

Regional ITS Architectures

**Border Information Flow
Architecture(BIFA)
Web Conference**

December 9, 2004



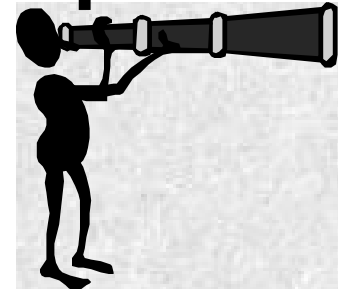
What is a Regional ITS Architecture?



“A regional framework for ensuring institutional agreement and technical integration for the implementation of ITS projects or groups of projects.”

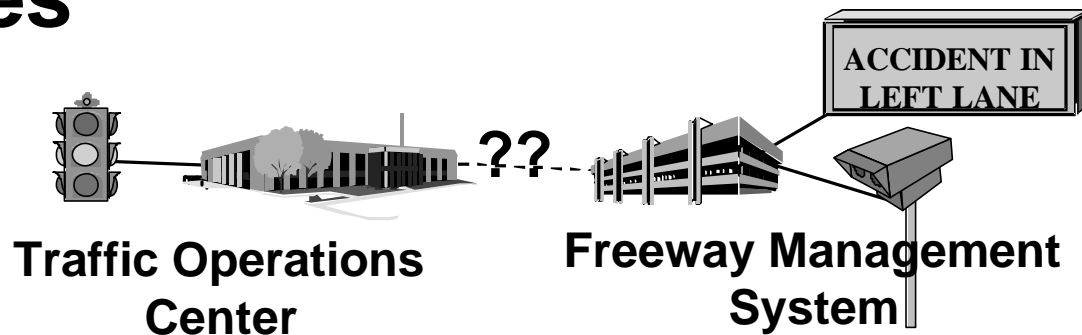
Why Develop a Regional ITS Architecture?

- **Identify integration opportunities**
 - Among regional transportation systems
 - Identify information sharing
- **Efficiently structure implementations**
 - Prepare for future expansion
 - Leverage funding
 - Deploy projects consistent with plan / regional architecture
 - Identify standard interfaces



Why Develop a Regional ITS Architecture?

- **Encourage stakeholder buy-in**
 - Traditional and non-traditional players
- **Serve as tool for education / stakeholder information exchange**
- **Assist in estimating funding needs**
- **Assist in identifying gaps in existing services**



Why Develop a Regional ITS Architecture?



- **And— In the US-- Architecture and Standards Rule/Policy requires development of a Regional ITS Architecture**
 - **If using Highway Trust Fund money to fund deployment of projects containing ITS elements**

ITS Architecture and Standards Rule/Policy



- **FHWA Rule and FTA Policy intended to foster integration of ITS Systems**
 - **Defines requirements for Regional ITS Architectures**
 - **Must be created by April 8, 2005***
 - **Defines requirements for ITS projects**
 - **Includes mapping to Regional ITS Architecture**
- * For any region currently implementing ITS projects**

What is in a Regional ITS Architecture?*

- **Description of the region**
- **Agencies and stakeholders**
- **An operational concept that identifies roles & responsibilities of stakeholders**
- **Inventory of systems**
- **Needs and Services provided**
- **Information exchanges between systems**

** Based on FHWA guidance for development of Regional ITS Architecture, Oct 2001*

What is in a Regional ITS Architecture? (cont)

