

Integrated Corridor Management

Robert Sheehan
U.S. DOT ITS-Joint Program Office

Agenda

- Background
- ICM Program
- ICM Fundamentals
 - What is a corridor?
 - Integration challenges
 - Management approaches
- Demonstration Sites
- Next steps

The Reality: Operations Today

- Surface transportation systems are made up of several independent networks
 - Freeways, bus/rail transit, arterials, etc.
- Most efforts to reduce congestion have focused on optimization of individual networks
 - Agency/facility/mode – specific ITS systems & strategies
- Minimal cross-network management in response to increased demand / reduction in demand

ICM Program Vision

- An opportunity exists to realize significant improvements in the efficient movement of people and goods through aggressive and proactive management of major multimodal transportation corridors

Integrated Corridor Management





Dallas, TX (US 75)



- Pioneer Sites**
- Dallas, TX
 - Houston, TX
 - Minneapolis, MN
 - Montgomery County, MD
 - Oakland, CA
 - San Antonio, TX
 - San Diego, CA
 - Seattle, WA

San Diego, CA (I-15)



Integrated Corridor Management

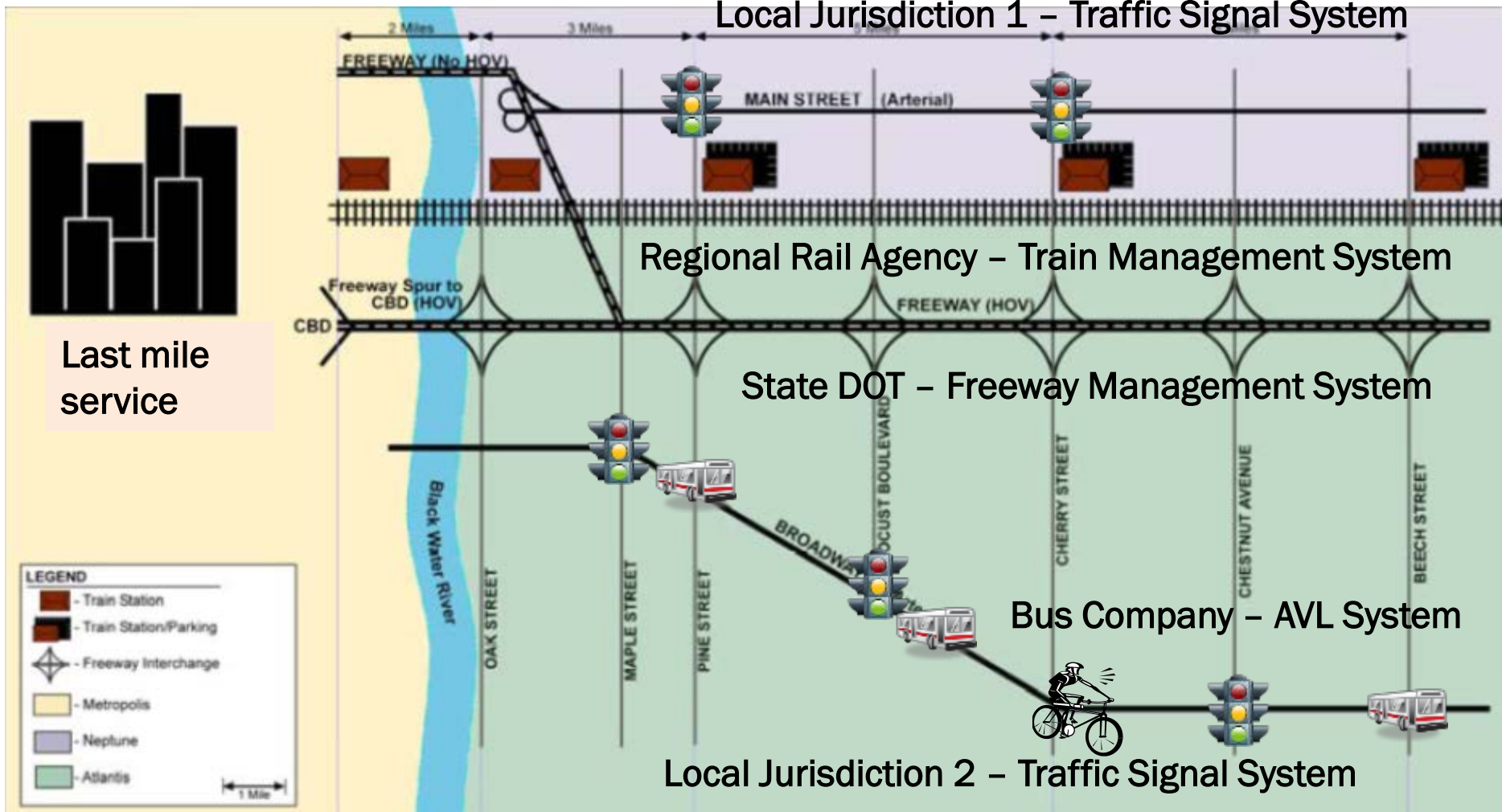
Let's take a closer look...

