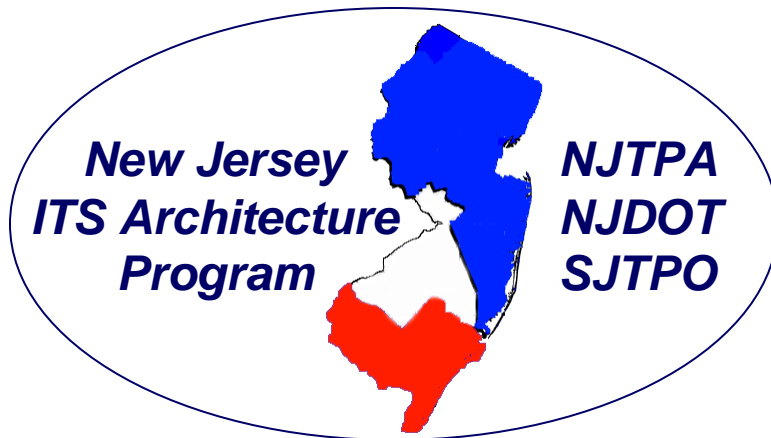


New Jersey ITS Architectures and Deployment Plans

Module 3 - U.S.DOT ITS Rule/Policy Overview



April 14 – Newark (NJTPA)
April 15 – Vineland (SJTPO)
April 23 – Trenton (NJDOT)

Module Topics

- FHWA Rule/FTA Policy origins
- FHWA Rule/FTA Policy requirements

ITS Legislation

- Section 5206(e) of Transportation Equity Act for the 21 Century (TEA-21)
 - “All ITS projects funded through the Highway Trust Fund be in conformance with:
 - National ITS Architecture and
 - Applicable standards”

June 9, 1998

FHWA Rule/FTA Policy

- Issued Jan. 8, 2001
- Regional ITS architectures shall be developed for those regions where ITS has been or will be deployed.
- All ITS projects shall conform to the Regional Architecture.
- ITS planning and programming shall be consistent with the transportation planning process.

What is an ITS Project?

- “Any project that ... funds the acquisition of technologies ... that provides ... one or more ITS User Services as defined in National ITS Architecture”

Rule/Policy Requirements for Regional ITS Architecture



1. Description of the region
2. Identification of participating agencies and stakeholders
3. An operational concept that identifies roles & responsibilities of stakeholders

Rule/Policy Requirements for a Regional ITS Architecture



4. (List of) Any agreements required for operations
5. System functional requirements (high level)
6. Interface requirements and information exchanges with systems

Rule/Policy Requirements for a Regional ITS Architecture



7. Identification of ITS standards supporting regional and national interoperability
8. Sequence of projects required for implementation
9. Procedures and responsibilities for maintaining the regional architecture

Regional ITS Architecture Products

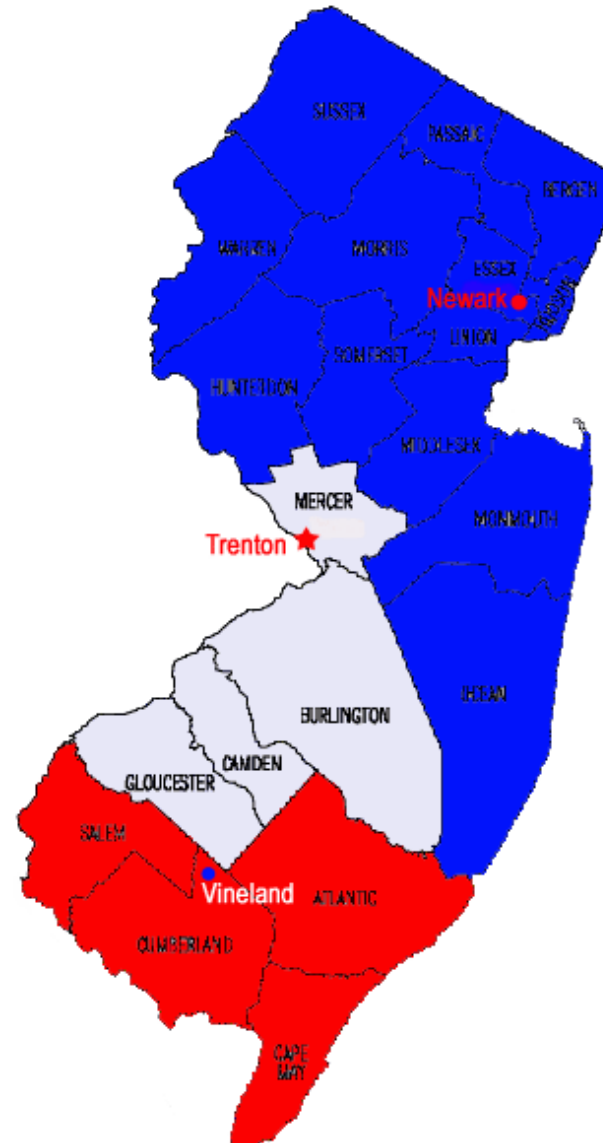


1. Description of the region
2. Identification of participating agencies and stakeholders
3. An operational concept that identifies roles & responsibilities of stakeholders

Geographic Areas for Architectures

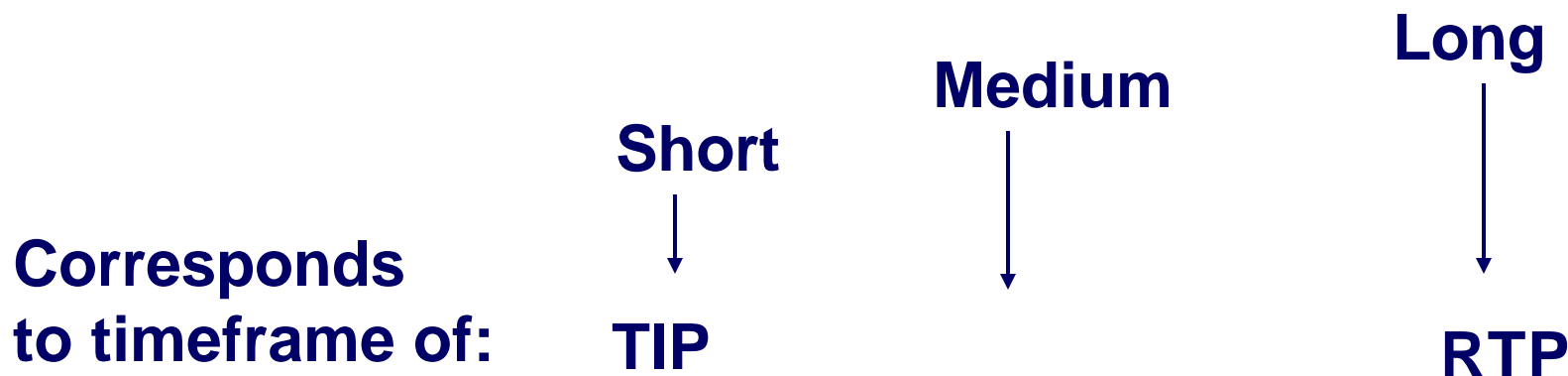


- North Jersey
- South Jersey
- Statewide



Time Frame for Architectures

- Impacts what will be included in Architecture
- Things to consider:
 - Funding timetable
 - Regional planning process timetable
 - Stakeholder processes



