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**CHALLENGES, LESSONS LEARNED, AND QUESTIONS
for Further Research for Signing Managed-Lane Projects in Florida**



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Florida Managed Lane Projects

- I-595 reversible lanes (in use)
- I-95 Miami-Dade County (in use)
- I-75 Broward County (under construction)
- I-4 Orlando (under construction)
- I-95 Broward County (under construction)

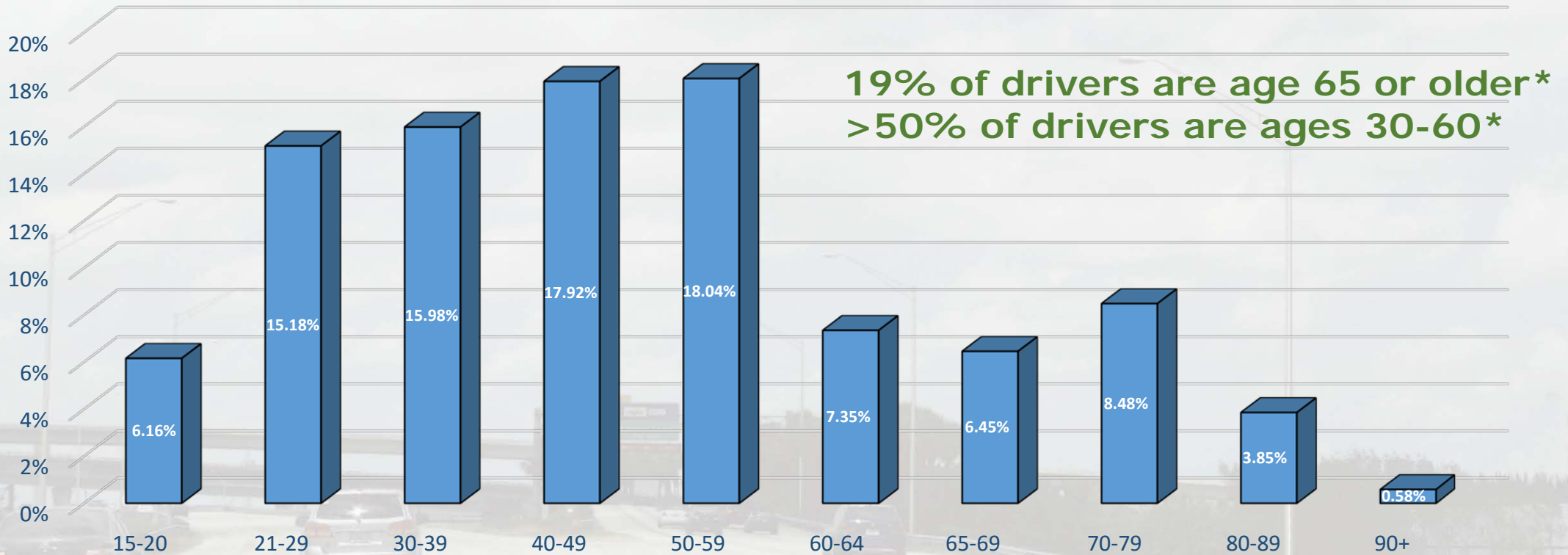




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Central/South Florida Population Facts

Percentage of Drivers



*2014 data



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Florida Tourists

- MIA and FLL airports reported 71 million passengers in 2015
- 37% were international passengers
- Rental car agencies have a program that equips cars with SunPass transponders; customers pay through the rental agency





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Challenges

Complex pre-entry decision making process

- Where does express lane take me?
- Can I use express lane and get off at my exit?
- How much will it cost?
- How reliable will my trip be?
- Do I need my trip to be reliable?
- Where do I enter the express lane?
- Should I take the express lane?
- What does my GPS tell me to do?

