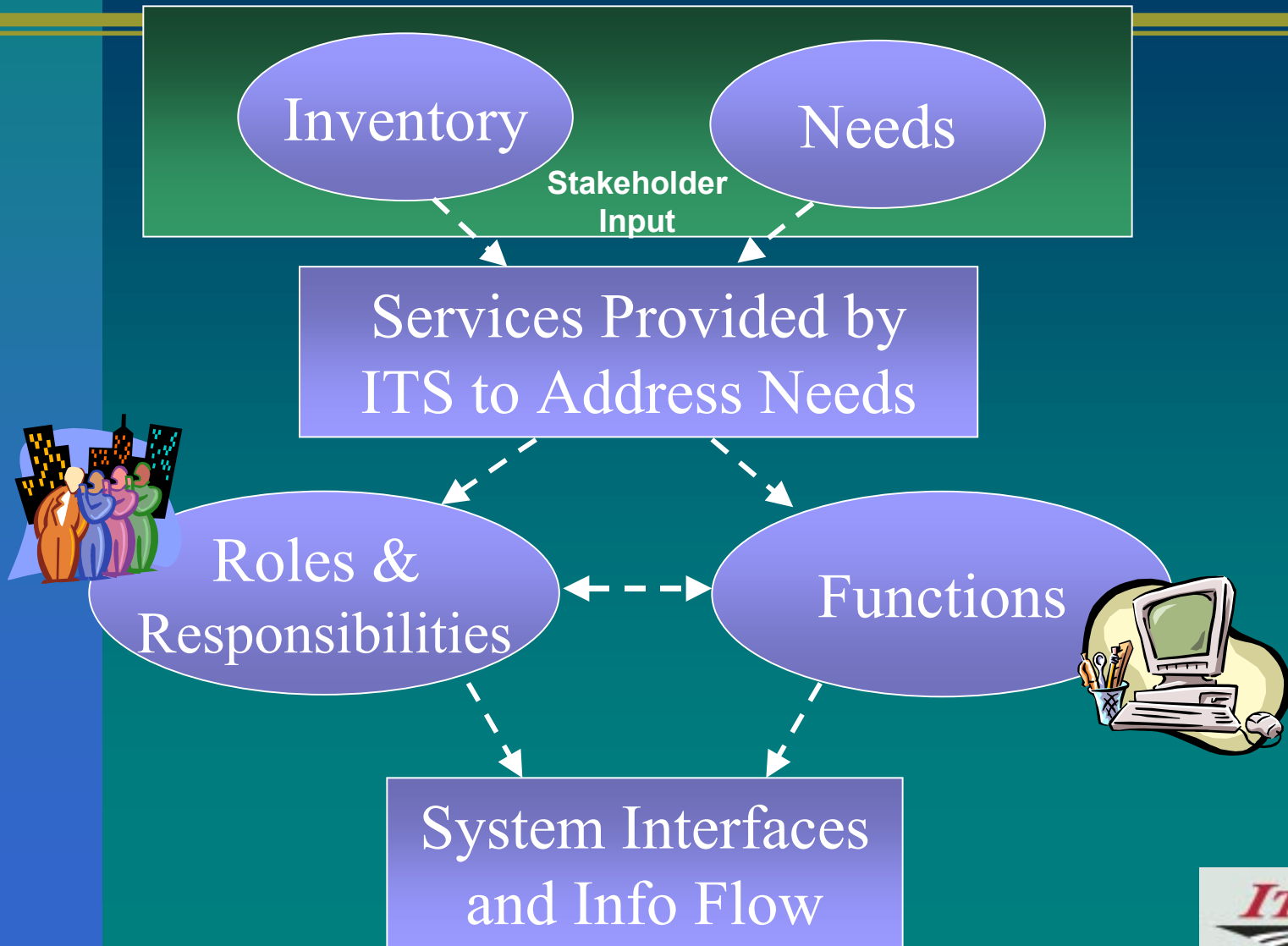
Functional Requirements and System Interfaces

Functional Requirements

- Steps:
 - Identify the systems, existing or planned.
 - Use the regional needs and operational concepts to determine what the systems need to do.
- Refer to Chapter 3 Report



Architecture Process



TurboArchitecture

- Software tool that supports development of regional and project ITS architectures using the National ITS Architecture as a starting point.
- Uses ITS inventory as input; output includes reports, diagrams, and preliminary architecture.