Regional ITS Architecture Products



1. Description of the region
2. Identification of participating agencies and stakeholders (and the systems that they own and operate)
3. An operational concept that identifies roles & responsibilities of stakeholders

Stakeholders



Organization or person that has an interest in surface transportation systems for whatever reason

Stakeholder Involvement

- Travel and Traffic Management
- Maintenance Management
- Parking Management
- Public Transportation Management
- Inter-regional Electronic Toll/Parking/Fare Payment
- Information Archive Management
- Ports
- CVO & Ports
- Public Safety/ EM /Homeland Security

ITS Inventory of Systems

- A list of ITS elements and the elements that interface with them
 - And an element is:
 - “The name used by stakeholders to describe an ITS system or piece of a system.”

Examples of ITS Elements

- NH Transit Bus Operations Systems
- PANYNJ Traveler Information Systems
- Private Terminal/Port Operator Systems
- TRANSMIT Agencies Field Equipment

Regional ITS Architecture Products



1. Description of the region
2. Identification of participating agencies and stakeholders
3. An operational concept that identifies roles & responsibilities of stakeholders

ITS Operational Concept



Defines how ITS will operate in the region

Contains:

- Scenarios of interjurisdictional transportation services
- Roles and responsibilities of organizations

Transportation Services

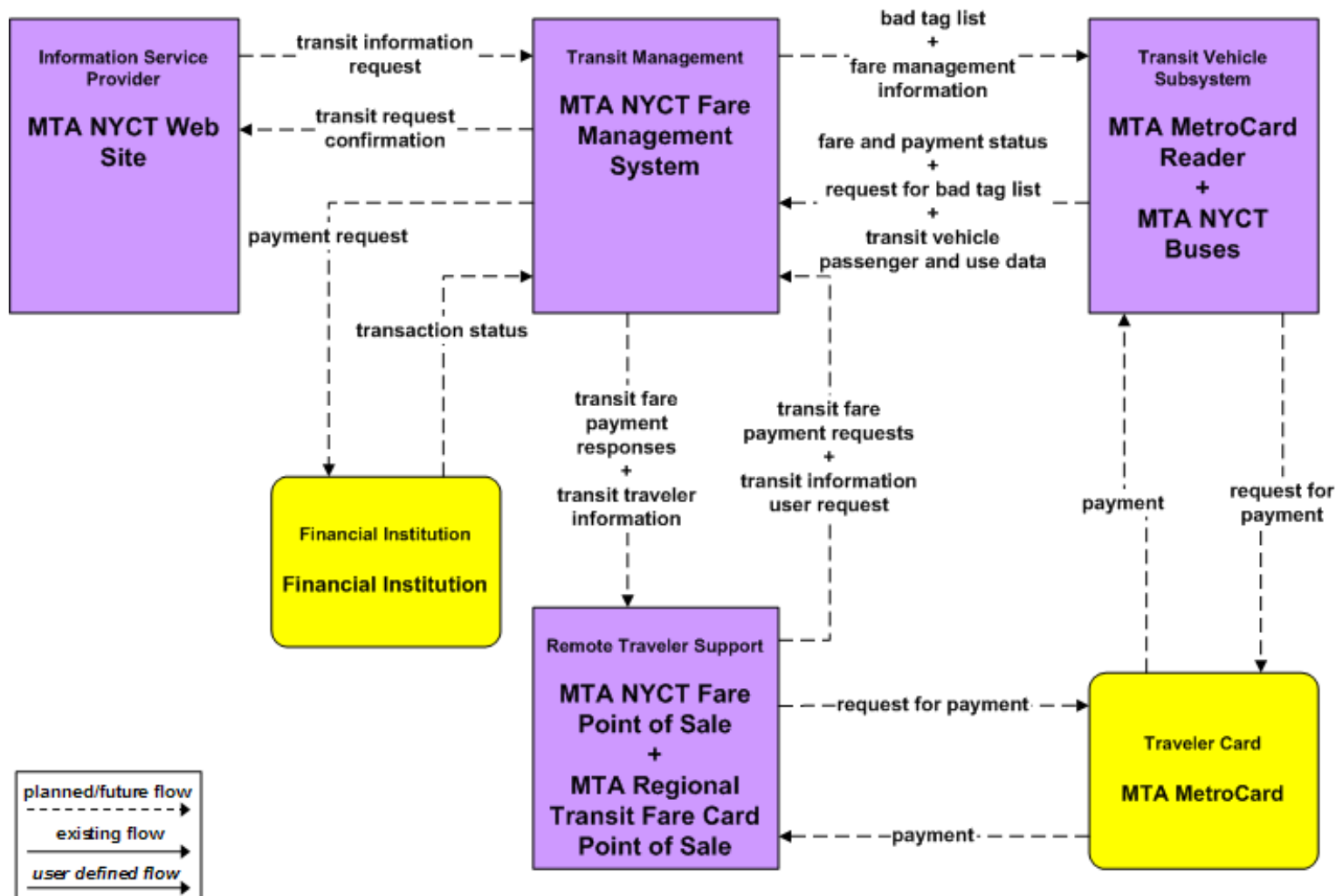
- The systems and capabilities you put in place to meet transportation needs