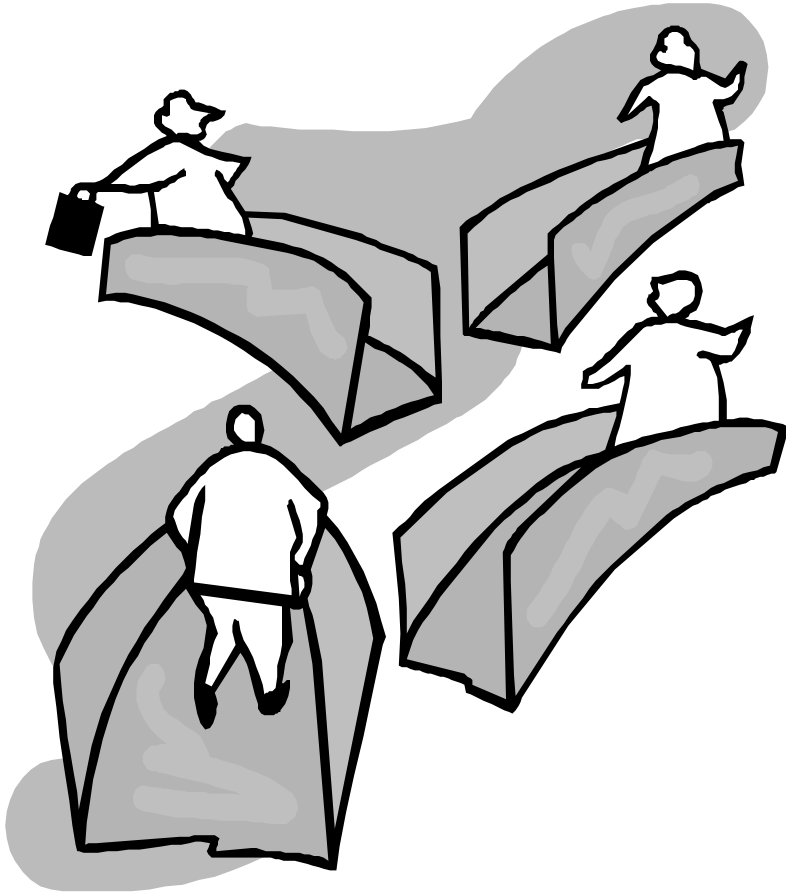
- **System functional requirements (high level)**
- **Identification of relevant ITS standards**
- **(List of) Any agreements required for operations**
- **Sequence of projects required for implementation**

And...there must exist a procedure for maintaining the regional ITS architecture and using it as a guide in the development of ITS projects.

Description of Region

- **Define the geographic area to be covered**
- **Define the time horizon**
- **Define the breadth of services included**

Stakeholders



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

Existing Regional Architectures will be used as Examples

Regional Architecture	Description/ Date Created
British Columbia	Provincial Architecture organized around 18 “initiatives”. 11/2001
Southeast Michigan	Seven counties of Southeast Michigan including Detroit, US/Canadian border and City of Windsor. 3/2002
Vermont Statewide	Statewide architecture including US/Canada border interfaces. 11/2004
Western NY and Southern Ontario	Includes Buffalo, US/Canada border, and nearby Canadian systems. 6/2001 (updated 10/2002)

Examples of Stakeholders

Architecture	Stakeholders
British Columbia	<ul style="list-style-type: none">•British Columbia MOT•Insurance Corporation of British Columbia•Canada Customs and Revenue Agency
Southeast Michigan	<ul style="list-style-type: none">•City of Detroit DOT/Michigan DOT•Centra / Ambassador Bridge Corp•City of Windsor/ Ontario MOT
Vermont Statewide	<ul style="list-style-type: none">•VTrans•Vermont DMV•US Customs and Border Protection
Western NY and Southern Ontario	<ul style="list-style-type: none">•Niagara International Transportation Technology Coalition (NITTEC)•Buffalo & Fort Erie Public Bridge Authority•Canadian Customs and Revenue Agency

Operational Concept

“... identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems included in the regional ITS architecture”

- From the “Intelligent Transportation System Architecture and Standards; Final Rule/Policy”



Example of Operational Concept- Vermont

Service	Stakeholder	Roles and Responsibilities
Commercial Vehicle Operations	Vermont DMV	<ul style="list-style-type: none"> • Perform oversize/ overweight enforcement ▪ Perform CV safety inspections. ▪ Perform commercial vehicle electronic clearance at domestic intermodal ports of entry ▪ Issue commercial vehicle credentials • Issue commercial vehicle permits • Input oversize/overweight data into CARS
	US BCP	<ul style="list-style-type: none"> ▪ Perform commercial vehicle electronic clearance at international intermodal ports of entry