Interconnect vs. Flow Diagrams

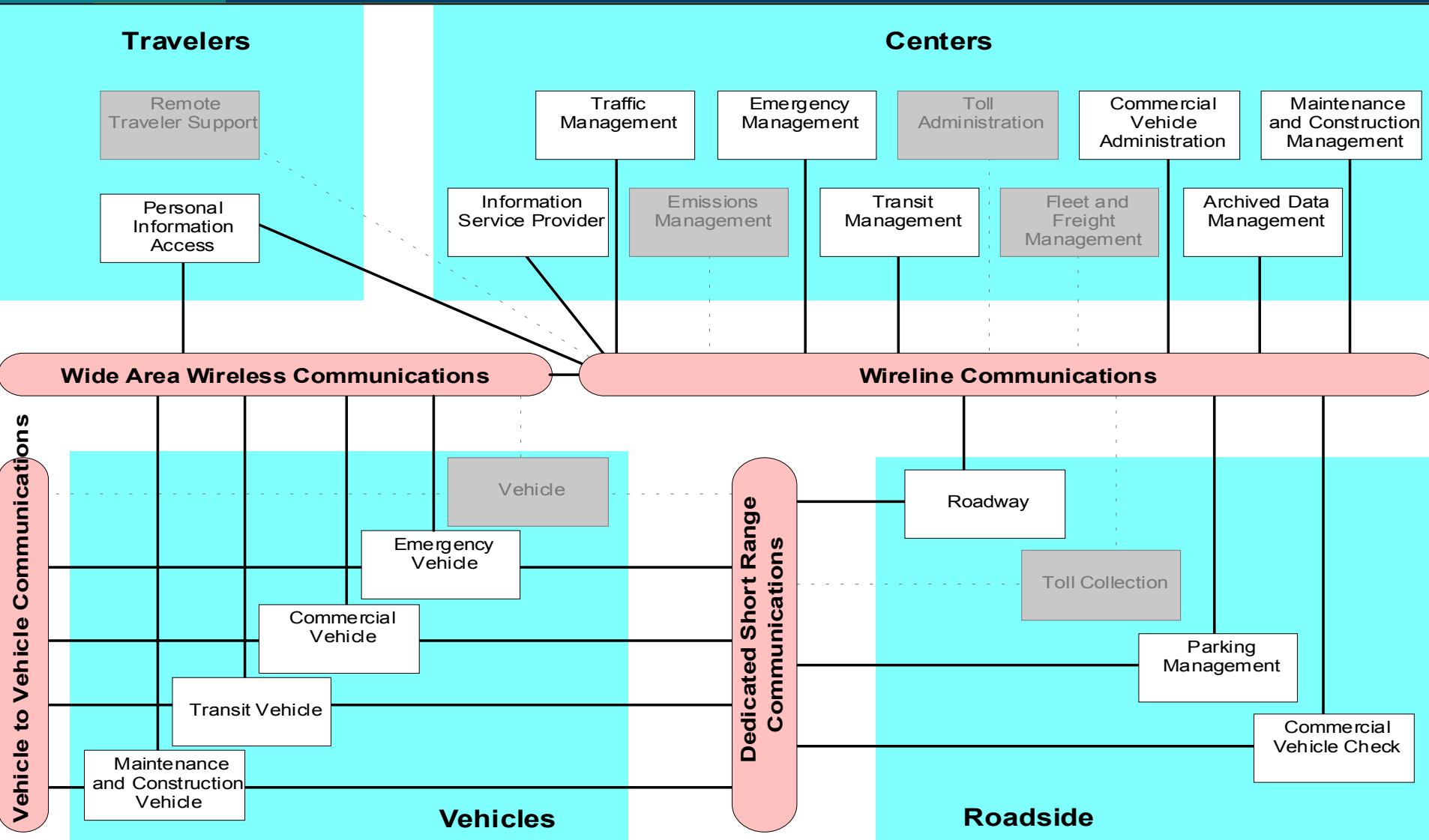
- Interconnects = physical or logical connections between systems
- Information Flows = content of data exchanged over the interconnect



“Sausage” Diagram

- A diagram which depicts all subsystems in the National ITS Architecture and the basic communication channels between these subsystems.
- The sausage diagram is a top-level architecture interconnect diagram.

Inland Empire "Sausage" Diagram



System Interfaces/Information Flows

- Refer to Chapter 3 Report



Project Sequencing,
Agency Agreements,
and Architecture Maintenance

Project Sequencing



- Provides a Path to Regional ITS Implementation
- Needs to be Factored into Traditional Regional Planning Methods
- Demonstrates how Regional ITS Architecture Supports the Life Cycle of a Project



Project Sequencing



■ Steps:

- Identify regional technical and institutional gaps and issues.
- Review any existing planning documents for ITS “pieces”.
- Develop list of activities/projects to resolve gaps and issues.
- Rate the projects for implementation as short, medium, and long-term.
- Develop project sequencing and dependencies.