**Providing Transportation Services is
what you are doing**

Example Transportation Service



APTS4 - Transit Passenger and Fare Payment MTA NYC Transit



Example

ITS Operational Concept



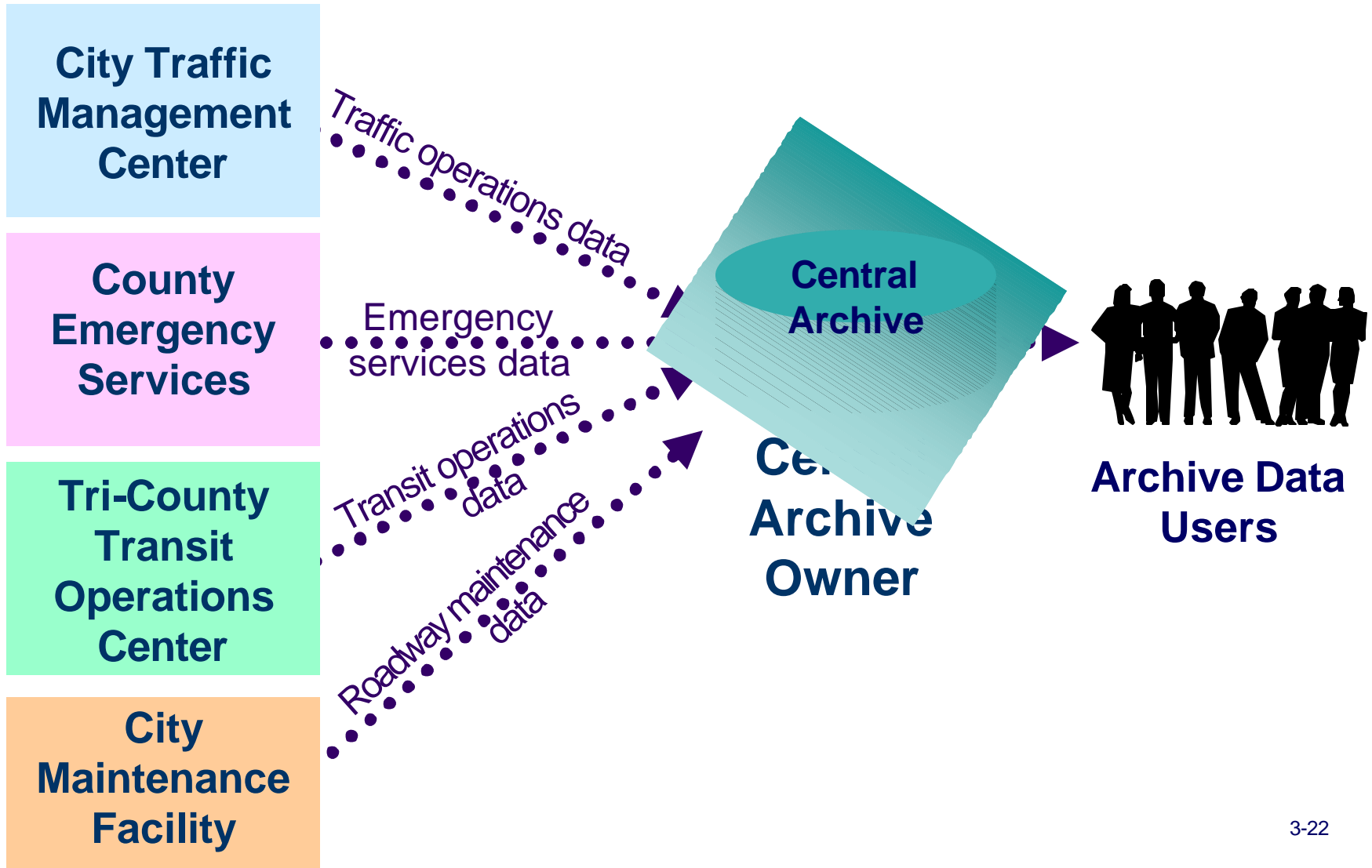
Need: Transportation data to support research, planning, and reporting

Service: ITS Data Archiving

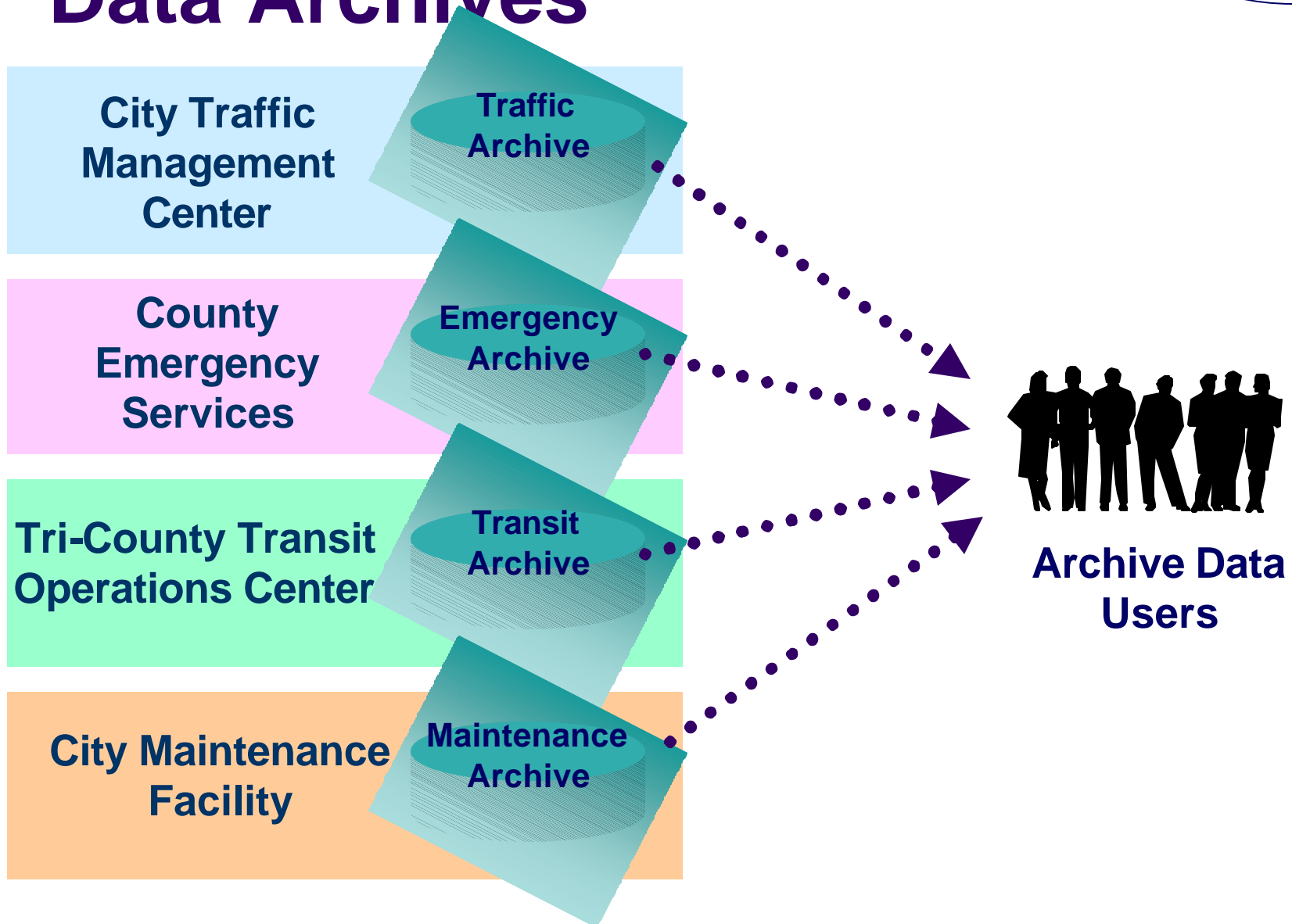
How can the region provide this service?

Let's look at two approaches...