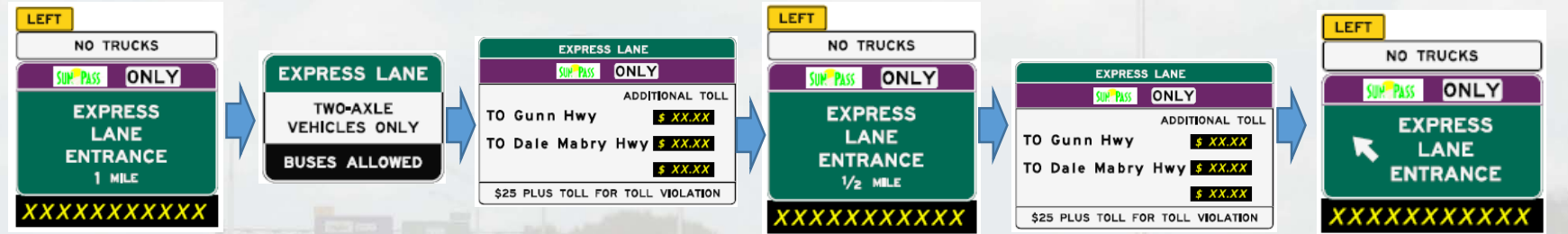




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Sign Sequence

MUTCD Example



Florida Standard

2 Mile

1 Mile

1/2 Mile

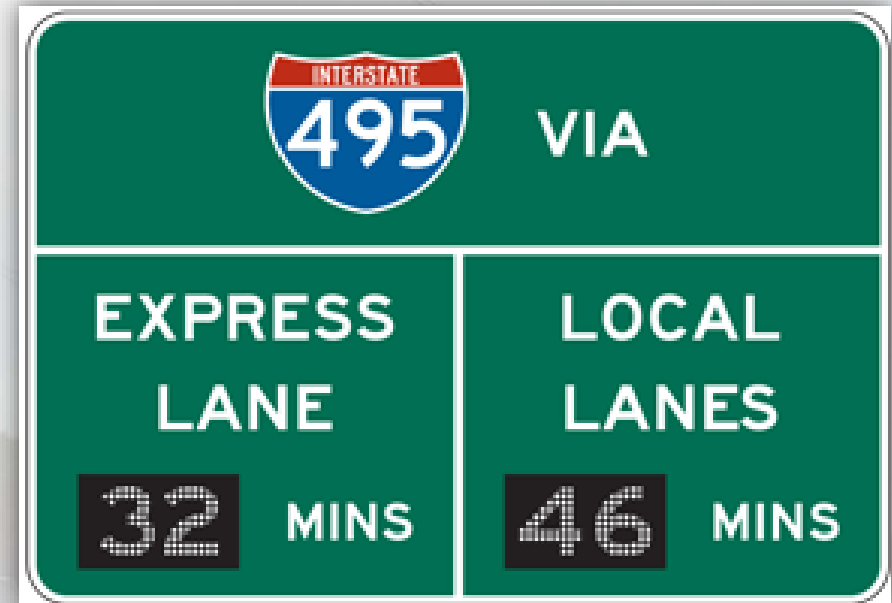
Entrance



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Entry Point Sign Sequence

- In Florida, comparative travel times between express lanes and general use lanes is *not recommended*
- Florida customers have interpreted travel time comparisons as guarantees
 - *Results in customer complaints if conditions change downstream*





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Sign Enhancements

- Florida has adopted a policy of non-illuminated overhead signs when using Type XI reflective sheeting
- Investigate use of **lenticular film** for general purpose signs
 - Reduces view cone
 - May reduce reflective properties requiring illumination





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Challenges

Express lane exits

- Driver visibility of *both* general purpose and managed lane exit signs can be confusing
- How to label exits? By name? By route? By exit number?
- As signs get larger, structures become larger. In South Florida, signs are designed for 150 mph wind loads, resulting in extremely large structures!
- How to coordinate signs with directions given by GPS devices and apps (Garmin, Google Maps, Bing, Waze)