Project Sequencing



- Project Focus:
 - Interconnect Gaps
 - Data Flow Needs
 - Regional Systems
 - System Management
 - Infrastructure



Project Sequencing



■ Some Examples:

- Multi-Jurisdictional Regional Arterial Management
- Regional Transportation Status Web Site
- Smart Corridor Traffic Management
- Arterial-Based Network Surveillance
- Transit Traveler Information and Security System
- Advanced Parking Information System
- Transit Signal Priority
- Incident Response and Management



Agency Agreements



- Each connection between systems represents cooperation between stakeholders.
- An agreement may be necessary to realize regional integration.
- Doesn't mean that 100's of connections equals 100's of agreements.



Agency Agreements



- Steps:
 - Compile any existing agreements.
 - Create list of agreements based on interconnects.
 - Determine agreement type and sample clauses.
 - Provide a few sample agreements.



Agency Agreements



- Agreement Types:
 - Handshake Agreement
 - Memorandum of Understanding
 - Interagency Agreement
 - Intergovernmental Agreement
 - Operational Agreement
 - Funding Agreement



Agency Agreements



- Agreement Focus:
 - Scope of Service
 - Info to be Exchanged
 - Responsibility for Components
 - Authority to Execute
 - Should be Technology Independent



Architecture Maintenance



- Two Purposes:
 - Use of the Plan
 - Maintain the Plan



Architecture Maintenance



- Use of the Plan:
 - When Developing the Regional Transportation Plan and Long Range Planning Documents
 - When Trying to Promote System and Inter-Jurisdictional Integration
 - During Project Definition and RFP Development



Architecture Maintenance



■ Maintain the Plan:

- Who will be responsible?
 - ❖ Individual, Agency, or Group
- Who will support?
- Who will manage?
- What outputs will be maintained?
- How will changes be introduced and by whom?



Architecture Maintenance



- Maintain the Plan:
 - How often will changes be performed?
 - Who will evaluate changes for inclusion into the baseline?
 - What group will review the change recommendations and make decision?
 - Who will actually modify the architecture baseline?
 - How and who will be notified?



Architecture Maintenance



- Maintain the Plan:
 - Need TurboArchitecture Tool
 - Periodic (quarterly, once or twice a year)