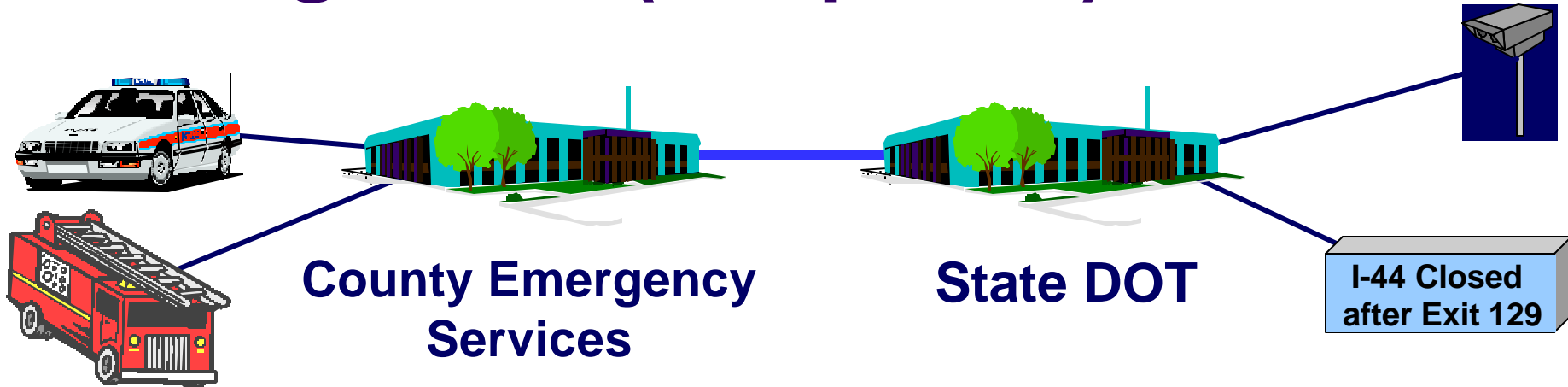
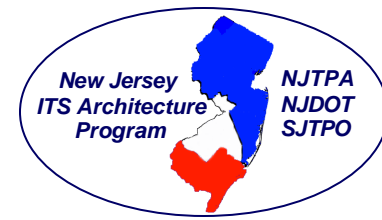
Approach #1: Centralized Data Archive



Approach #2: Distributed Data Archives



Example: Incident Management (Simplified)



- Provide incident information to State DOT
- Provide dispatch instructions to vehicles

- Monitor roadways and provide incident information to Emergency Services
- Share CCTV control with Emergency Services

Regional ITS Architecture Products



4. (List of) Any agreements required for operations
5. System functional requirements (high level)
6. Interface requirements and information exchanges with systems

Agreements Consider...

- Who will provide what services or information to whom
- Intentions or purpose of the agreement
- Terms of agreement, security issues, budget, scope, boundaries
- Perhaps consider:
 - ITS standards decisions
 - Unique information exchange formats

Puget Sound Summary of Interagency Agreement Status (Excerpt)



AREA	EXISTING	PLANNED	POTENTIAL	ISSUES
Regional Traffic Control	King County, Snohomish County, Pierce County, Bremerton, and Lynnwood have agreements for operations and maintenance with multiple jurisdictions WSDOT, Seattle, and Bellevue have agreements for data and video sharing.	WSDOT is planning additional links to multiple jurisdictions for data and video sharing.	Regional Traffic Control Ops Concept identifies potential future links, which will require agreements.	Agreements on shared control will need to be developed for relevant jurisdiction-to-jurisdiction operations. An agreement pertaining to the specific NTCIP Center-to-Center Protocol to deploy will be needed.

Regional ITS Architecture Products



4. (List of) Any agreements required for operations
5. **System functional requirements (high level)**
6. Interface requirements and information exchanges with systems

System Functional Requirements



- High-level descriptions of what your ITS element will do in the region
 - NOT detailed design requirements

Example:

System Functional Requirements



Functional Requirements for the NJ Transit Bus Operations Systems

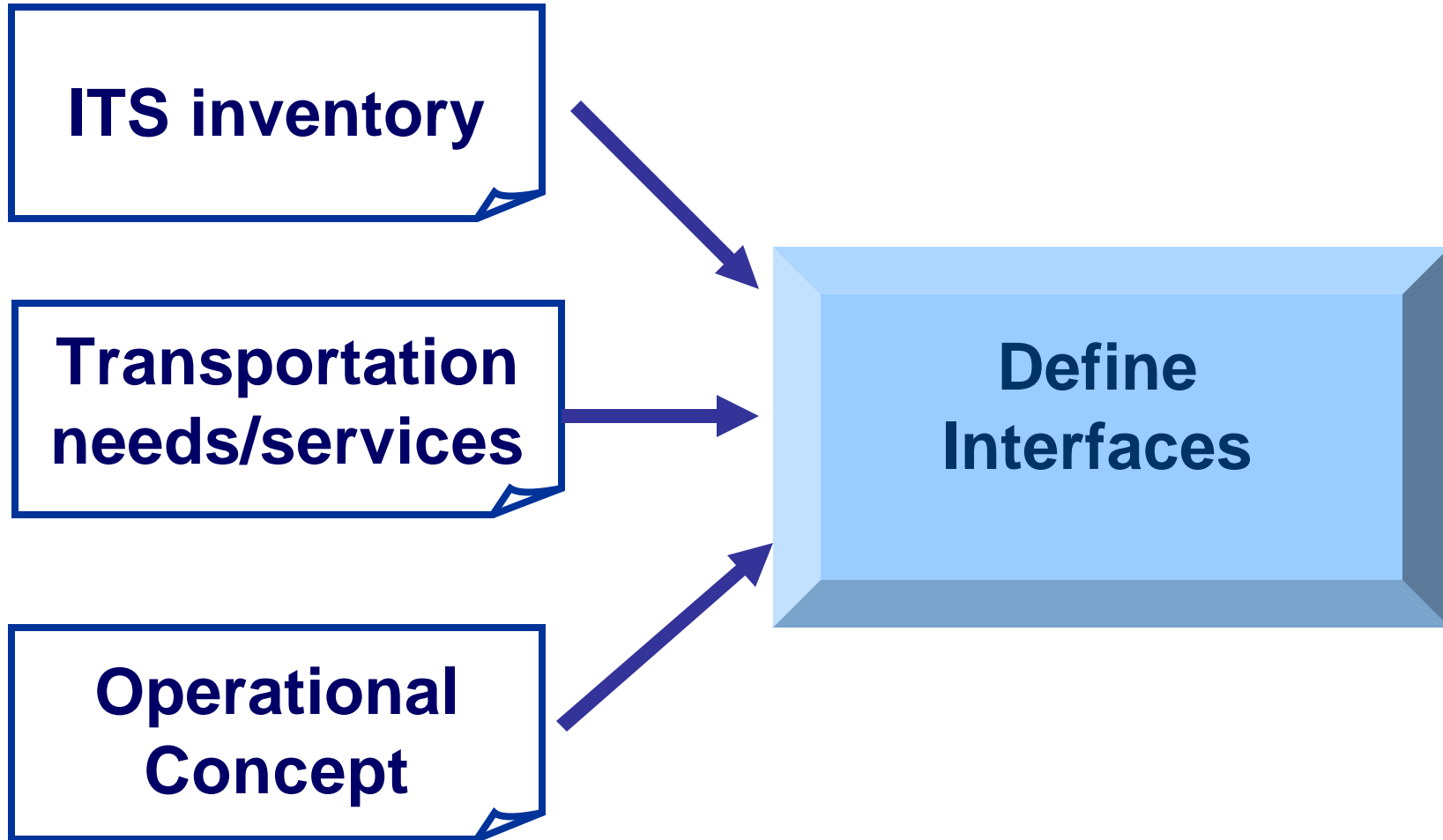
- The center shall monitor the locations of all vehicles within its network.
- The center shall determine adherence of transit vehicles to their assigned schedule.
- The center shall generate transit routes and schedules based on such factors as parameters input by the system operator, road network conditions, operational data on current routes and schedules, and digitized map data.
- ...