ITS Inventory

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

Architecture	Elements
British Columbia	<ul style="list-style-type: none">•Regional Traffic Control Centre•BC CVO Virtual Regional Service Centre (BC CVO CVIEW)•Canadian Border Crossing Station
Southeast Michigan	<ul style="list-style-type: none">•MITSC (Michigan ITS Center)•Ambassador Bridge Operations Center•City of Windsor TOC
Vermont Statewide	<ul style="list-style-type: none">•VTrans State TOC•VT CVIEW System•International Intermodal Ports of Entry
Western NY and Southern Ontario	<ul style="list-style-type: none">•NITTEC Traffic Operations Center•Peace Bridge Web Page•Canadian Customs and Revenue System

Element Example

- **Each element has the following information:
(using VT CVIEW System as an example)**

Information	Example
Name	VT CVIEW System
Stakeholder	Vermont DMV
Description	Commercial Vehicle Information Exchange Window. Collects snapshots for interstate and intrastate carriers, vehicles, and drivers. Interfaces with SAFER for interstate snapshot exchange. Also distributed snapshots to other states.
Status	Planned
Map to Nat'l Architectures	Commercial Vehicle Administration Subsystem

Needs

- **Needs are a description of the region's transportation problems**
 - **May be general (e.g. reduce congestion)**
 - **May be specific (e.g. provide up to date weather information to travelers)**



Transportation *Services*

- **The systems and capabilities you put in place to meet transportation needs**
- **These can be described by:
Market Packages**

Remember- Market Packages Cover

- **Traffic Management**
- **Traveler Information**
- **Transit Management**
- **Emergency Management**
- **Commercial Vehicle Operations**
- **Maintenance and Construction**
- **Archived Data Management**
- **Advanced Vehicle Safety**

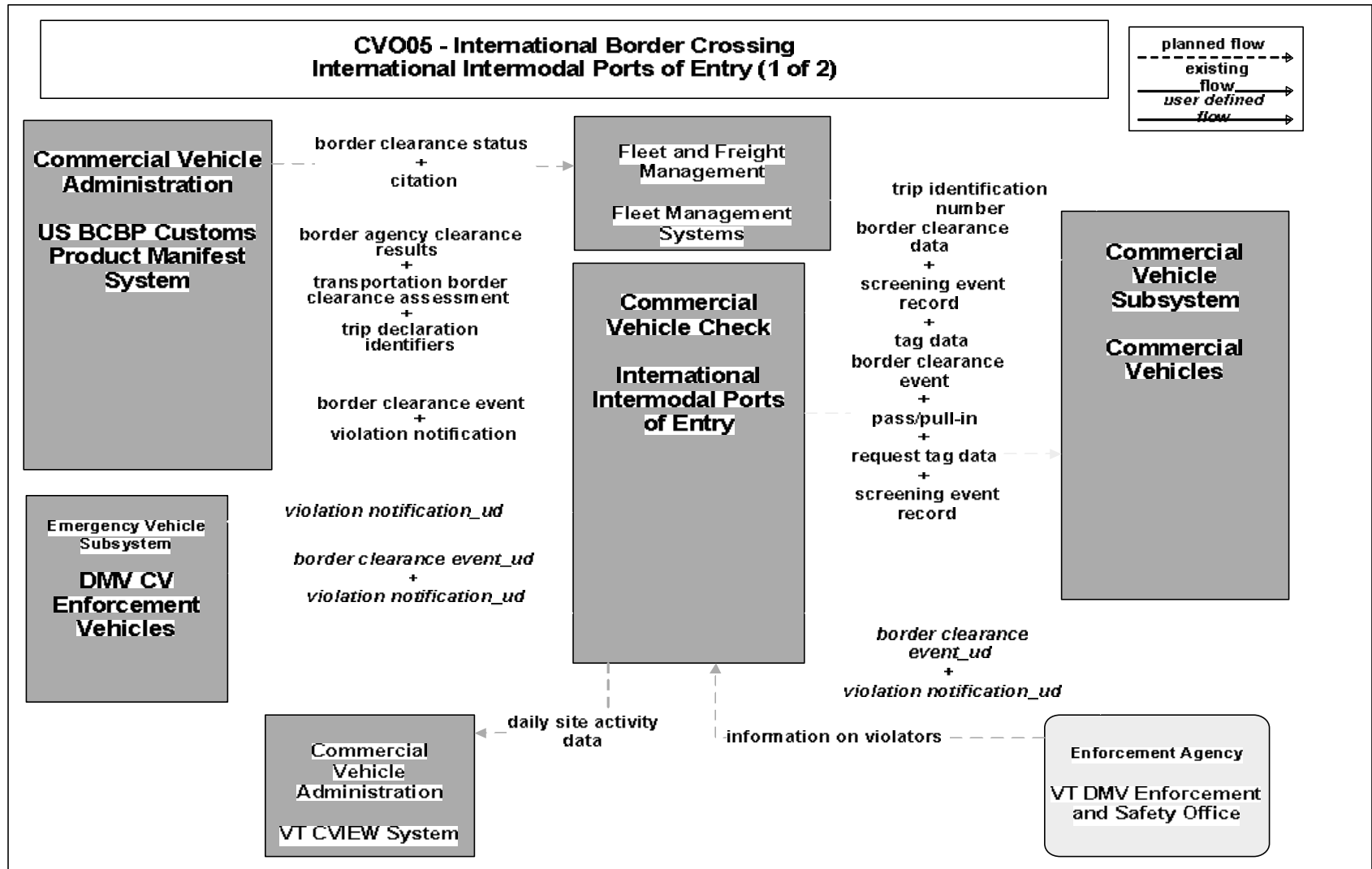
Example: Market Packages in Vermont Statewide ITS Arch