Web Site Reminder

Web Site URL

www.iteris.com/inlandempire-its

ITERIS



Next Meeting/Calendar Review

Project Schedule

ID	Task Name	Start	Finish	December	January	February	March	April	May	June
				Dec	Jan	Feb	Mar	Apr	May	Jun
1	Project Management	Thu 12/12/02	Mon 06/30/03	[Gantt bar: Dec 12/12/02 to Jun 06/30/03]						
2	Project Management Plan	Thu 12/12/02	Wed 01/22/03	[Gantt bar: Dec 12/12/02 to Jan 01/22/03]						
3	Monthly Status Meetings (1/22, 2/18, 3/18, 4/15, 5/22, 6/17)	Thu 12/12/02	Mon 06/30/03	[Gantt bar: Dec 12/12/02 to Jun 06/30/03]						
4	Develop Steering Committee and Identify Stakeholders	Mon 01/06/03	Mon 02/10/03	[Gantt bar: Jan 01/06/03 to Feb 02/10/03]						
5	Informational Flyer	Mon 01/06/03	Fri 01/24/03	[Gantt bar: Jan 01/06/03 to Jan 01/24/03]						
6	Project Web Site	Mon 01/06/03	Mon 02/10/03	[Gantt bar: Jan 01/06/03 to Feb 02/10/03]						
7	Task Workshop #1	Wed 02/05/03	Wed 02/05/03	[Gantt bar: Feb 02/05/03 to Feb 02/05/03]						
8	Stakeholder List	Mon 01/06/03	Mon 02/10/03	[Gantt bar: Jan 01/06/03 to Feb 02/10/03]						
9	Define Region and Update ITS Inventory	Mon 01/13/03	Fri 03/14/03	[Gantt bar: Jan 01/13/03 to Mar 03/14/03]						
10	Task Workshop #1	Wed 02/05/03	Wed 02/05/03	[Gantt bar: Feb 02/05/03 to Feb 02/05/03]						
11	Draft ITS Inventory Report	Mon 01/13/03	Tue 02/18/03	[Gantt bar: Jan 01/13/03 to Feb 02/18/03]						
12	Stakeholder Review	Tue 02/18/03	Fri 02/28/03	[Gantt bar: Feb 02/18/03 to Feb 28/03]						
13	Comment Disposition	Mon 03/03/03	Fri 03/14/03	[Gantt bar: Mar 03/03/03 to Mar 14/03]						
14	Determine Needs, Services, and Operational Concepts	Mon 01/27/03	Fri 05/09/03	[Gantt bar: Jan 01/27/03 to May 09/03]						
15	Draft Needs, Services, and Operational Concepts Report	Mon 01/27/03	Fri 03/21/03	[Gantt bar: Jan 01/27/03 to Mar 21/03]						
16	Task Workshop #2	Tue 03/04/03	Tue 03/04/03	[Gantt bar: Mar 03/04/03 to Mar 03/04/03]						
17	Stakeholder Review	Fri 03/21/03	Wed 04/02/03	[Gantt bar: Mar 21/03 to Apr 02/03]						
18	Comment Disposition	Fri 05/09/03	Fri 05/09/03	[Gantt bar: May 09/03 to May 09/03]						
19	Analyze Functional Requirements and Define Interfaces	Tue 03/18/03	Fri 05/23/03	[Gantt bar: Mar 18/03 to May 23/03]						
20	Draft Functional Requirements and Interface Report	Tue 03/18/03	Mon 05/05/03	[Gantt bar: Mar 18/03 to May 05/03]						
21	Task Workshop #3	Tue 04/08/03	Tue 04/08/03	[Gantt bar: Apr 08/03 to Apr 08/03]						
22	Stakeholder Review	Tue 05/06/03	Fri 05/16/03	[Gantt bar: May 06/03 to May 16/03]						
23	Comment Disposition	Mon 05/19/03	Fri 05/23/03	[Gantt bar: May 19/03 to May 23/03]						
24	Develop Project Sequencing	Mon 04/21/03	Wed 06/04/03	[Gantt bar: Apr 21/03 to Jun 04/03]						
25	Task Workshop #4	Wed 05/07/03	Wed 05/07/03	[Gantt bar: May 07/03 to May 07/03]						
26	Draft Project Sequencing Report	Mon 04/21/03	Fri 05/23/03	[Gantt bar: Apr 21/03 to May 23/03]						
27	Stakeholder Review	Mon 05/26/03	Fri 05/30/03	[Gantt bar: May 26/03 to May 30/03]						
28	Comment Disposition	Mon 06/02/03	Wed 06/04/03	[Gantt bar: Jun 02/03 to Jun 04/03]						
29	Develop List of Agency Agreements	Mon 05/05/03	Fri 05/30/03	[Gantt bar: May 05/03 to May 30/03]						
30	Draft List of Agency Agreements	Mon 05/05/03	Fri 05/16/03	[Gantt bar: May 05/03 to May 16/03]						
31	Stakeholder Review	Mon 05/19/03	Fri 05/23/03	[Gantt bar: May 19/03 to May 23/03]						
32	Comment Disposition	Tue 05/27/03	Fri 05/30/03	[Gantt bar: May 27/03 to May 30/03]						
33	Develop Maintenance Plan	Mon 04/21/03	Fri 05/30/03	[Gantt bar: Apr 21/03 to May 30/03]						
34	Draft Maintenance Plan	Mon 04/21/03	Fri 05/16/03	[Gantt bar: Apr 21/03 to May 16/03]						
35	Stakeholder Review	Mon 05/19/03	Fri 05/23/03	[Gantt bar: May 19/03 to May 23/03]						
36	Comment Disposition	Mon 05/26/03	Fri 05/30/03	[Gantt bar: May 26/03 to May 30/03]						
37	Produce Final Report	Mon 05/12/03	Fri 06/27/03	[Gantt bar: May 12/03 to Jun 27/03]						
38	Draft Final Project Report	Mon 05/12/03	Fri 06/06/03	[Gantt bar: May 12/03 to Jun 06/03]						
39	Task Workshop #5	Tue 06/10/03	Tue 06/10/03	[Gantt bar: Jun 10/03 to Jun 10/03]						
40	Stakeholder Review	Wed 06/11/03	Fri 06/20/03	[Gantt bar: Jun 11/03 to Jun 20/03]						
41	Comment Disposition	Mon 06/23/03	Thu 06/26/03	[Gantt bar: Jun 23/03 to Jun 26/03]						
42	Final Project Report	Fri 06/27/03	Fri 06/27/03	[Gantt bar: Jun 27/03 to Jun 27/03]						

Upcoming Deliverables

- Draft Functional Requirements and Interfaces Report
- Draft Project Sequencing Report
- Draft List of Agency Agreements
- Draft Architecture Maintenance Report
- Comment Disposition(s)



Workshop Calendar

Workshop #1: Stakeholders/Inventory	February 5
Workshop #2: Needs/Services	March 4
Workshop #3: Interfaces	April 8
Workshop #4: Project Sequencing	May 6
Workshop #5: Project Results	June 10

Workshop #4

Inland Empire Regional ITS Architecture Project

May 7, 2003