Regional ITS Architecture Products



4. (List of) Any agreements required for operations
5. System functional requirements (high level)
6. Interface requirements and information exchanges with systems

How do we know which interfaces to include?



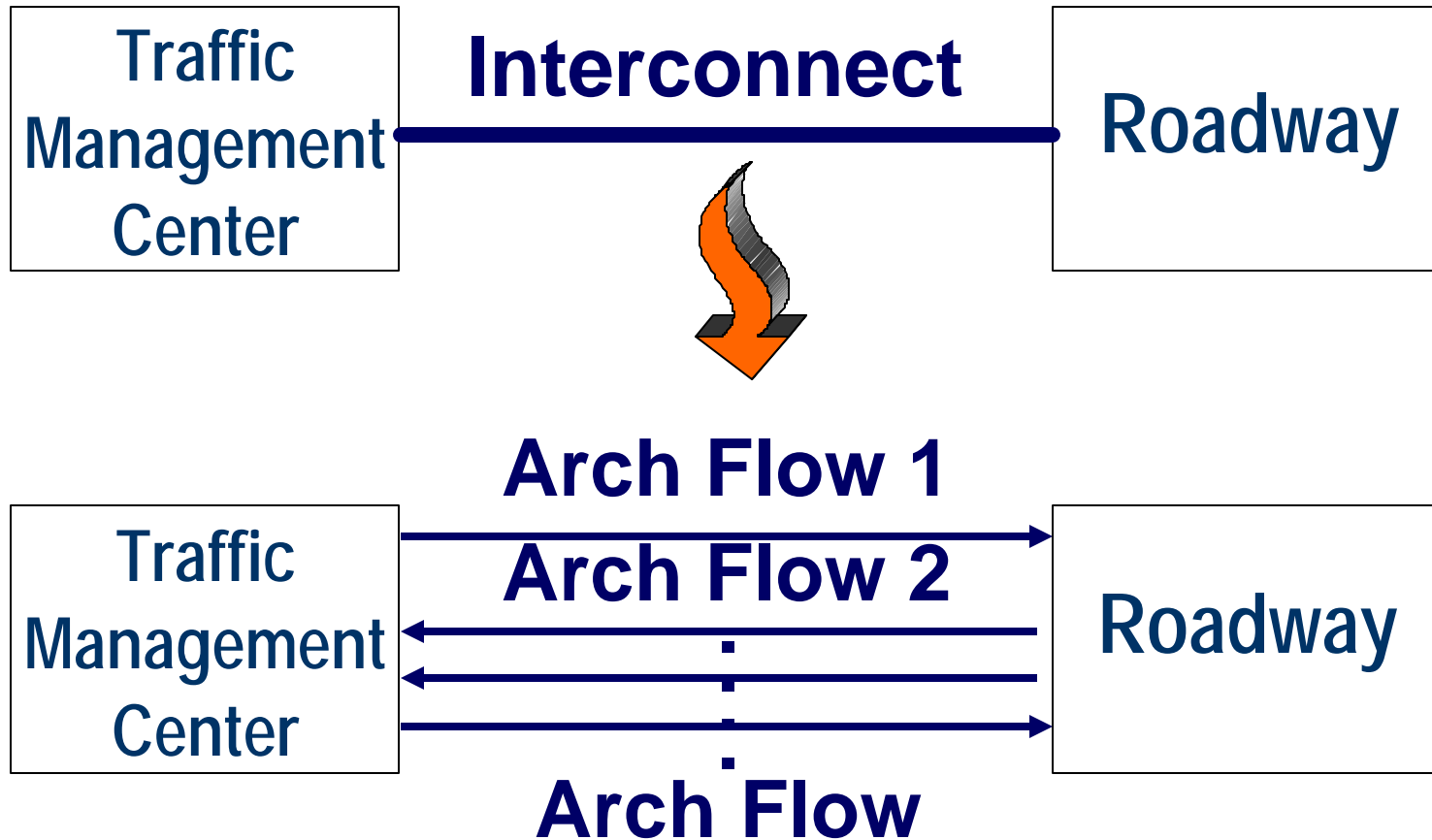
Interfaces: Interconnects



- Identifies which ITS elements exchange information

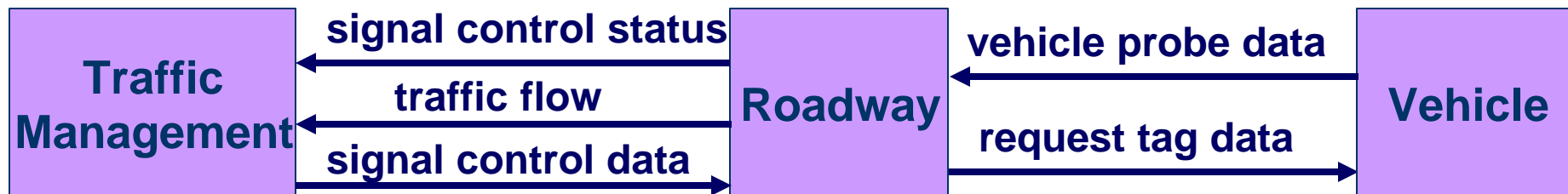


Interfaces: Architecture Flows

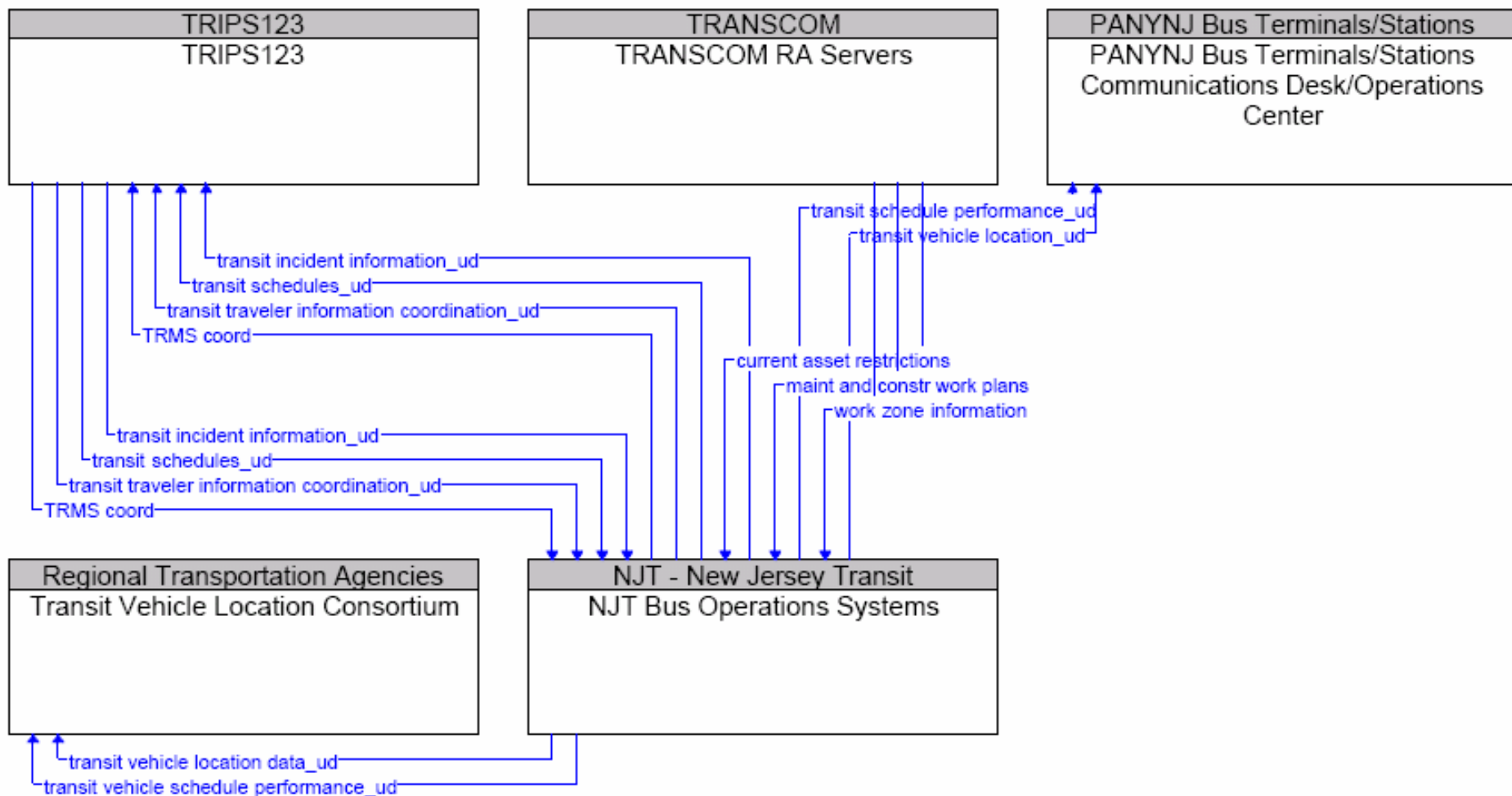


Architecture Flows

- Identifies what information is exchanged between ITS elements



Example: Architecture Flow Output

