MINNESOTA'S SYSTEMS DEVELOPMENT AND LINK TO INVESTMENT STRATEGIES

NRITS
AUGUST 2013

AGENDA

Strategies through Our Regional Context

- Operational History
- Major Urban Phases
- MnPASS Congestion Strategy
- Linkage to Rural ITS

OUR ITS CONTEXT

- Metro population about 3M
- Growing- clear linkage to regional centers
- Very large state highway network that competes for funds
- Efficient transit network with dedicated funding to expand LRT network
- Minimal freight related issues
- A political environment that continually challenges our operational strategies
- A DOT that actively seeks operational, multi-modal and technology solutions first, and geometric solutions second

IN THE BEGINNING

- 1972
- Ramp meters, sensors, changeable message signs, traffic management center
- Original Goal: move more cars in the peak period
- Many of our systems are now on fourth or fifth generation
- Early challenges were around technology and infrastructure capabilities, recent challenges are around stakeholder support

OUR OPERATIONAL PHASES OVER 4O+ YEARS

1. The beginning : one road
2. Expansion of the same : replicate to viable highways, about one per year until built out in 2009
3. Add systems : cameras, FM radio, traveler information, fiber network, work zones
4. Add field operations : Service patrols, formal incident management programs, construction timing, agency integration
5. Focus on Vehicle occupancy : car pool lanes, parking systems, ramp meter by-passes, transit operations

OUR OPERATIONAL PHASES OVER 4O+ YEARS

6. Transit priority : bus shoulders, express bus with mega park and rides
7. Choice : tolling, telework, multi-modal
8. Geometric shift : low/cost high benefit projects, performance based designs, shoulder repurposing, Towards Zero Death systems
9. Manage by lane : MnPASS HOT lanes, Active Traffic Management, peak period shoulder operations
10. Next : systems integration, state wide ITS network, MnPASS network, vehicle – infrastructure integration, other?

OUR APPROACH TO OPERATIONAL STRATEGIES

Systems Philosophy

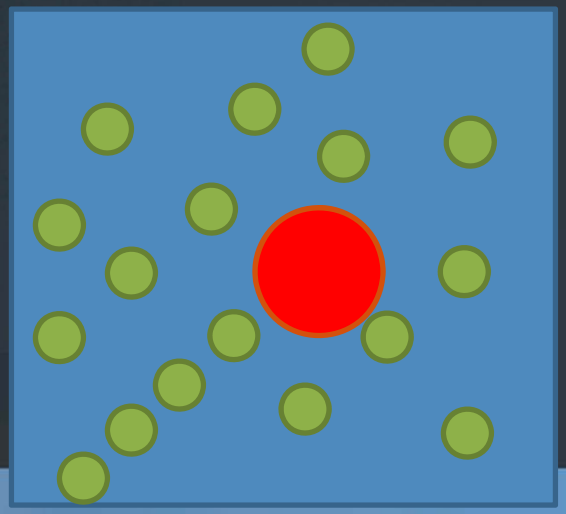
- Pilot it
- Improve it
- Expand it
- Institutionalize it
- Plan the strategy's next generation
- Repeat for next strategy

Changing goals over time show evolution of strategy:

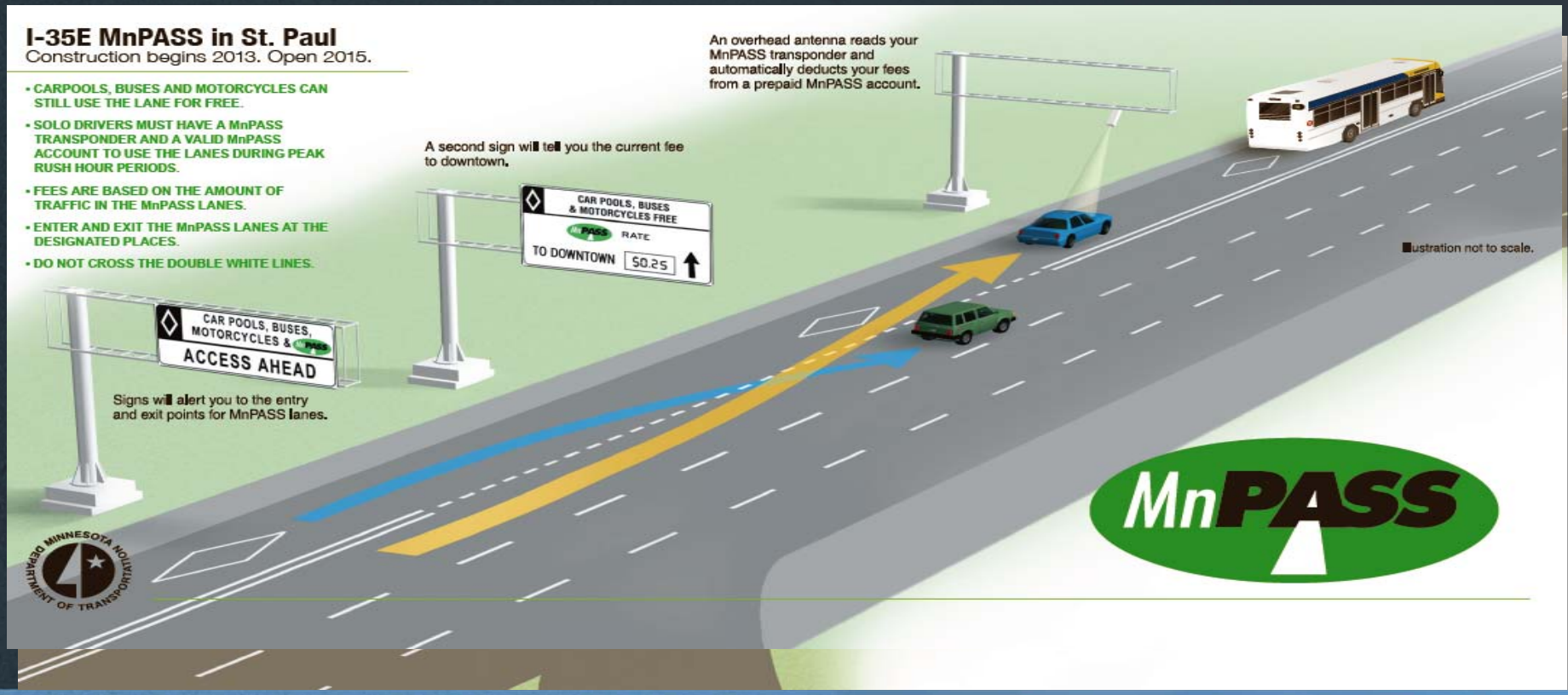
Move more cars → Move more people
Inform all drivers → Inform individual drivers
Encourage mode shift →Provide Choice (and revenue)
Expand (traditional large projects) → Many small projects
Safety via Engineering → Zero Fatalities via TZD 4E's (RURAL focus, ITS priority)

CAPITAL INVESTMENT STRATEGIES

- Regional shift in mobility investments from major capital projects for mobility improvement to lower cost/high benefit projects and technology solutions
- Shift occurred due to lack of funding for major projects AND because a series of small projects regionally distributed provided more system benefits then a single large project
- Shift made MnPASS the expansion/congestion strategy
- Lower Cost/High benefit examples
    - Auxiliary lanes
    - Multi-lane ramps
    - Non-traditional interchanges
    - Shoulder use for buses and peak period HOT lanes
- Both a Corridor and a Regional Strategy
- Both MnSHIP and TFAC reflect these investment strategies

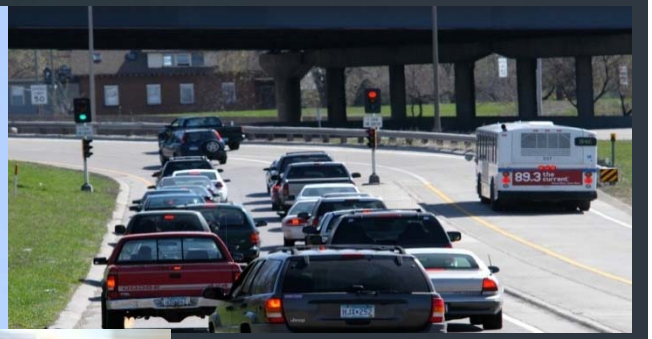


WHAT IS MNPASS?



