

# BACK *To The* STREETS

**Don't Give Up  
at the Intersection!**  
Design & Implementation  
of a Critical Component of  
Complete Streets



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**Code: SSS2023**



# Don't Give Up at the Intersection

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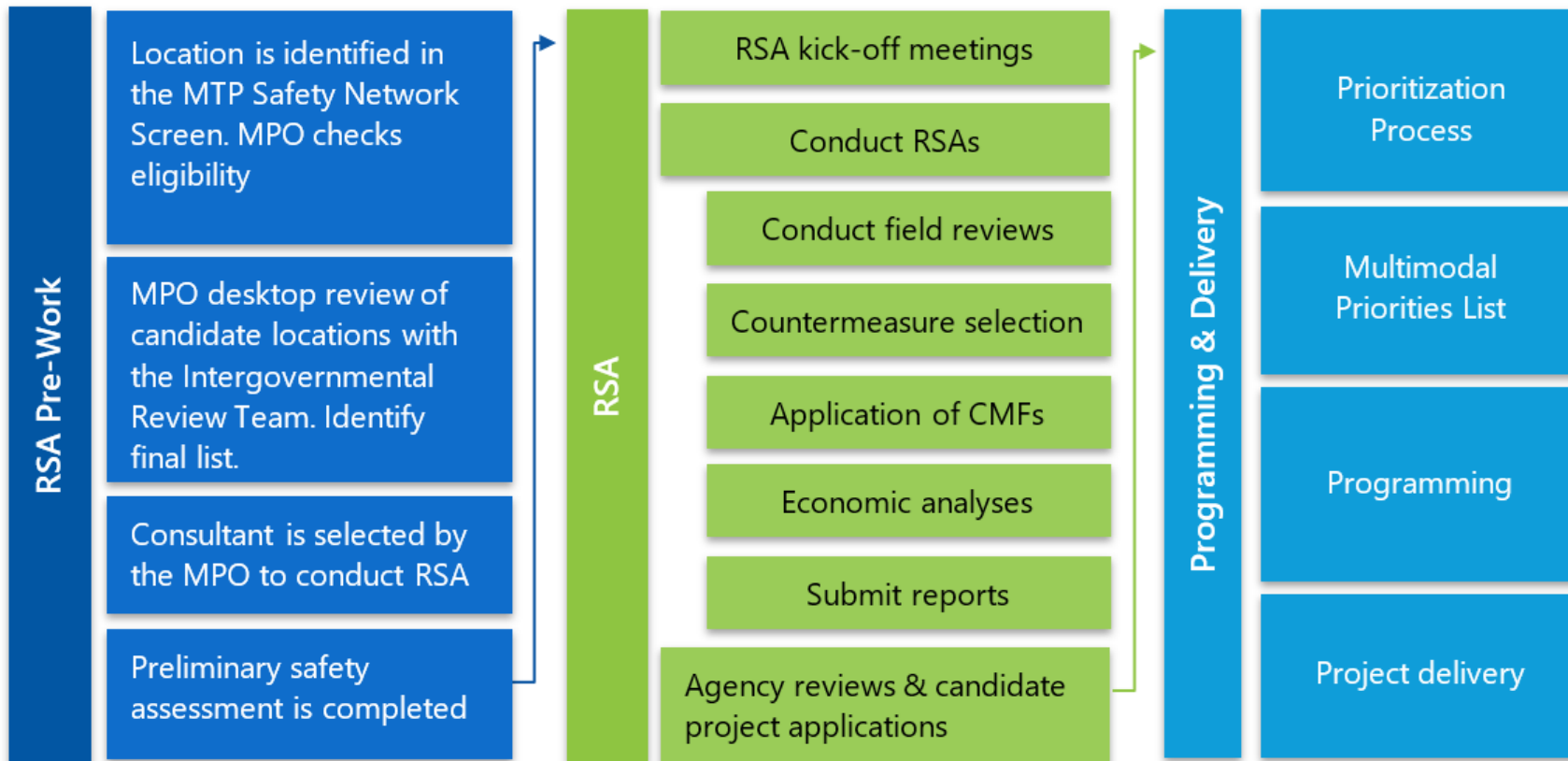
**Case Study:**  
**Intersection of University Drive and Royal  
Palm Boulevard Safety Improvement Concept**  
**Coral Springs, FL**