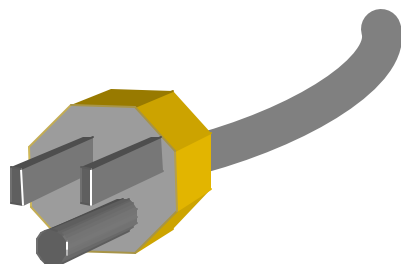
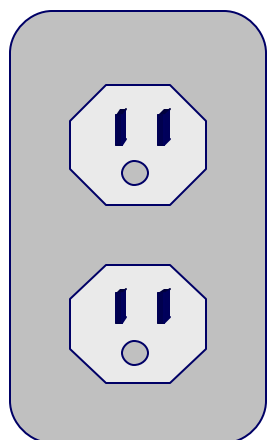


Regional ITS Architecture Products



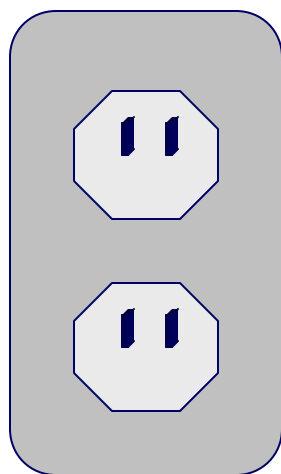
7. Identification of ITS standards supporting regional and national interoperability
8. Sequence of projects required for implementation
9. Procedures and responsibilities for maintaining the regional architecture

What is a “Standard”?

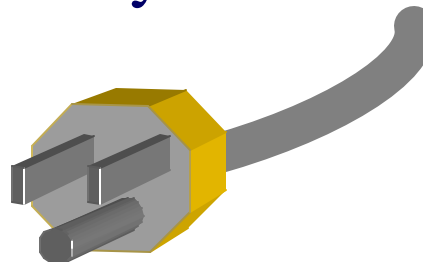
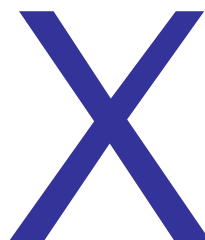


standard, n.

“ something established by
authority, custom, or general
consent as a model ”

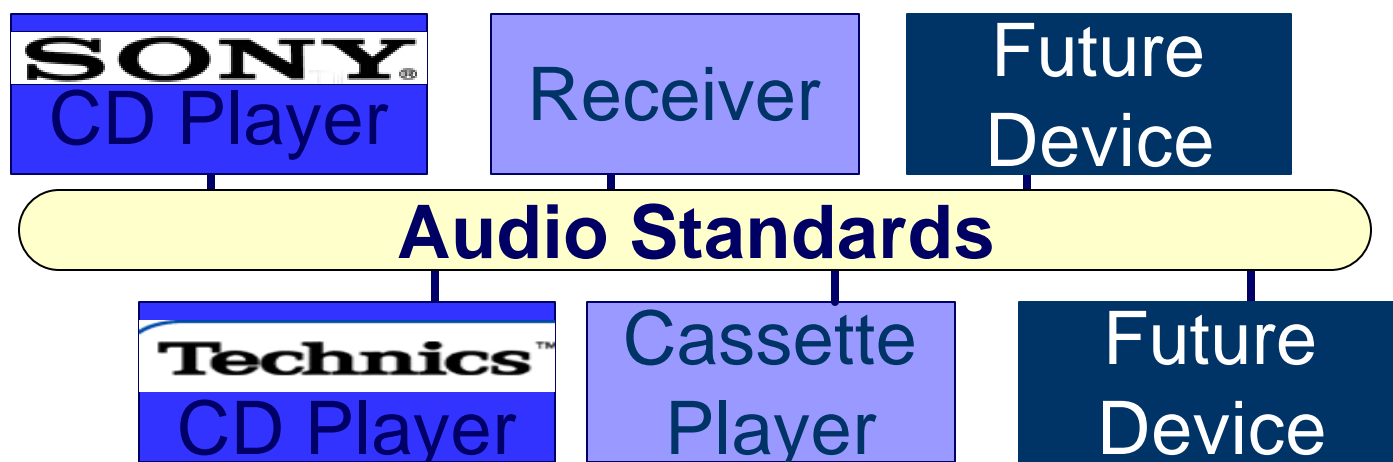


Why are they needed?



