

Transit ITS Strategic Planning in Virginia

ITSVA Annual Meeting

April 29, 2009

**Virginia Department of Rail & Public
Transportation**

Project Need

- ❑ **Current** - Ad-hoc ITS deployment
 - Independent systems
 - Varying technology standards
 - Difficulties in data sharing
 - Limited guidance on project selection
 - Barriers to deployment

- ❑ **Future** – Results from Transit ITS Strategic Plan
 - Improved program coordination
 - Greater return from ongoing and new deployments
 - Cost savings
 - Phased technology roll-outs that allow for optimization of investments and returns
 - Greater consistency in the levels and types of service provided across operators

DRPT Mission: *Improve the mobility of people and goods while expanding transportation choices in the Commonwealth*

Project Overview

- ❑ **Establish a coordinated process for transit ITS planning and deployment**
- ❑ **AECOM / IBI Group team leading effort to develop transit ITS strategic plan:**
 - **Statewide Transit Systems Inventory/Assessment**
 - **Technology Assessment**
 - **Review Statewide ITS Architecture Components**
 - **Evaluation and Deployment Strategy**
 - **Virginia Transit ITS Strategic Plan**

Technology Assessment

Inventory Transit ITS – Market Trends

Central Systems

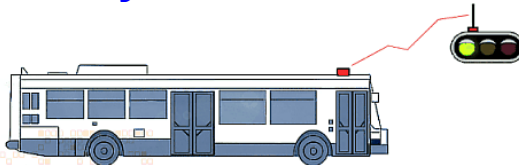
- Communications Systems
- Computer Aided Dispatching (CAD) / Automatic Vehicle Location (AVL)
- Scheduling & Workforce Management Software
- Maintenance Management Systems (MMS)



In-Vehicle Systems

- Mobile Data Terminals
- Automatic Stop Announcements (ASA)
- Automatic Passenger Counters

Transit Signal Priority



Automated Fare Collection

Security Systems

- On-Board Cameras
- In-Station/Stop Cameras
- In-Station/Stop Emergency Alarms
- Vehicle Alarms



Advanced Traveler Information

- Next Bus Arrival Displays/Annunciation at Stations
- Real-time Information Provided Online
- Real-time Information Available through Personal Communications Devices
- Interactive Voice Response (IVR) System
- Transit Trip Planner



Scenarios – Technology Bundles

- Industry typical scenarios for technology deployments by service type and size

		On-Board Equipment					Central System Equipment							Wayside Equipment				
		CAD/AVL	APC	AVA	TSP	AFC	On-Board Cam	IVR	RT Web	Trip Plan	Info Mobile Device	Sched & Run Cut	Maint Mgmt	Driver Mgmt	Yard Mgmt	Info Displ	Sec Cam	Sec Alarm Button
Fixed-Route	300+ Vehicles	●	●	●	●	●	●	●	●	●	●	●	●	●	◐	●	●	◐
	100-300 Vehicles	●	●	●	◐	●	●	◐	◐	◐	◐	●	●	●	◐	●	●	◐
	<100 Vehicles	●	◐	●	○	◐	◐	◐	◐	◐	○	●	◐	◐	◐	◐	○	○
Demand-Response	Large (50+ Vehicles)	●	-	-	-	◐	●	-	-	-	-	●	-	-	-	-	-	-
	Small (<50 Vehicles)	●	-	-	-	◐	◐	-	-	-	-	●	-	-	-	-	-	-
Commuter Bus		●	○	◐	○	●	●	●	●	◐	●	◐	◐	◐	○	●	●	○
Passenger Rail		●	◐	●	-	◐	●	●	●	●	◐	●	◐	◐	○	●	●	◐

 Essential
  Desirable
  Optional

Survey Results

23 agencies responded, categorized by service type:

FIXED-ROUTE	
300+ Vehicles	WMATA
	Hampton Roads Transit
100-300 Vehicles	Fairfax County DOT (Fairfax Connector)
<100 Vehicles	AASC/Four County Transit
	Alexandria Transit Company
	Arlington Transit
	Blacksburg Transit
	Charlottesville Transit Service
	Greater Roanoke Transit Company
	Harrisonburg
	King Street Trolley
	Loudoun County Office of Transportation Services
	Potomac & Rappahannock Transportation Commission
	RADAR-UHSTS, Inc.
	Virginia Regional Transit
	Passenger Rail