Corridor

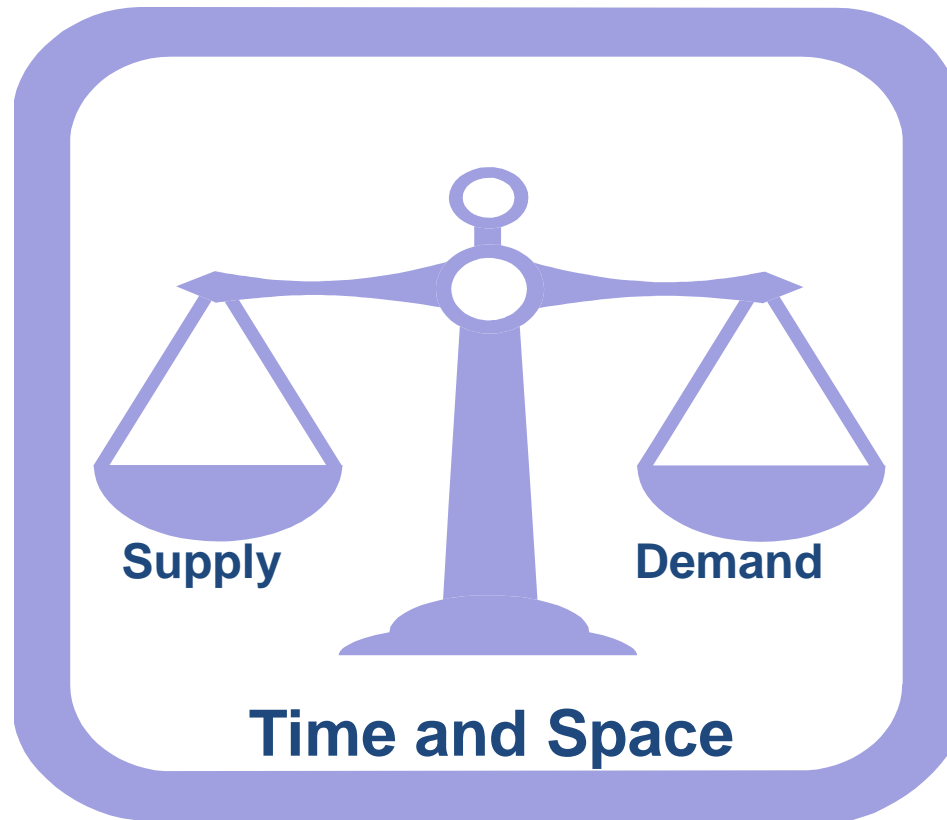
- Travel shed
- Linear geographic band
- Movement of people, goods, and services within and through the corridor
- Similar transportation needs and mobility issues
- Various networks that provide similar or complementary transportation functions
- Cross-network connections



Generic Corridor



Approaches and strategies based on the concept of Load Balancing



Integrated

Institutional Integration

Coordination to collaboration between various agencies and jurisdictions that transcends institutional boundaries.