Goals of ITS Standards

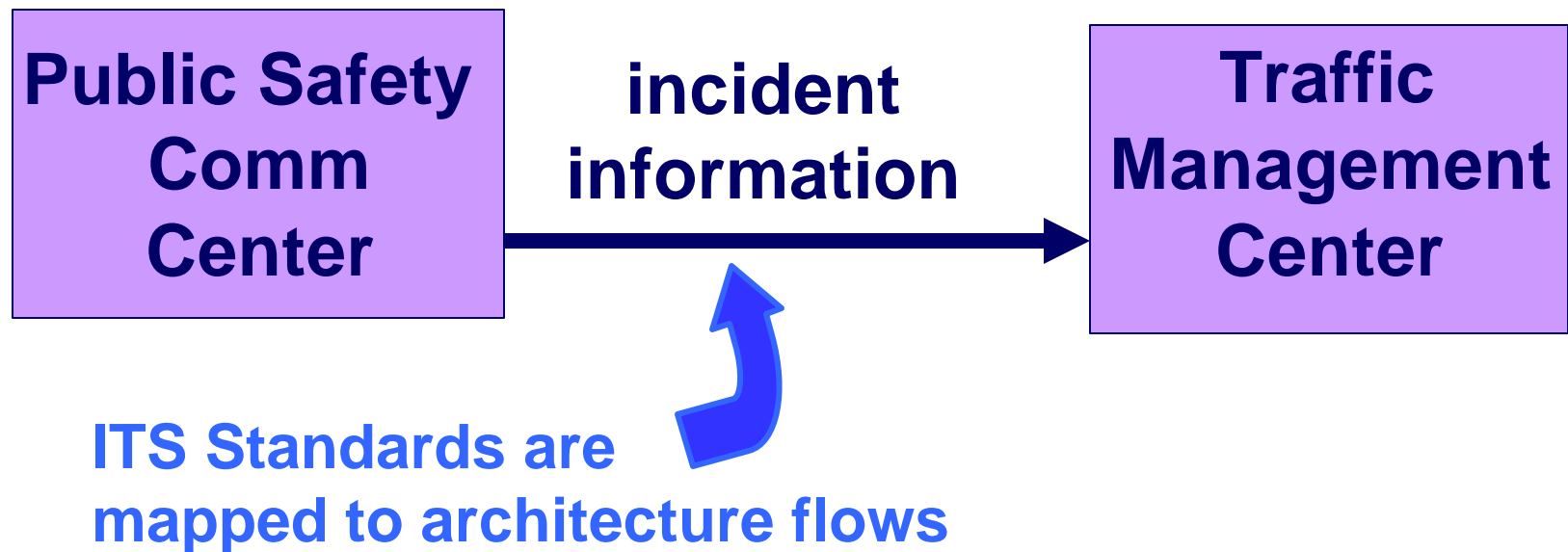
- Interchangeability - multiple brands of a device on the same communications channel
- Interoperability - different types of devices on the same communications channel
- Expandability - add future devices



ITS Architecture and ITS Standards



- ITS Standards define interfaces between systems



How Many? What Are They?

- Over 80 ITS Standards
- Cover Transit, Traffic, CVO, Toll, Traveler Information, plus.....
- Includes families of ITS Standards
 - NTCIP (National Transportation Communications for ITS Protocol)
 - TCIP (Transit Communication Interface Profiles)
 - TMDD (Traffic Management Data Dictionary) & MS/ETMCC (External TMC Message Set)

Example: Architecture Flow Standards Report



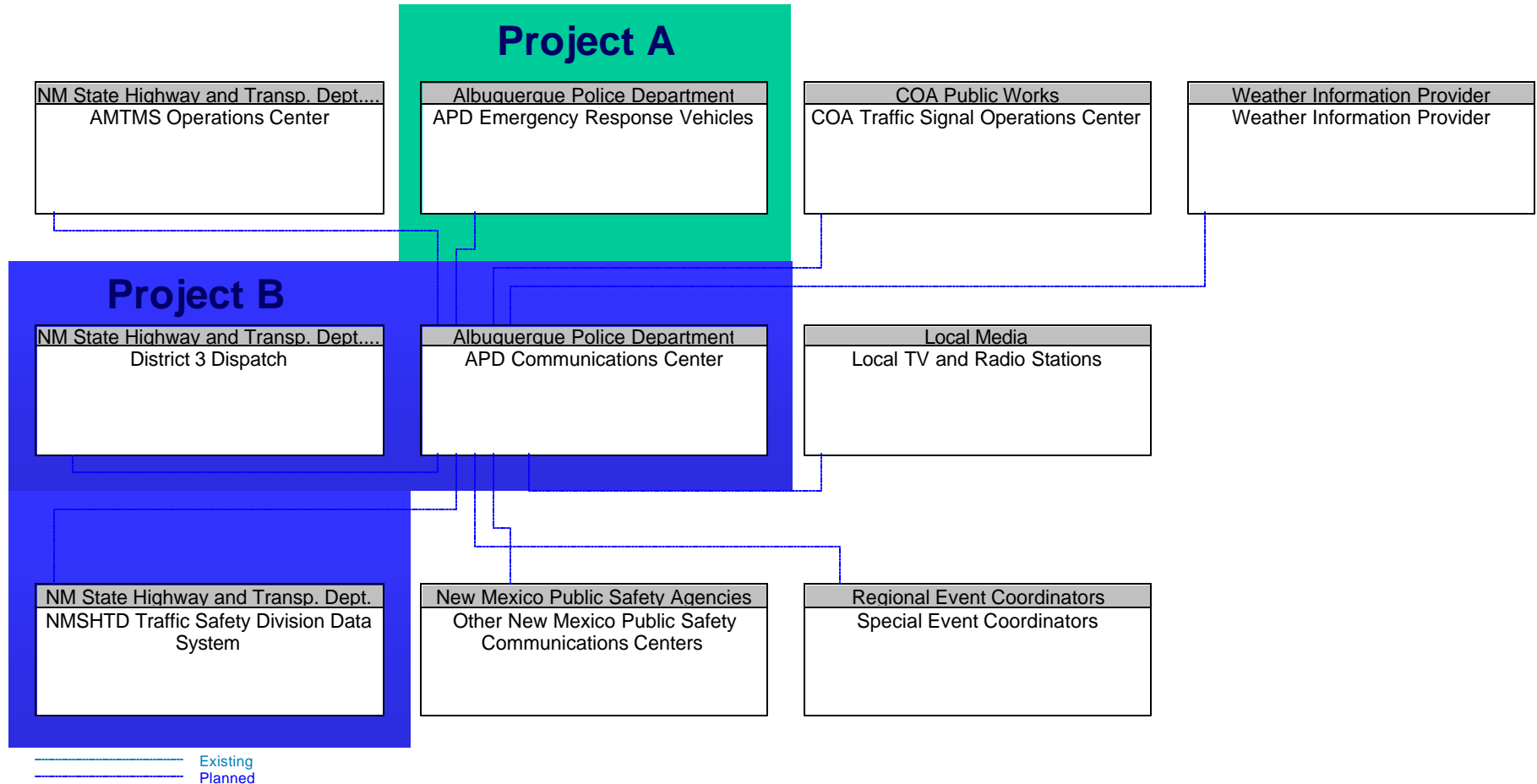
Source Element	Destination Element	Architecture Flow Name	SDO and Standard Title	Info (Optional)
City A TMC	City A EOC	incident information	IEEE 1512-2000 - ... IEEE 1512.1-2003 - ... ITE TM 1.03 - ... ITE TM 2.01 - ... NTCIP 1104 - ... NTCIP 1105 - ... ? ?	
		resource deployment status	IEEE 1512-2000 - ... IEEE 1512.1-2003 - ... ? ?	