DEMAND-RESPONSE	
50+ Vehicles (Large Fleet)	Arlington Transit
	Hampton Roads Transit
	JAUNT, Inc.
<50 Vehicles (Small Fleet)	WMATA
	AASC/Four County Transit
	Bay Transit
	Blacksburg Transit
	Charlottesville Transit Service
	Greater Roanoke Transit Company
	Greene County Transit, Inc.
	Harrisonburg
	Lake Area Bus
	RADAR-UHSTS, Inc.
	Rockbridge Area Transportation System
	Virginia Regional Transit
	Williamsburg Area Transit Authority
	Commuter Bus
	Potomac & Rappahannock Transportation Commission

Survey Results - SmartBus

	Currently Deployed	Not Deployed and Plan to Implement	Not Deployed and No Plan to Implement
AVL/CAD	52%	35%	13%
APC	22%	35%	43%
Black Box	9%	26%	65%
TSP	9%	35%	57%

- ❑ AVL/CAD is the most commonly deployed, with varying capabilities
- ❑ Black Box and TSP are not common deployments
- ❑ ITS technology vendors vary from agency to agency



Survey Results – Electronic Payment

	Currently Deployed	Not Deployed and Plan to Implement	Not Deployed and No Plan to Implement
Registering Fareboxes	52%	13%	35%

- ❑ Common AFC vendors include GFI and Cubic
- ❑ Fare media supported include SmartCard (Metrocard), magnetic stripe, coins, and bills



Survey Results – Security

	Currently Deployed	Not Deployed and Plan to Implement	Not Deployed and No Plan to Implement
Driver Camera	36%	41%	23%
On-Board Camera	39%	35%	26%
In-Station/Stop Camera	18%	32%	45%
In-Station/Stop Emergency Alarm	14%	18%	64%

- ❑ Common on-board camera vendors include Safety Vision, DriveCam, and GE
- ❑ Video feeds are not usually monitored in real-time. Reviewed only when there is an incident.



Survey Results – Traveler Information

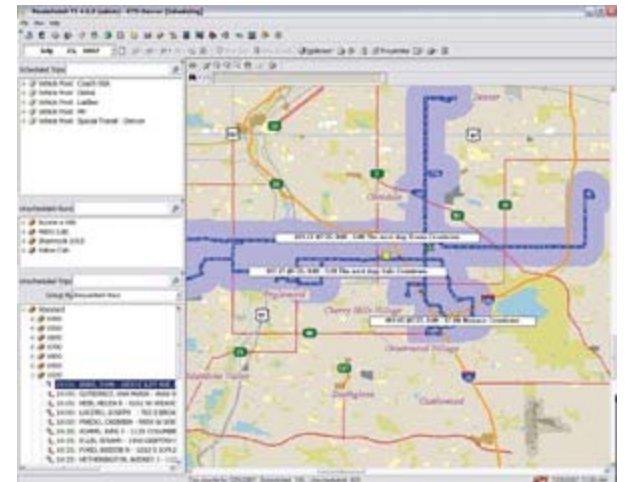
	Currently Deployed	Not Deployed and Plan to Implement	Not Deployed and No Plan to Implement
Automated Stop Announcement/ Message Sign	39%	35%	26%
Electronic Destination Sign	70%	4%	26%
Trip Planner	36%	32%	32%
Next Bus Arrival Display	18%	55%	27%
Real Time Information - On-Line	18%	55%	27%
Real Time Information - Personal Comm Device	14%	55%	32%
IVR Phone System	27%	36%	36%

- ❑ Common Electronic Destination Sign vendors include Luminator and Twin Vision
- ❑ Common Automated Stop Announcement / Sign include Digital Recorders and Twin Vision
- ❑ Multiple agencies are deploying the Google Trip Planner



Survey Results – Operational

- ❑ Within Operational category, technologies surveyed include:
 - Scheduling & Run Cutting Software
 - Maintenance Management System
 - Driver Assignment & Workforce Management System
 - Yard Management System
 - Wireless LAN
 - Voice/Data Transmission