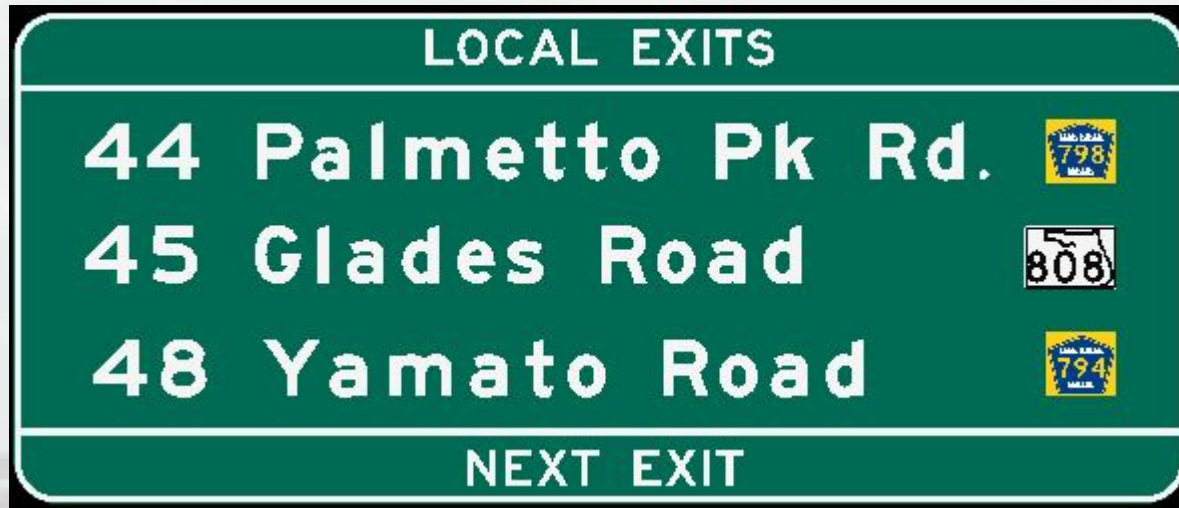




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Suggested Enhancements

- In lieu of local express lane exit signs with exit numbers/street names/route markers, consider denoting exits by city/town name



Decreases sign panel area by 48%



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Suggested Enhancements

- In lieu of local express lane exit signs with exit numbers/street names/route markers, consider denoting exits by city/town name



May be clearer to a tourist

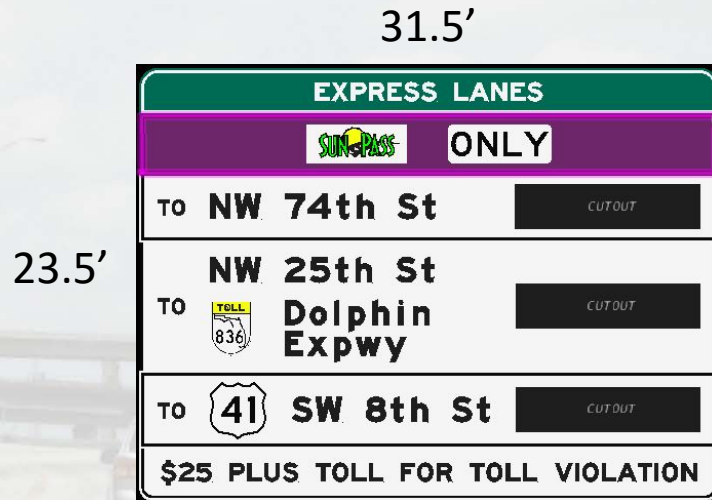




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Suggested Enhancements

- Decrease size of signs – Review amount of information
 - Address statutory toll violation signs
 - Letter sizing
 - Use of DMS?
 - Two-destination max, multiple signs?