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## University Drive and Royal Palm Blvd. Intersection Case Study

- ❑ The Royal Palm Boulevard Roadway Safety Audit (University Dr. to Riverside Dr.) was completed by Broward MPO in 2022
- ❑ Corridor was identified in Broward MPO's 2045 MTP as a high crash area
- ❑ Part of Broward MPO's ongoing safety program whereby we develop RSAs, conceptual safety countermeasures and help guide projects through implementation

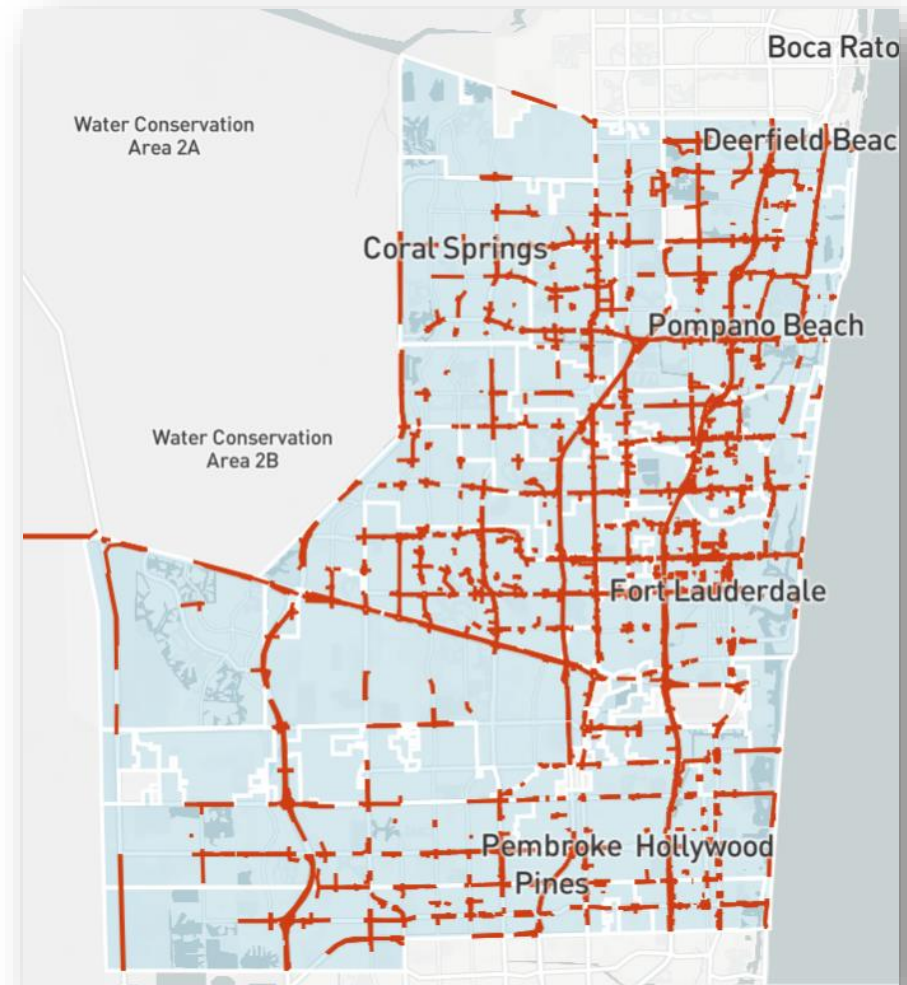
# Broward MPO's Safety Process



- Create an innovative, centralized, and equitable off-system safety study process
- Expedite the identification of crash hot spots and effective countermeasures on behalf of municipalities
- Create a conveyor belt of safety projects from concept to construction

# Why Are Arterial Intersections Important?

- ❑ 85% of all fatal and serious injury crashes in Broward County occur on 8.5% of street lane miles
- ❑ Of those 8.5% of lane miles, the vast majority are arterials and collectors (wide 6-8 lane streets)