Survey Results – Operational

	Currently Deployed	Not Deployed and Plan to Implement	Not Deployed and No Plan to Implement
Scheduling & Run Cutting Software	52%	26%	22%
Maintenance Management System	57%	30%	13%
Driver Assignment & Workforce Management System	39%	17%	43%
Yard Management System	9%	22%	65%
Wireless LAN	26%	30%	39%
Voice Transmissions	62%	19%	19%
Data Transmissions	33%	29%	33%

- ❑ **Common Scheduling and Workforce Software include HASTUS and Trapeze**
- ❑ **Little interest in new deployments of Yard Management Systems**
- ❑ **Voice and Data Transmissions through owned or leased commercial networks**

Survey Results - General

- ❑ For those ITS technologies identified as to be deployed in the future, the top ten prioritized deployments are:

- ❑ Current state of preparedness of agencies to procure, deploy, and manage new ITS technologies:

1	Automatic Vehicle Location and/or Computer Aided Dispatch Capabilities
2	Scheduling and Run Cutting Software
3	Radio Voice Transmissions
4	Maintenance Management Systems
5	Smart Card Fare Payment
6	Radio Data Transmissions
7	Automatic Passenger Counters
8	Driver Assignment and Workforce Management Systems
9	Real Time Information Available On-Line
10	Registering Farebox

Qualified staff able to support deployment activities and ready to begin now	30%
Some staff able to support deployment activities but additional expertise required	55%
Do not have staff or expertise and unable to support deployment activities now	15%

Survey Results - General

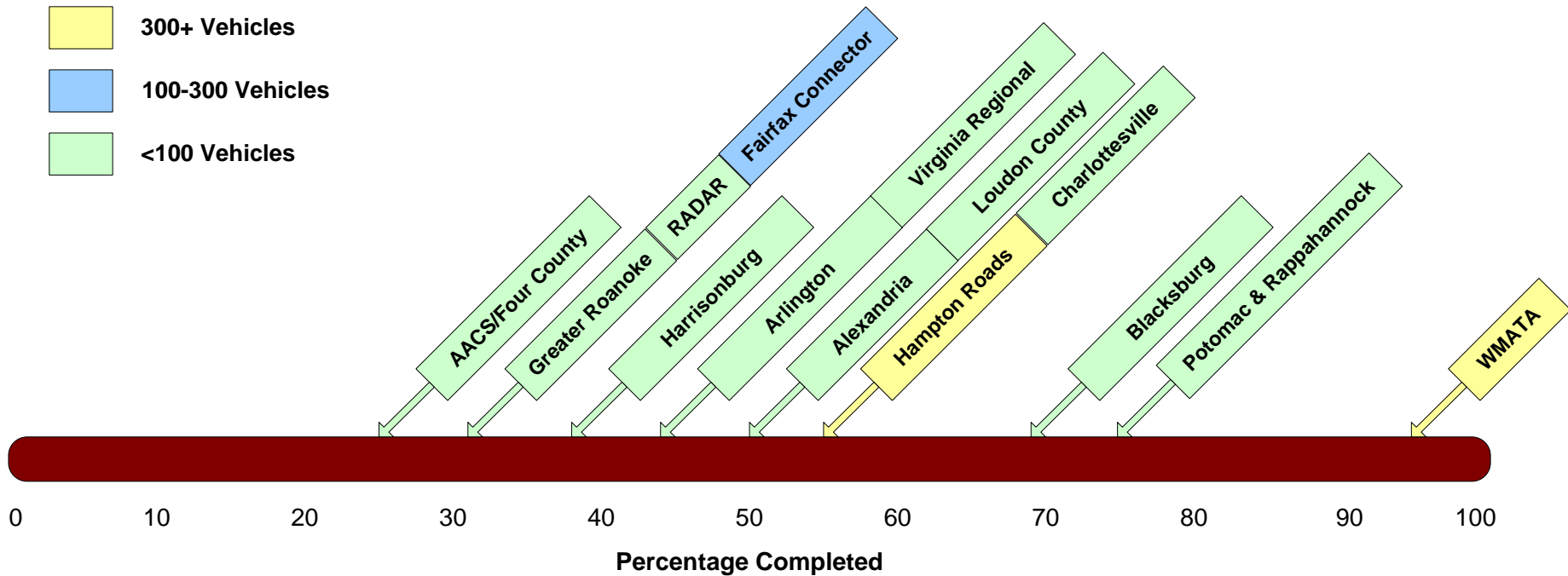
- ❑ Agency opinion regarding benefits / costs of ITS technologies deployed to date:

Benefits outweigh costs	50%
Benefits and costs are even	25%
Costs outweigh benefits	25%

- ❑ Customer feedback regarding deployed ITS technologies:

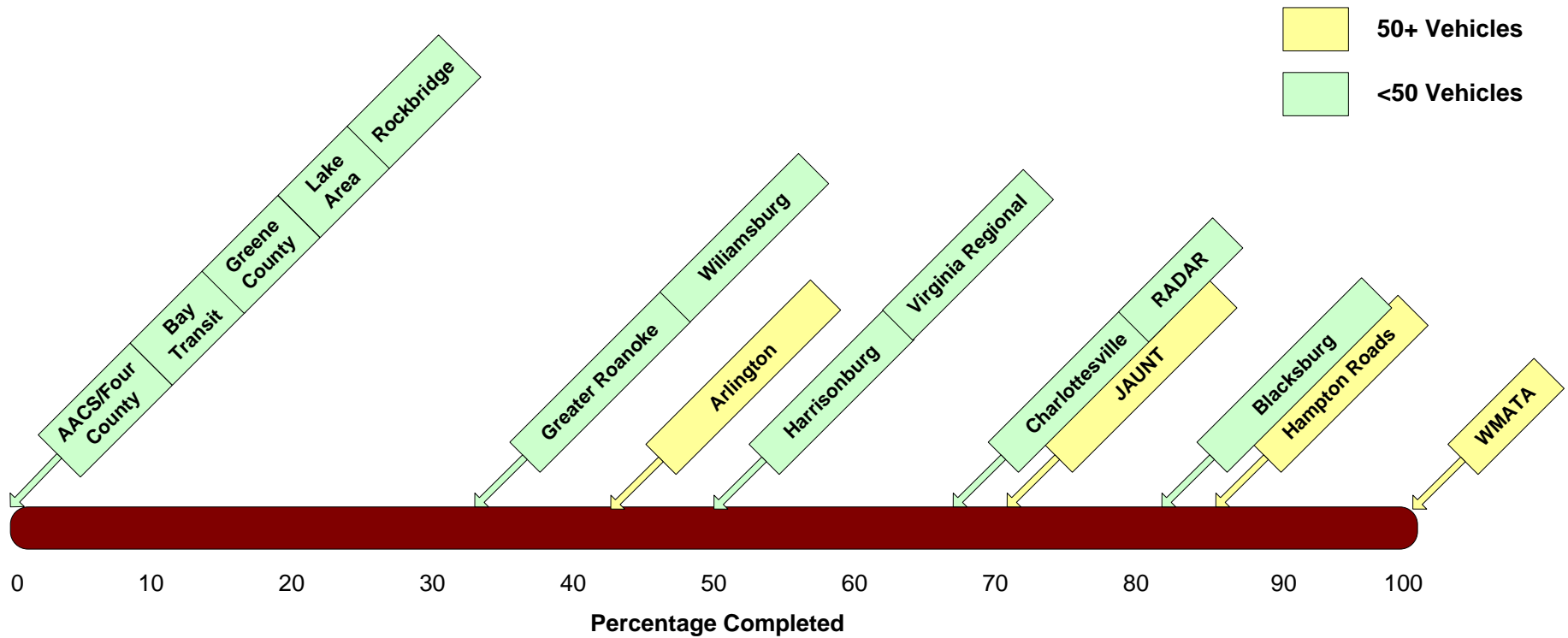
Positive feedback	71%
Neutral feedback	29%
Negative feedback	0%

Deployment Scale – Fixed-Route



- ❑ Level of deployment measured against recommended technology bundles for respective fleet size

Deployment Scale – Demand-Response



- ❑ Level of deployment measured against recommended technology bundles for respective fleet size

Evaluation Strategy

- ❑ Compare industry typical scenarios with current status
- ❑ Identify short, medium and long term projects for each agency to achieve typical deployment
- ❑ Customize with agency input
- ❑ Flexible plan to allow adjustment based on funding availability
- ❑ Identify performance measures for each technology
- ❑ Identify resource sharing opportunities