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Express

General Use



NO TRUCKS

SUNPASS ONLY

INTERSTATE 75 NORTH

EXPRESS LANES

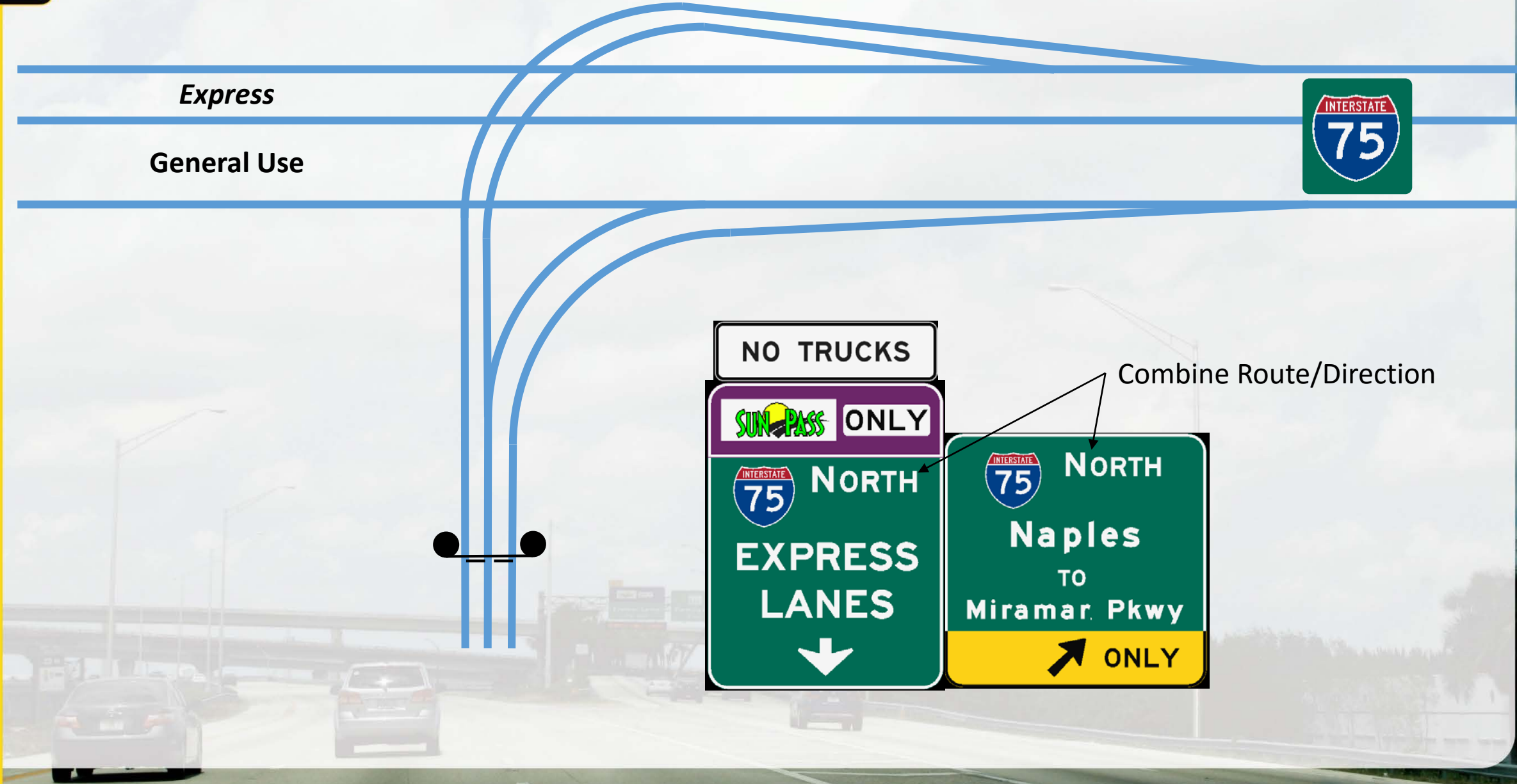
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INTERSTATE 75 NORTH