MNPASS SYSTEM LAYER

- MnPASS enabled by underlying systems



MNPASS = EXISTING SYSTEM AND NEW LAYER

Existing Tech (in-source)

- Communication network
- Traffic Sensors
- Dynamic Message Signs
- Cameras
- Gates for Reversible Road
- Traffic Management Center/Systems
- Incident Mgmt. Systems

New Technology (out-source)

- Toll Systems
  - Transponders
  - Pricing Signs
  - Toll Readers
  - Communications
- Back office
  - Transactions
  - Customer Service
  - Monitoring
- Enforcement

OUR MNPASS STRATEGY

- Phase 1: Convert HOV lanes (2005 to 2009)
- Phase 2: Make shoulders HOT lanes (2010)
- Phase 3: Regional network: All expansion projects are HOT lanes (2011+)
- Goals:
  - Make congestion a choice for customer
  - Set pricing to manage performance long term, not to maximize revenue
  - Coordinate transit investments with MnPASS investments
- Outcome: MNPASS lane carries 2x people of general lane in peak hour

PROS AND CONS OF MNPASS LANES

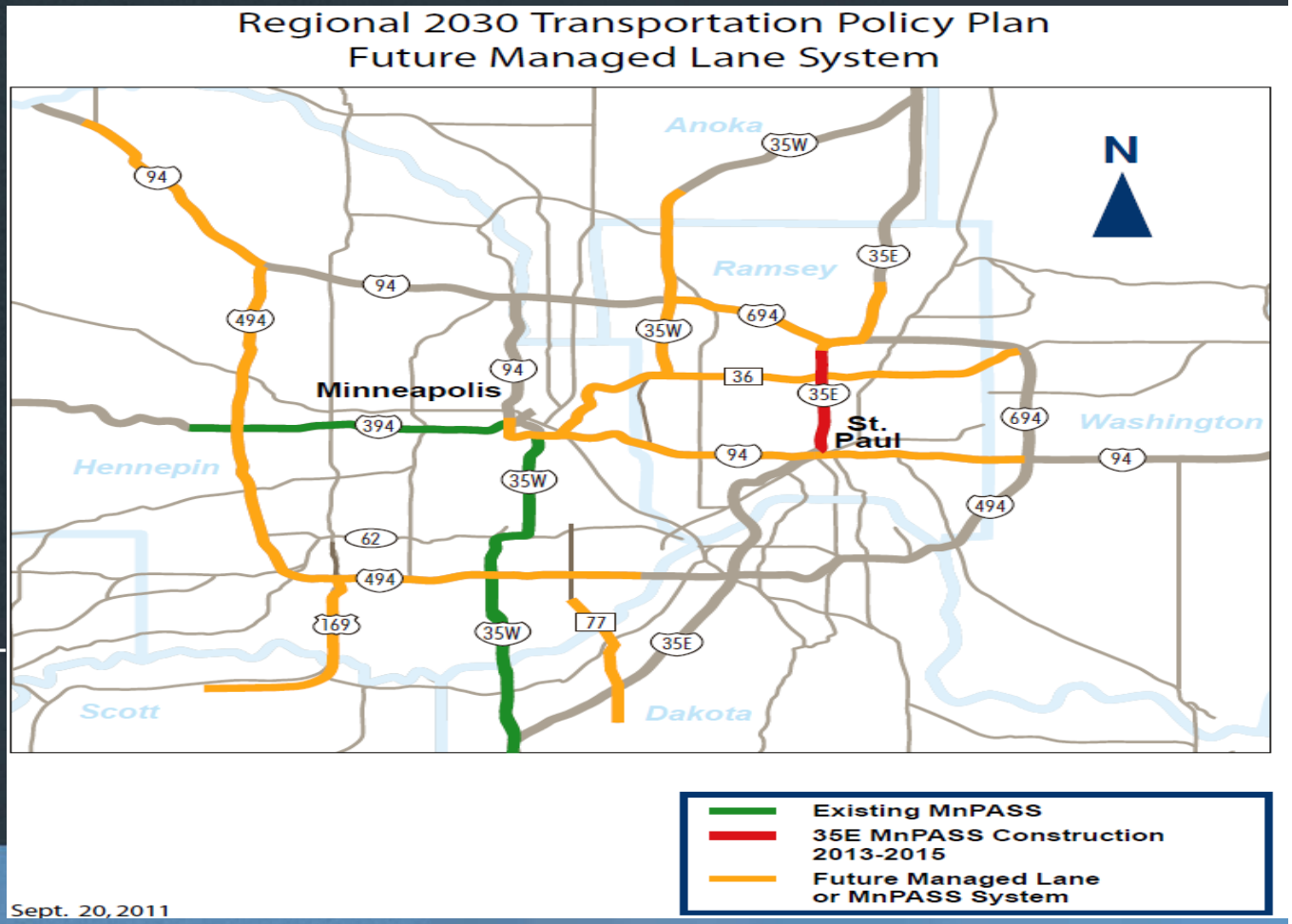
PROs

- The only sustainable way to protect congestion investments
  - Variable pricing manages performance for long term
  - Reduces need for future investments
- User makes the choice
- MnPASS lanes are multi-modal
- Technology allows many options in how lanes operate
- Transit **prefers** a MnPASS lane to Bus shoulder
- MnPASS lanes provide some revenue
- Customers really like MnPASS lanes

- CONs
  - HOT lanes are substantially harder to implement then traditional lane
  - Freight industry has strong opinions on MnPASS lanes

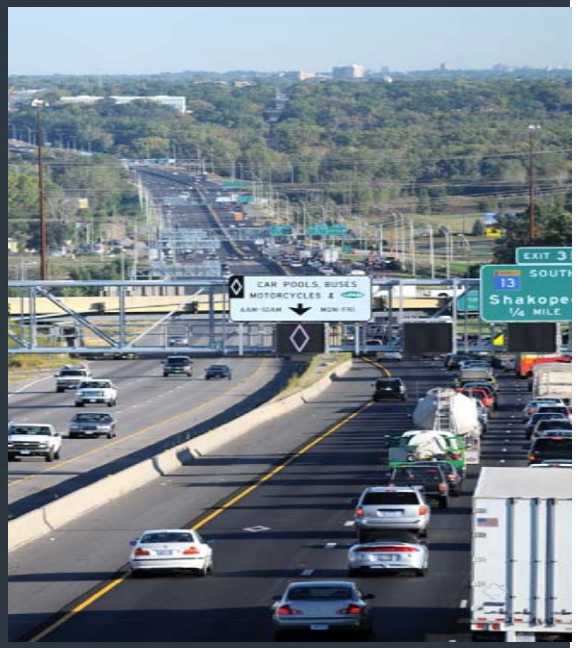
THE PLAN: REGIONAL MNPASS NETWORK