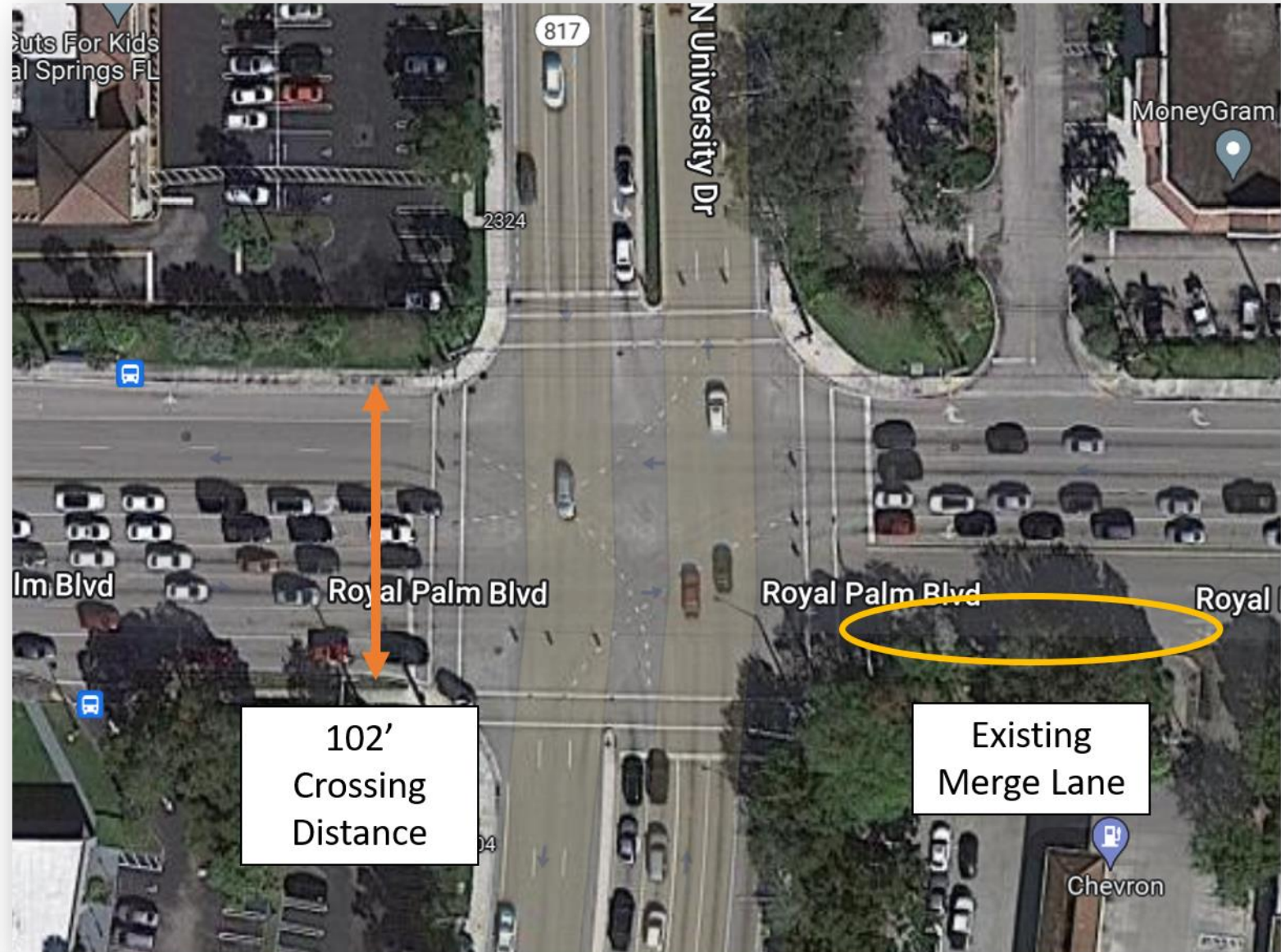
Broward County High Injury Network

# University Drive and Royal Palm Blvd. Intersection Case Study



This arterial intersection is a major crash hot spot within the study area with several pedestrian access and safety issues:

- Merge lane on eastern leg encouraged queue jumping and vehicle conflicts
- Poor crosswalk visibility
- Excessive roadway width and lack of pedestrian space
- Outdated signals with span wire infrastructure