Naples TO Miramar Pkwy

↗ ONLY

Combine Route/Direction





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Other Lessons Learned

Coordination of multi-phased construction

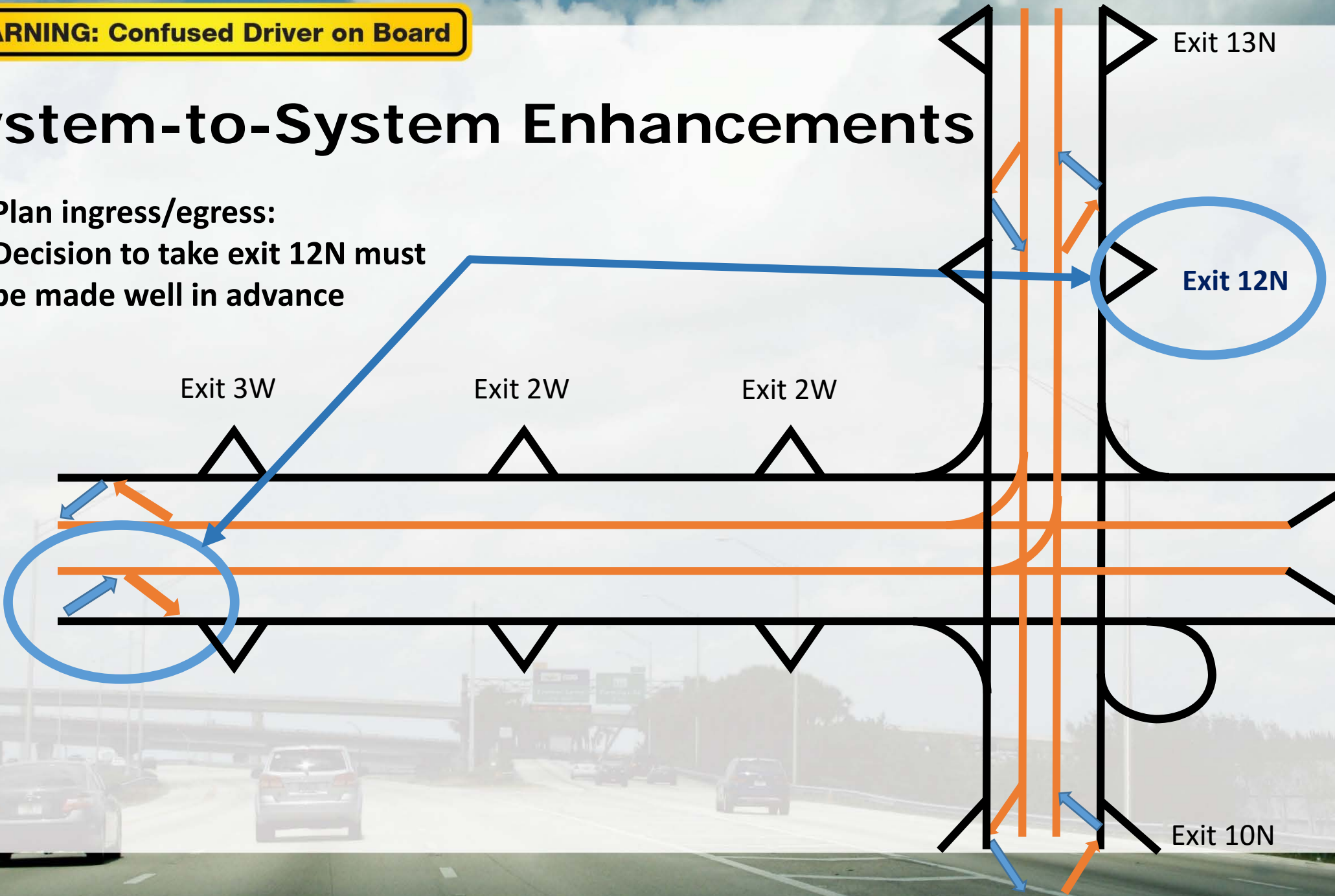




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System-to-System Enhancements

Plan ingress/egress:
Decision to take exit 12N must
be made well in advance

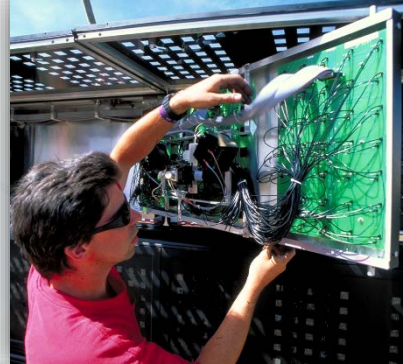




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ITS Components

- **Complementary to signing programs**
 - DMS
 - CCTV cameras
 - Sign verification cameras
 - Vehicle detection systems
 - Power systems
 - Communication system
 - Transportation management center





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Multi-Phased Approach

- **Budgetary constraints requires multiphase approach to implementing managed lanes**
- **Decisions in earlier phases accommodate later phase decisions**
 - Plan for future expansion
 - Minimal downtime of system will require emergency generators/UPS
 - Plan adequate space
 - Tolling sites
 - ITS equipment
 - Underground utilities (ITS power, tolling, lighting)
 - Sign foundations and design





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Questions?