Operational Integration

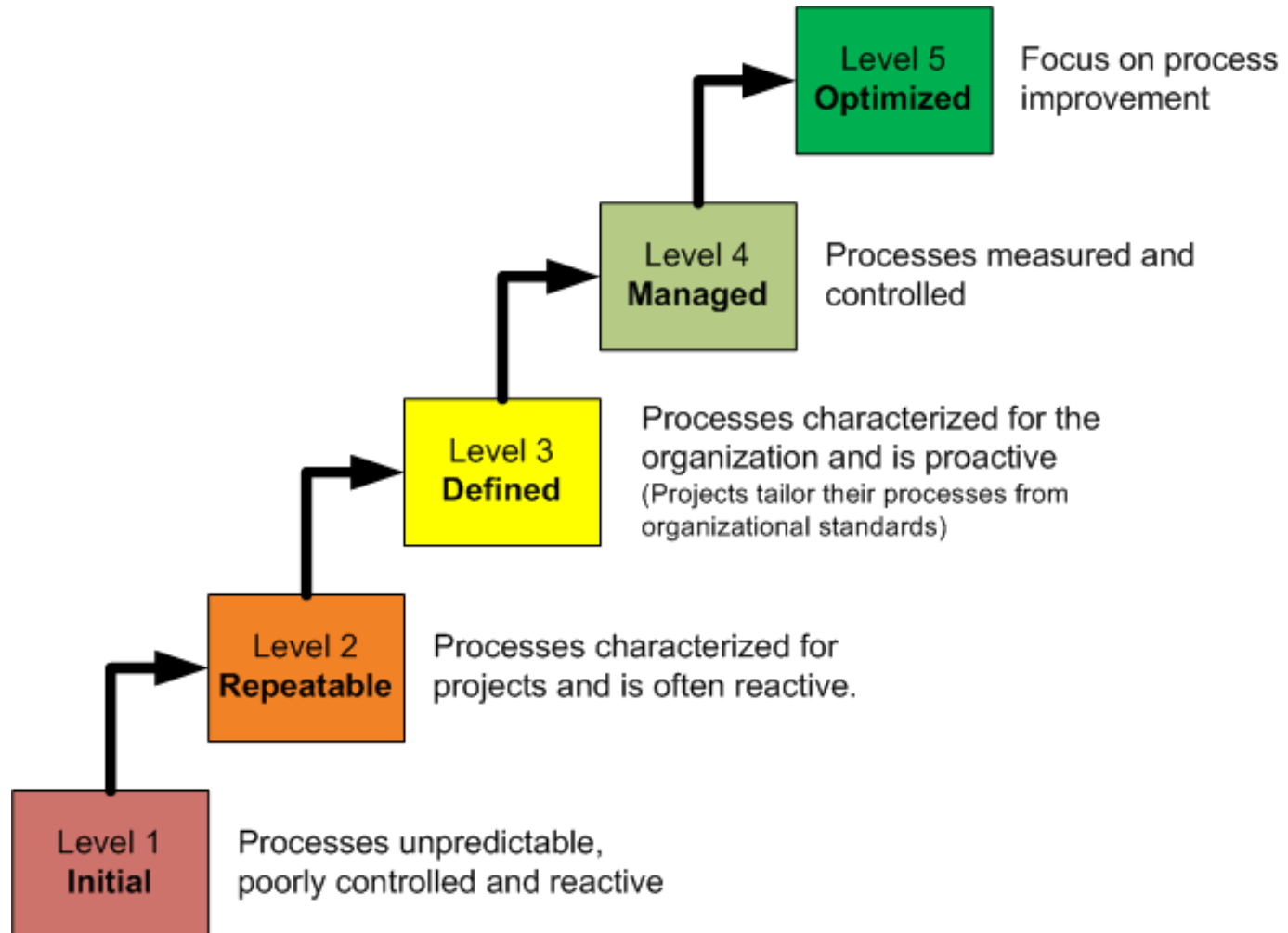
Multi-agency and cross-network operational strategies to manage the total capacity and demand of the corridor.

Technical Integration

Sharing and distribution of information, and system operations and control functions to support the immediate analysis and response.