Resource Sharing

- ❑ Identify cross cutting projects and resource sharing opportunities based on:
 - Similar project timing
 - Regional proximity
 - Technical needs

- ❑ What are the market drivers?
 - Cost savings
 - Improved program coordination
 - Enhanced interaction between agencies and systems
 - Better consistency in levels and types of services provided



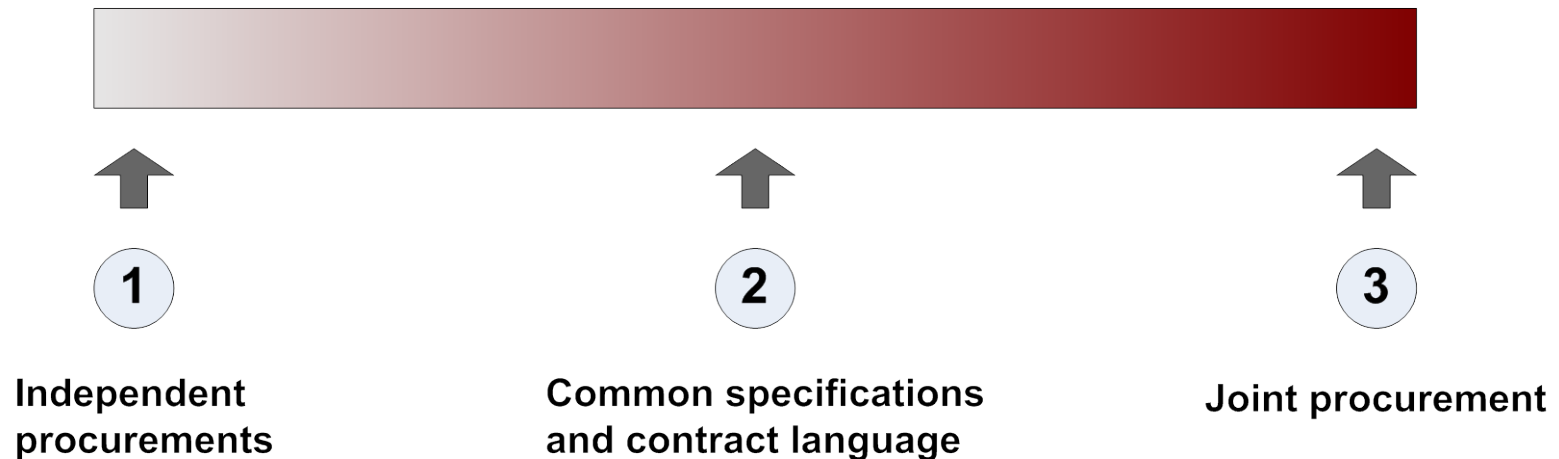
Resource Sharing

- ❑ What are the criteria to make it work?
 - Champions on both sides
 - A coordinated approach
 - Deployments based on customer need
 - Clearly defined requirements and interfaces
 - Promote knowledge sharing at beginning of 6-year plan
- ❑ Opportunities for resource sharing
 - 511 integration
 - Regional and statewide data sharing
 - Regional trip planning
 - Fare integration
 - Shared maintenance contracts
 - Shared parts inventory
 - Vendor certification



The image shows a screenshot of a web-based "TRIP PLANNER" interface, powered by Google. The interface is enclosed in a green border. At the top, it says "TRIP PLANNER" in large green letters, with "Powered by Google" in smaller text to the right. Below this, there are two input fields. The first is labeled "Start" and has a text box with the example address "e.g. 200 City Hall Ave, Norfolk, VA". The second is labeled "Destination" and has a text box with the example address "e.g. 600 Settlers Landing Rd, Hampton, VA". Below these fields is a grey button labeled "Get Directions". Underneath the button are two radio buttons: "Depart at" and "Arrive by". Below the radio buttons are two input boxes labeled "Date" and "Time". At the bottom of the interface, there is a link that says "read about the trip planner".