- **Vermont Statewide ITS Architecture includes 45 of 85 Market Packages from the US National ITS Architecture**
 - **Traffic Management (10)**
 - **Traveler Information (2)**
 - **Transit Management (8)**
 - **Emergency Management (6)**
 - **Commercial Vehicle Operations (7)**
 - **Maintenance and Construction (10)**
 - **Archived Data Management (2)**
 - **Advanced Vehicle Safety (0)**

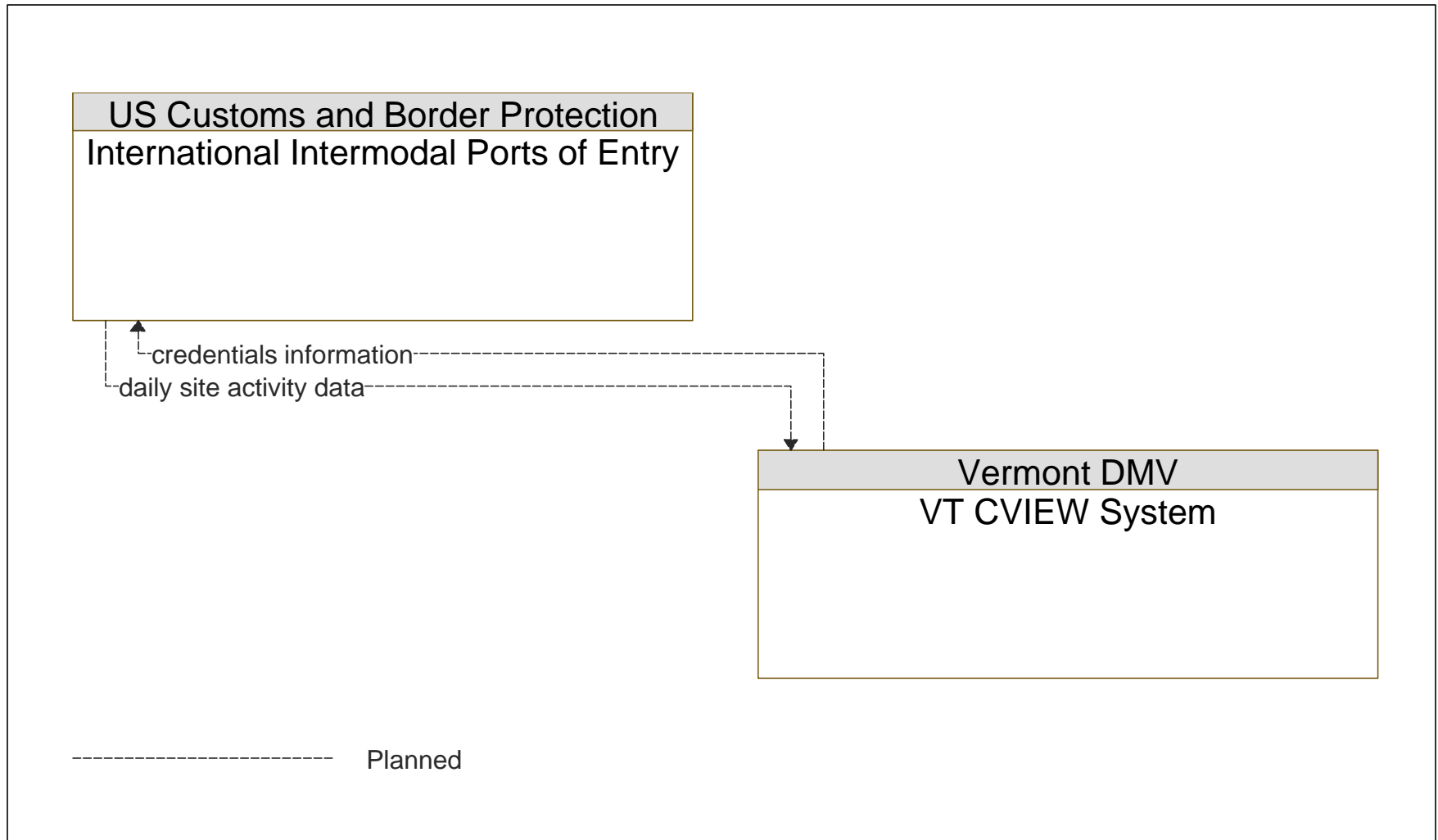
Information exchanges between systems

- **The “details” of the architecture**
 - **Develop by**
 - **Customizing Market Packages**
- Or**
- **Customizing interfaces from an architecture database (e.g. Turbo Architecture)**

Examples of Information Exchanges- Customizing Market Packages



Example of Information Exchanges- Customizing Interfaces



System Functional Requirements

- **High-level descriptions of what the ITS elements will do in the region**
 - **NOT detailed design requirements**
 - **Local region determines level of detail**

Example: State DOT TOC Closed Circuit TV (CCTV)

- **Make CCTV images available to users in the region (State DOT TOC)**
- **System Functional Requirements**
 - **The system *shall* make CCTV camera images available to operational users**
 - **The system *shall* selectively provide access to camera control (pan, tilt & zoom) to operational users**



Other Aspects of Regional Architecture

- **ITS standards**
 - Standardized methods of exchanging information across interfaces defined in architecture
- **List of needed agreements**
 - Agreements needed between agencies to implement interfaces of architecture
- **Sequence of projects**
 - Regional projects and their dependencies/ timeframe for implementation

For more information on

- **National Architectures**

- **US:** *<http://itsarch.iteris.com/itsarch/>*

- **Canadian:** *www.its-sti.gc.ca/en/architecture.htm*

- **Example Regional ITS Architectures**

- **British Columbia**

- www.itsbc.ca/main.html* (Select Strategic Plan)

- **Southeast Michigan**

- www.semcog.org/TranPlan/ITS/*

- **Western New York and Vermont Statewide**

- www.consystem.com* (Select New York State or Vermont Statewide on left side)

Questions?