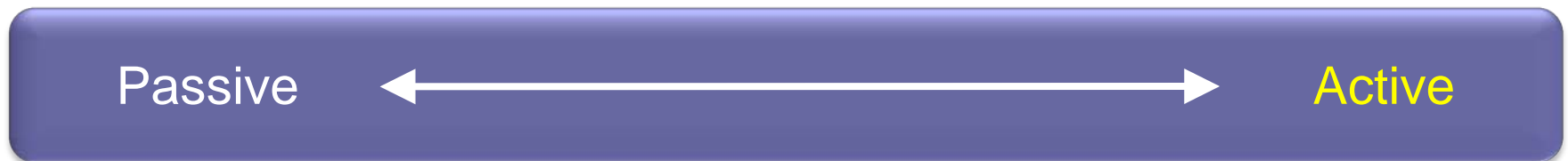


ICM – Capability Maturity Model

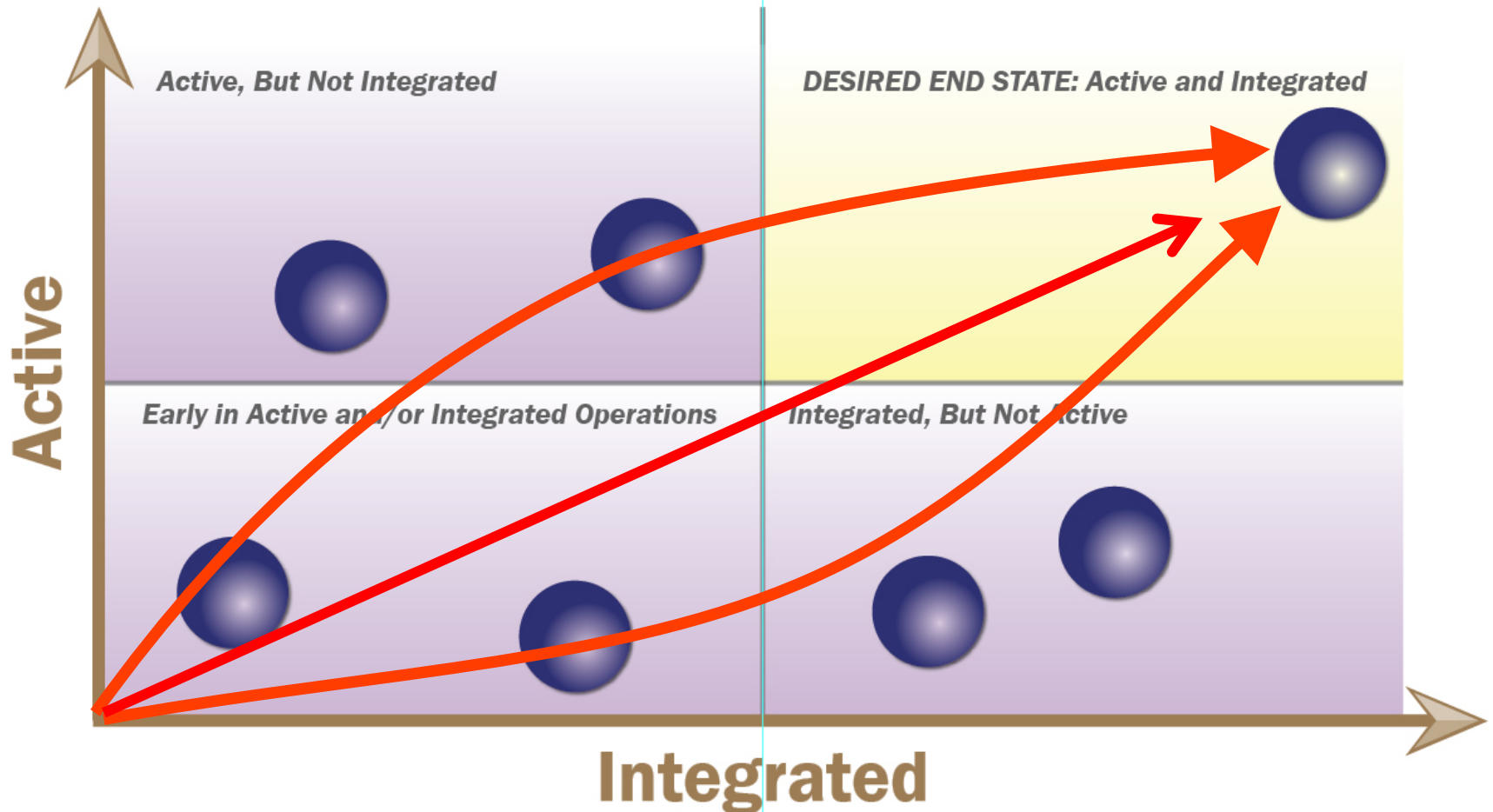


“Management”

ICM requires that the notion of *managed* corridors, and the *active management* of **ALL** individual facilities within the corridor, be considered.



The ACTIVE and INTEGRATED Continuum



Stakeholders

Who's here
today?
Who's missing?

**Roadway
Agencies**

**Planning
Organizations**

**Private
Sector**

**Transit
Agencies**

**Activity
Centers**

**Fleet
Operations**

**Public
Safety**

**Other agency
departments**

Traveler

Institutional Approaches

«« LESS FORMAL ««

»» MORE FORMAL »»

General agreements. No common objectives.

Ad hoc arrangements based on near-term issues and personal relationships and interests

Informal working groups that meet regularly to address topics of more effective use of existing corridor capacity

Operating objectives for each agency understood.

Formally established joint working groups with assigned responsibilities for ICM

Funded entity (i.e., a "corridor manager") with full-time staff and well-defined responsibilities related to ICM operations

Common operating objectives.

Dedicated resources, authorities, and a governing board that represents agencies in ICM development, implementation, and operation efforts

Integration Processes

LESS FORMAL			MORE FORMAL		
COORDINATING		COOPERATING		COLLABORATING	
<ul style="list-style-type: none">› Informal information sharing› Common use of terms› Coordinated actions› Coordinated service delivery		<ul style="list-style-type: none">› Corridor information sharing› Corridor performance measurement› Corridor operating policy development› Corridor concept of operations› ICM requirements		<ul style="list-style-type: none">› Shared corridor operations vision› Formal institutional partnering› Integration and interoperability planning› Joint ICMS project development› Shared use of resources	

ICM Technical Protocols



LESS FORMAL



MORE FORMAL



Alerts provided to stakeholder TMCs through Regional or Corridor ITS Architecture ITS information connectivity features. TMCs take action based communication among the stakeholders.

Corridor manager requests stakeholder TMC's to provide particular controls according to ICM Operations Plan. Stakeholder may modify request before taking action. Modifications are reported to corridor manager.

Corridor manager directs stakeholder TMC to provide particular controls according to ICM Operation Plan.