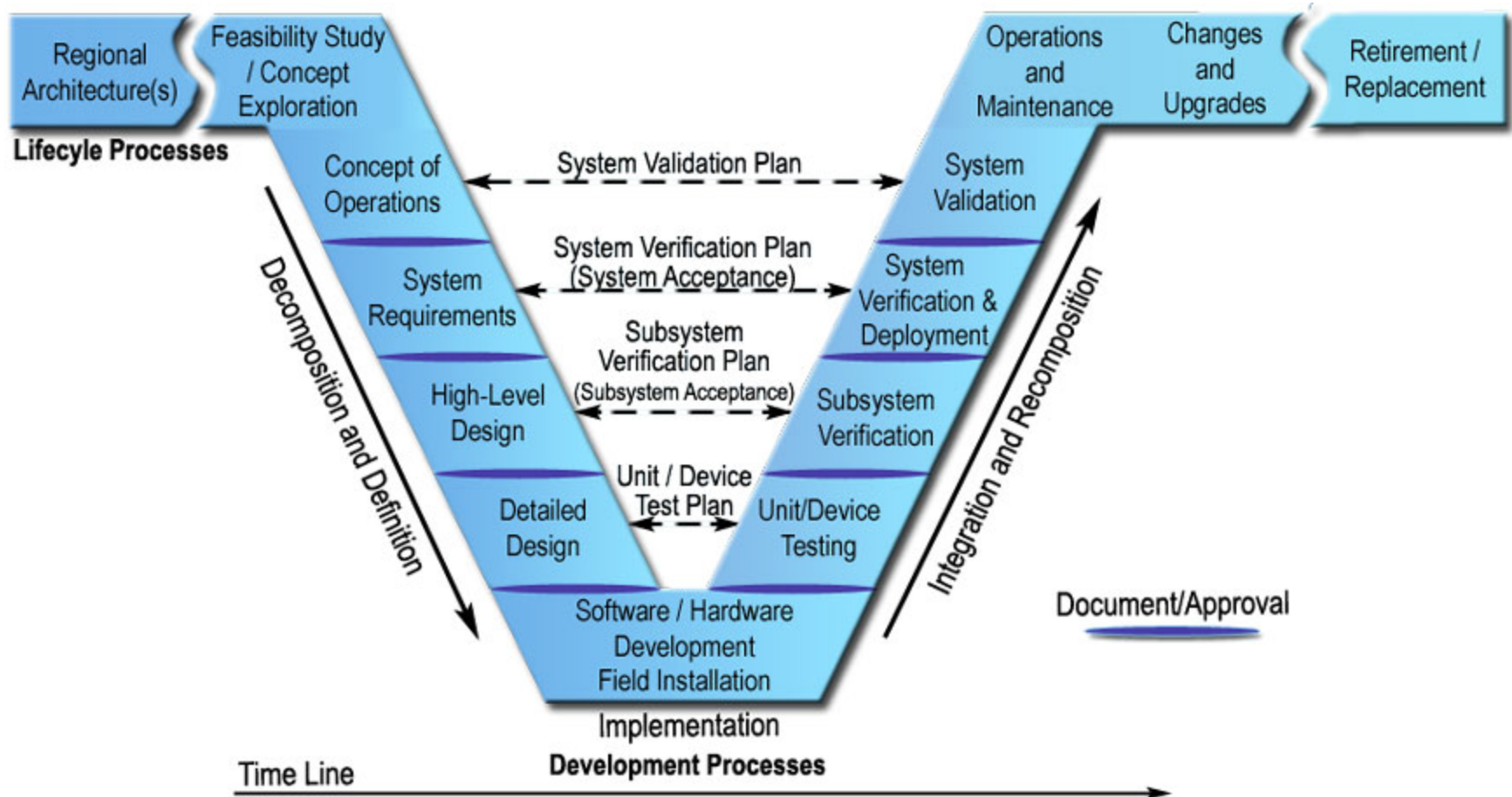
Procurement Process



- The most readily accessible approach is the middle ground**
- Collaboration to yield common technical configuration and specifications**
- Procurement support for Independent procurement processes**
- Provision for ITS in joint procurement of buses**

Scenarios – Other Considerations

❑ Systems engineering approach



Next Steps

- ❑ Upcoming workshop to present draft program for agency feedback – early June
- ❑ Final reports

Contacts

Michael Harris, DRPT

michael.harris@drpt.virginia.gov

Jeremy Siviter, IBI Group

jsiviter@ibigroup.com