Regional ITS Architecture Products



7. Identification of ITS standards supporting regional and national interoperability
8. Sequence of projects required for implementation
9. Procedures and responsibilities for maintaining the regional architecture

Projects from Regional ITS Architecture



Project Sequencing

- Sequencing is a reflection of the order in which ITS projects should be implemented
 - Project Timeframe
 - General: Short, Medium and Long
 - Specific: 1) Project A, 2) Project B, etc
- Project Sequencing decisions are impacted by:
 - Technical Issues
 - Institutional Issues

Central Coast ITS Project Sequencing (Excerpt)



Market Package	Specific Locations/Areas		Time Frame	Possible Responsible Agencies
TRANSIT MANAGEMENT				
Transit Vehicle Tracking	Region:			
		All transit systems	S/M	Transit Agencies
	Santa Barbara County:			
		SBMTD	S/M	SBMTD
		SMAT	S/M	SMAT
	San Luis Obispo County:			
		CCAT	S/M	CCAT
		SLO Transit	S/M	SLO Transit
		PRCATS	L	PRCATS
		SCAT	S/M	SCAT
		Ride-On	S/M	Ride-On

Regional ITS Architecture Products



7. Identification of ITS standards supporting regional and national interoperability
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Maintaining a Regional ITS Architecture



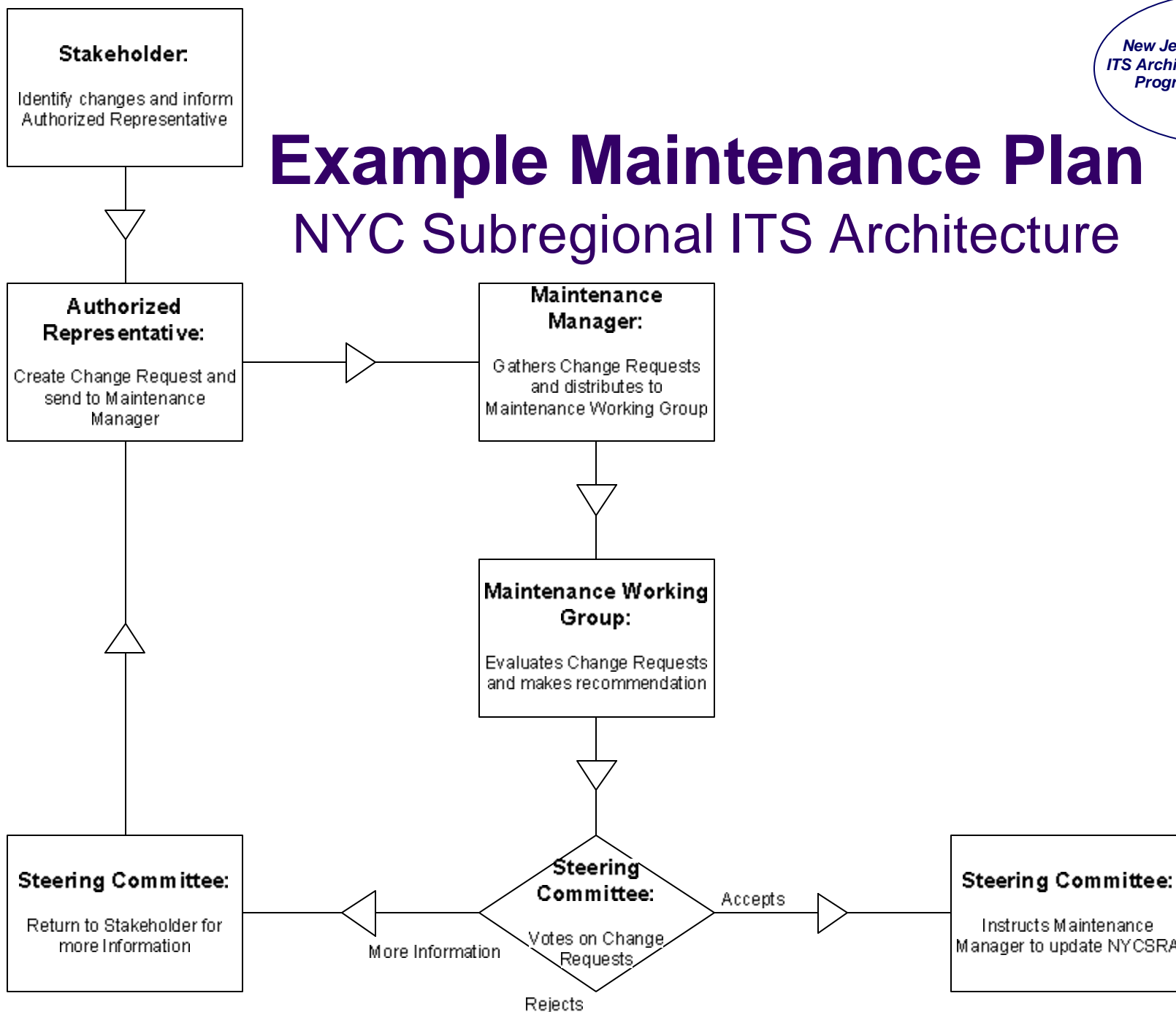
- Keep the Architecture up-to-date as:
 - Plans are revised
 - ITS projects are deployed
 - ITS needs and services evolve
 - Additional stakeholders are identified or engaged

Preparing a Maintenance Plan

- Who will be responsible?
- When will architecture be changed?
- What will be maintained?
 - Architecture baseline
- How will changes be managed?
 - Changes must be identified, evaluated and approved
 - Architecture updated
 - Stakeholders notified of change to baseline

Example Maintenance Plan

NYC Subregional ITS Architecture



Regional Architecture Products



1. Region description
2. Stakeholder identification
3. Operational concept
4. Functional requirements
5. Interfaces / Information flows (System inventory)
6. Agreements
7. Standards identification
8. Project sequencing
9. Maintenance plan