Decision Support System OR Corridor manager directly controls corridor field devices (traveler information messages, signal timing, lane controls, transit priority, etc.) through ICMS according to agreed upon ICM Operations Plan.

ICM Operational Approaches



LESS INTEGRATION



MORE INTEGRATION



Information Sharing/Distribution

- Information sharing (data, video)
- Information clearinghouse
- Corridor ATIS
- Using traveler information devices to describe conditions in other networks
- Shared control of CCTV

Operational Efficiency of Network Junctions

- Signal priority for transit
- Multi-modal electronic payment
- Transit hub connection protection
- Coordinated ramp metering/arterial signals

Accommodate/Promote Route & Modal Shifts

- Modify arterial signal timing/metering rates/transit priority to accommodate shifts
- Promote route/mode shifts via en-route traveler info devices
- Re-route buses

Manage Capacity-Demand Relationship (short/long term)

- Lane use control
- Convert regular lanes to transit
- Add transit capacity (additional vehicles/reduced headways)
- Open HOV lanes/shoulders
- Modify HOV requirements
- Variable speed limits
- Modify toll/transit/parking pricing

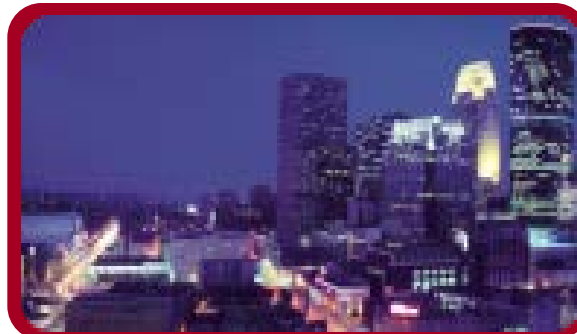


ICM Analysis, Modeling, and Simulation Sites

**US-75,
Dallas, TX**



**I-394,
Minneapolis, MN**







**I-15,
San Diego, CA**

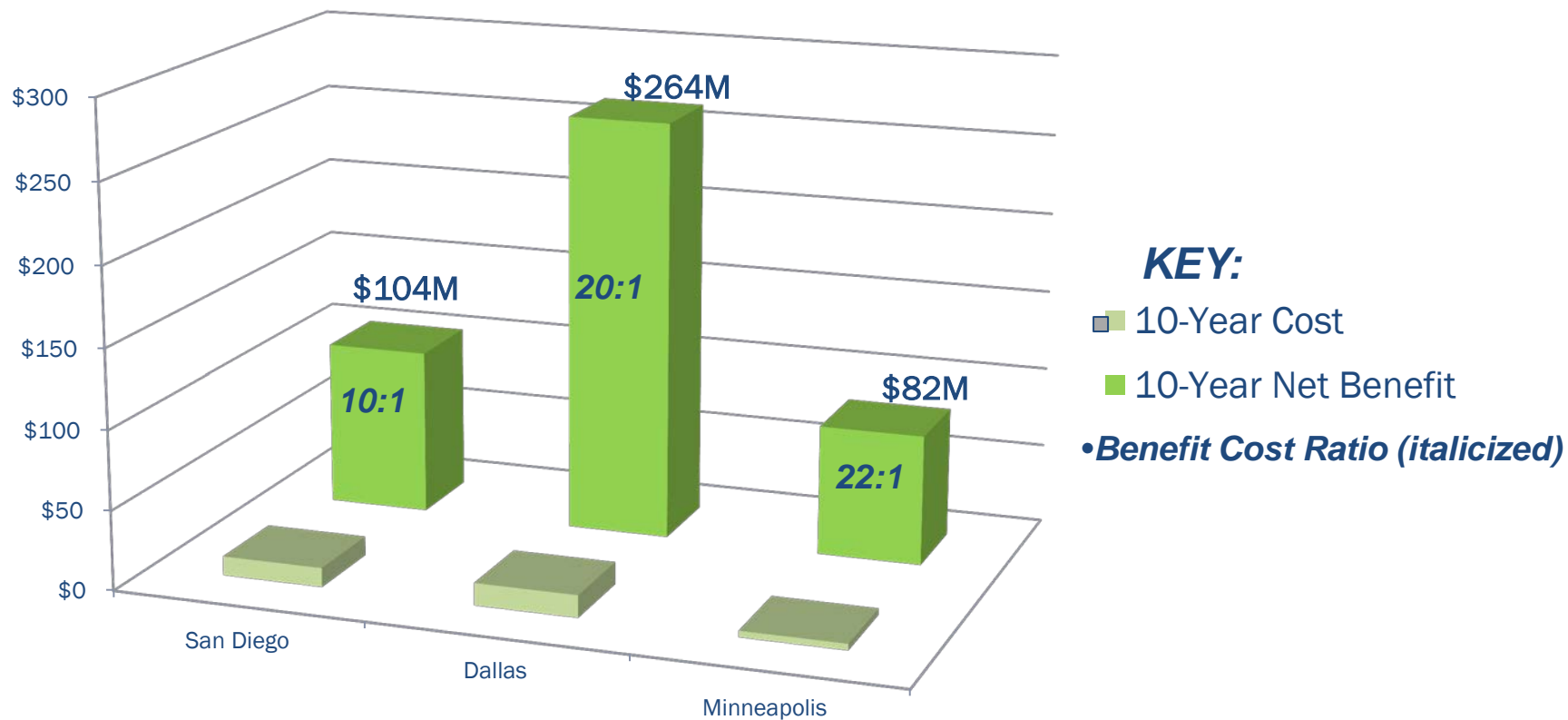


Potential Benefits of ICM

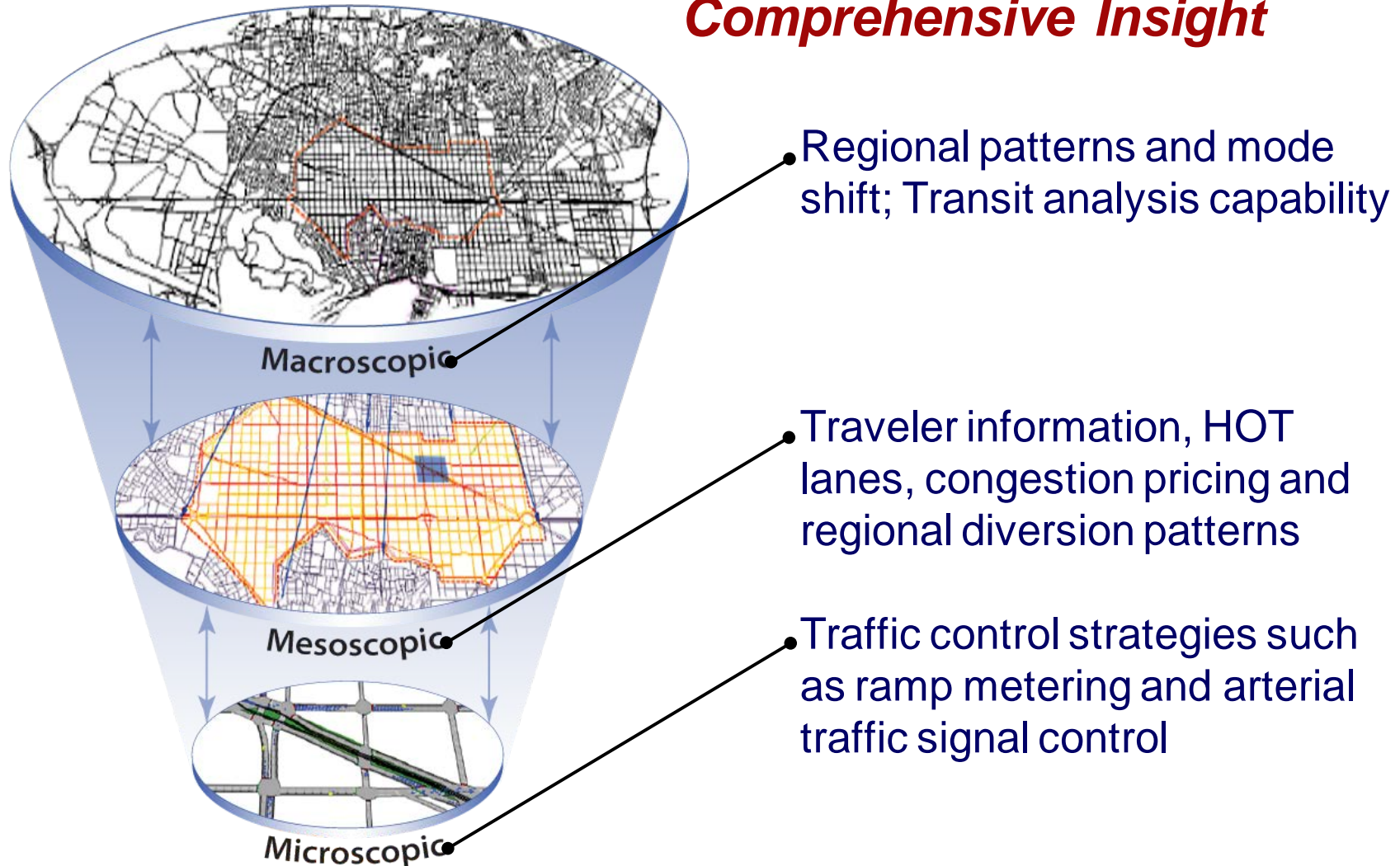
Three AMS Sites – Dallas, Minneapolis, and San Diego