- MnPASS – MN's congestion pricing brand name/HOT lane
- Operates during peak weekday AM & PM rush hours – free and open to all during non-peak
- Buses, carpools (2+) & motorcycles use for free – solo drivers can choose to use for a fee avg. $1.25-$1.50



CHALLENGES FACING MNPASS EXPANSION

- The next corridors have urban/semi-rural boundaries
  - Reoccurring congestion on the edge is limited
  - Traveler profile is a harder to reach market for transponders
    - Varied Destinations
    - Recreational
    - Freight
  - Multi-modal benefits are limited
- The next corridors are long and thus have high cost
- Concept adoption will present new challenges with local communities



CONCLUSIONS

- Corridors and strategies evolve
- Multiple and integrated strategies are needed
- Lower cost options have higher ROI
- Pricing is key to long term congestion issues
- Technology presents many opportunities to meet goals
- Link ITS strategies to regional plans to secure investment
- Operational strategies are complex and have unique stakeholder and funding challenges
- Many of these URBAN Conclusions mirror our approaches for our RURAL ITS Strategies

WHAT'S NEXT – RURAL MN ITS

SIMILAR PHILOSOPHY TO URBAN, DIFFERENT SCALE/ STAGE/ INTEGRATION

- Rural Conflict Warning Systems
  - Pilot it
  - Improve it
  - Expand it
  - Institutionalize it (State, County, City)
  - Plan the strategy's next generation
- High Accuracy Mapping
  - Potential TZD strategy
  - Early pilot stage
- Integrated Statewide ITS Operations
  - Technology is ahead of the Operational Concept
- Automated Enforcement

THANK YOU

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