PERFORMANCE MEASURE AREAS		San Diego	Dallas	Minneapolis
	Annual Travel Time Savings (Person-Hours)	246,000	740,000	132,000
	Improvement in Travel-Time Reliability (Reduction in Travel-Time Variance)	10.6%	3%	4.4%
	Fuel Saved Annually (in Gallons)	323,000	981,000	17,600
	Tons of Mobile Emissions Saved Annually (in Tons)	3,100	9,400	175

ICM Benefits Far Outweigh Costs



Multi-level Analysis Tools Provide Comprehensive Insight



ICM Demonstration Sites

I-15, San Diego, CA



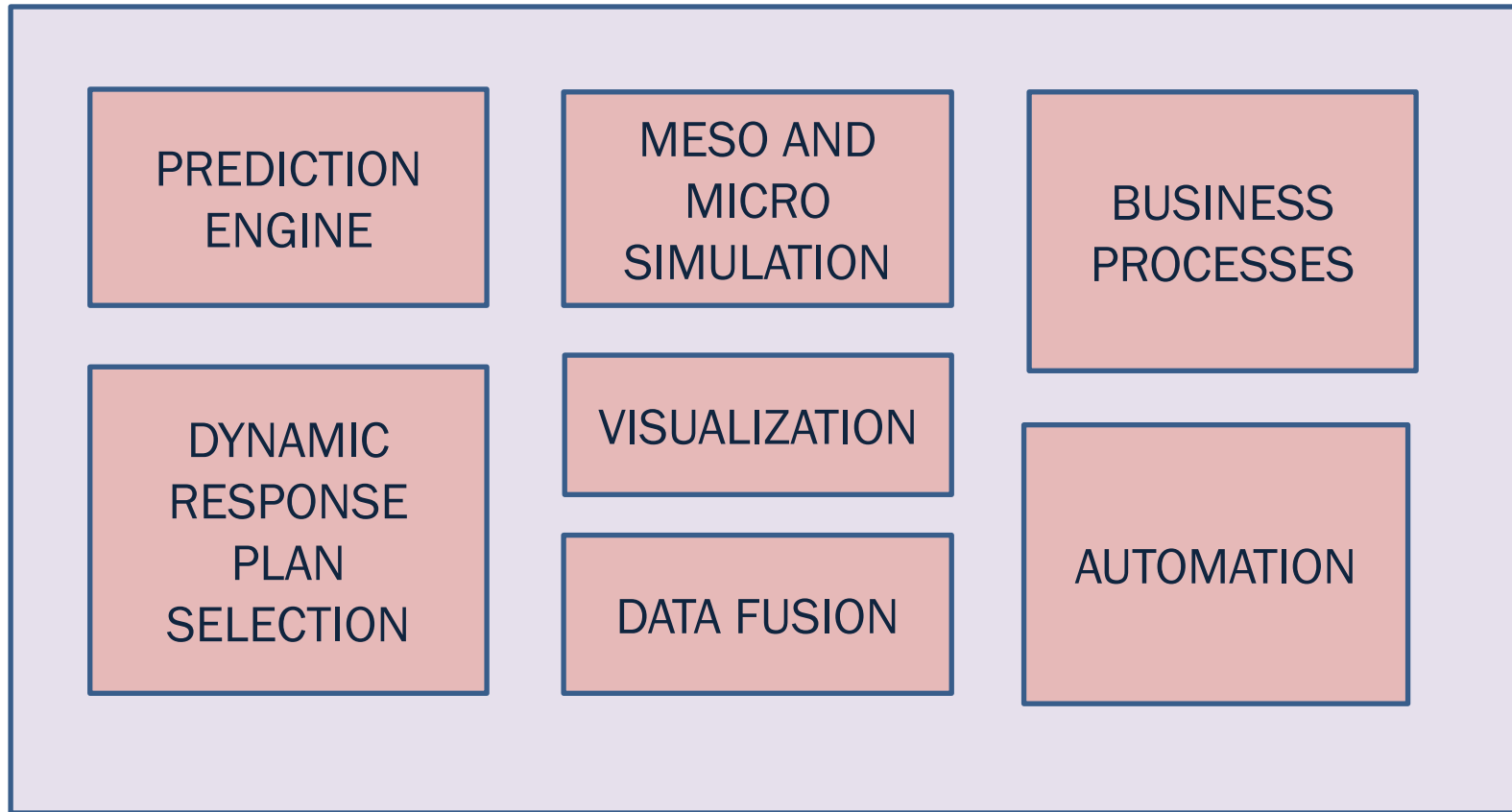
US-75, Dallas, TX



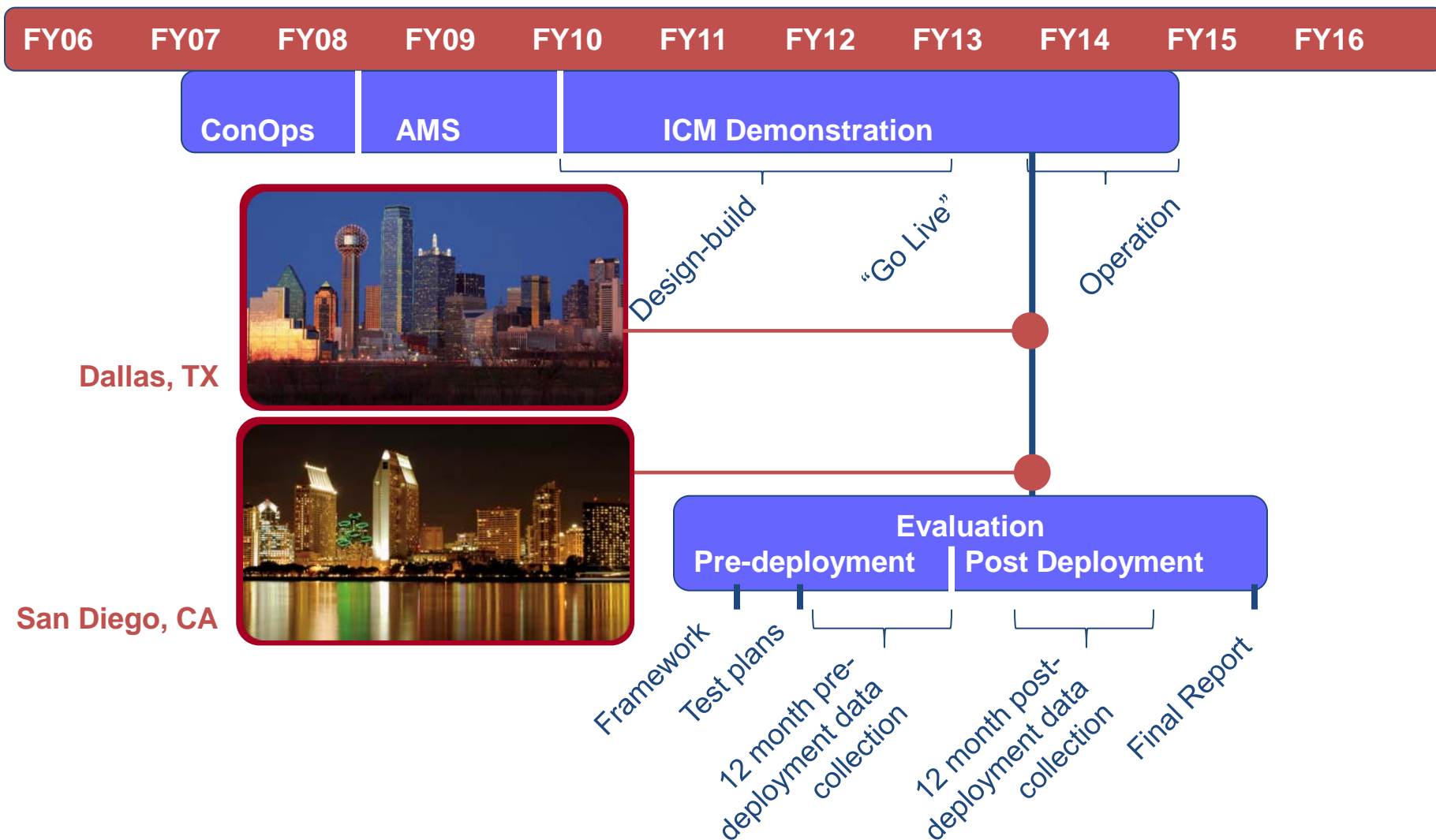
Demonstrations Include:

- Joints operations agreements
- Transit options – LRT and BRT
- Mode, route, time shift approaches
- Improved junctions between modes and facilities
- Real-time multi-modal data integration
- Parking systems
- Responsive signal and meter operations
- Data availability to public/private
- Advanced Traveler Information approaches
- Shared and automated control
- **Decisions Support Systems**

Real-Time Decision Support Systems



Demonstration/Evaluation Schedule



What's next for ICM Program?

- ICM Demonstration operations
- ICM Demonstration evaluation
- ICM Deployment Planning Grants selection
- Technology transfer and Technical support
- Follow up research
- A second webinar, February 27, from 10:00–11:00 PST. Case Study
- The third and final webinar, March 27, from 10:00-11:00 PST. Case studies of smaller scale applications of ICM concepts from around the country.

Contact

Bob Sheehan

ITS Multi-modal Program
Manager

ITS Joint Program Office
202-366-6817

Robert.Sheehan@dot.gov

Neil Spiller

ICM Program Manager
FHWA Office of Operations
202-466-2188

Neil.Spiller@dot.gov