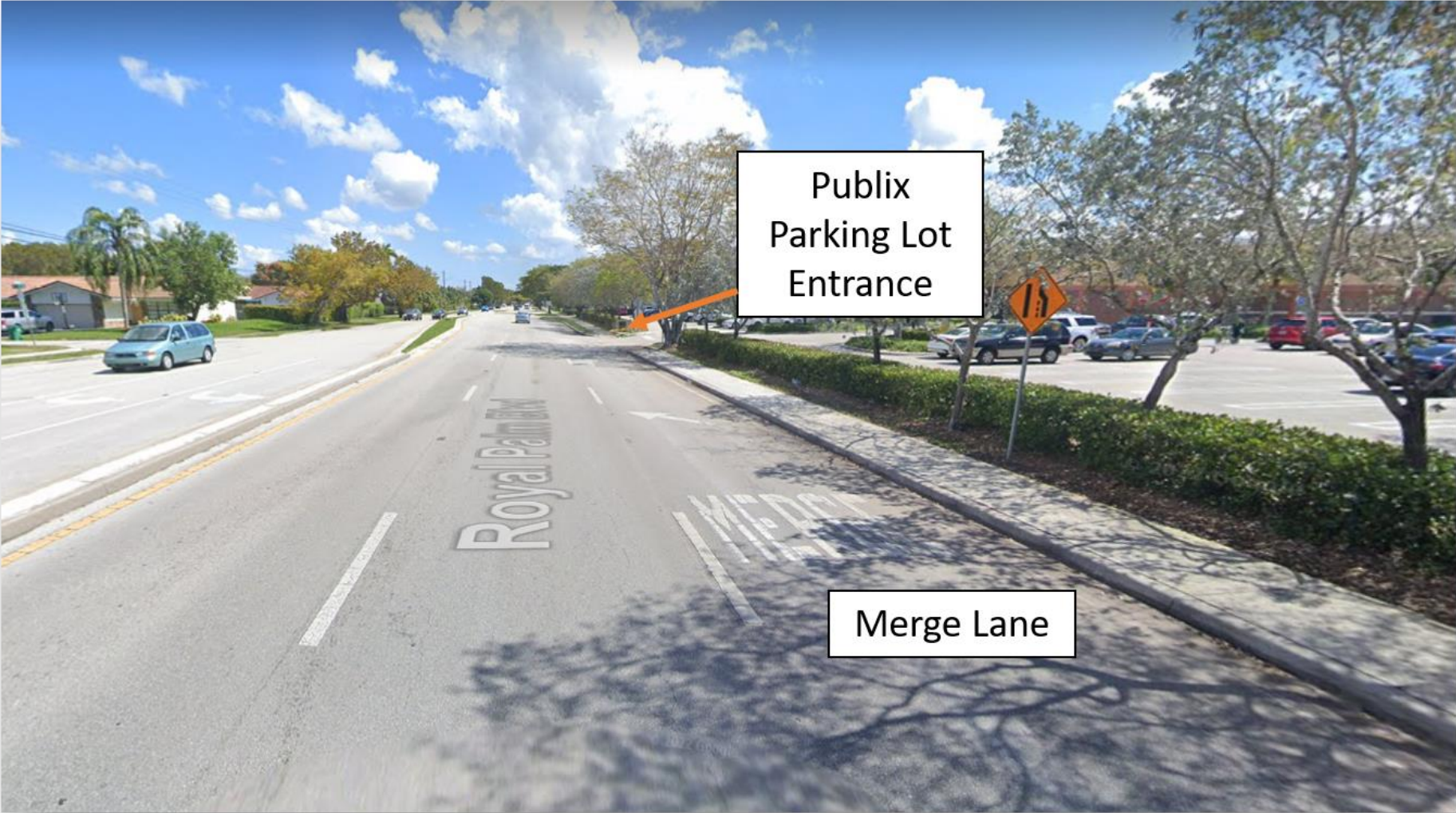




# University Drive and Royal Palm Blvd. Intersection Case Study



# University Drive and Royal Palm Blvd. Intersection Case Study



Publix  
Parking Lot  
Entrance

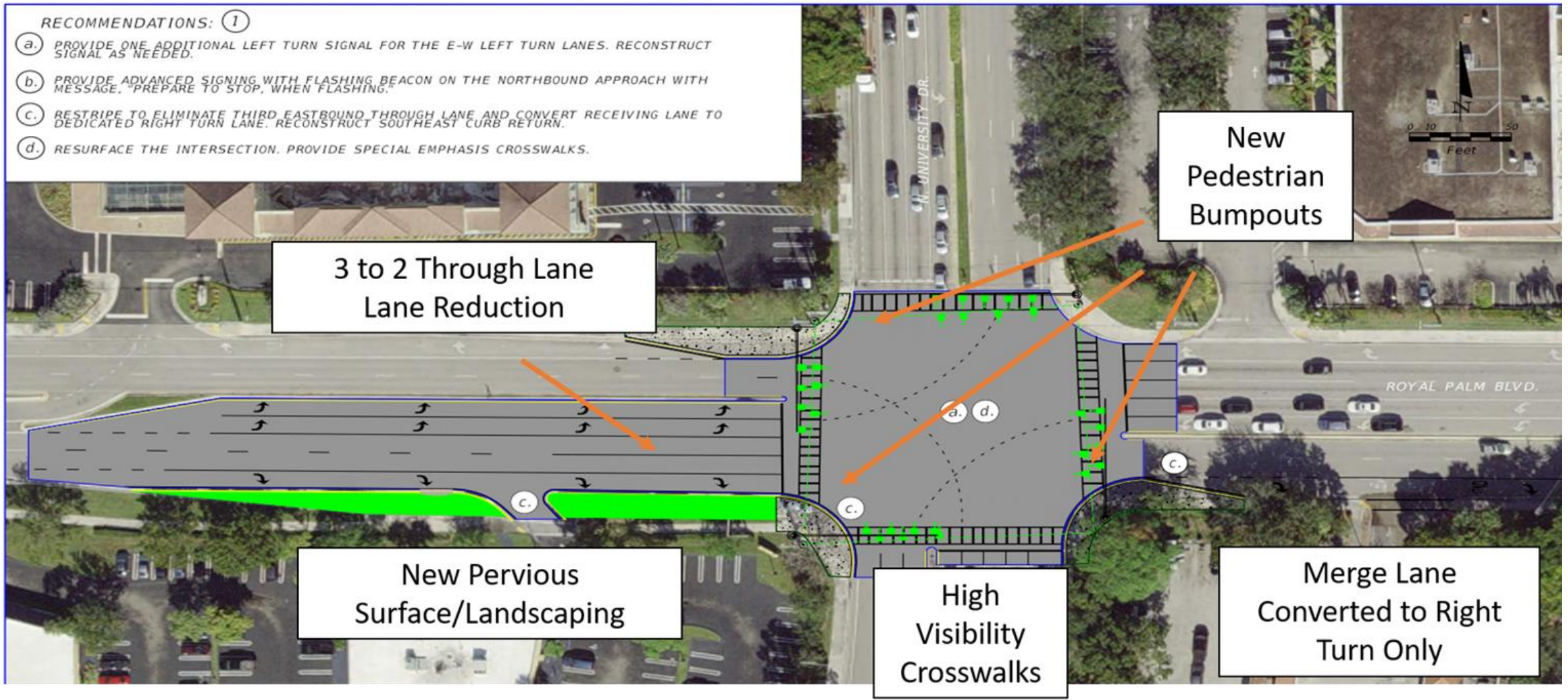
Merge Lane

## University Drive and Royal Palm Blvd. Intersection Case Study

Conceptual safety countermeasures included:

- Reduction from 3 to 2 EB through lanes on western leg
- Convert merge lane to right-turn-only lane into Publix parking lot to reduce vehicle conflicts
- Addition of new bumpouts on 3 of the 4 intersection corners
- New landscaping on western leg
- Additional signal heads, retro-reflective backing plates, mast arm signal upgrade
- High visibility crosswalks

# University Drive and Royal Palm Blvd. Intersection Case Study



# University Drive and Royal Palm Blvd. Intersection Case Study

## Barriers to Implementation

- Jurisdictional issues with several roadway owners throughout project area. Required extensive coordination.
- University Drive is a state roadway. FDOT policy does not allow for local or county governments to construct improvements on State right of way
- FDOT may include this safety concept in a future University Dr. traffic study

# University Drive and Royal Palm Blvd. Intersection Case Study

## Long Term Unresolved Design Issues

- Undesignated 4' wide buffer area on University Drive – is there a way to convert it into a safe bike facility and incorporate a protected bike intersection at University Dr. and Royal Palm Blvd?



Davis, CA Protected Bike Intersection

# Safer, Multimodal Protected Intersections



# The Case for Multimodal Design & Protected Intersections



*Palm Beach Post*



*Seton*



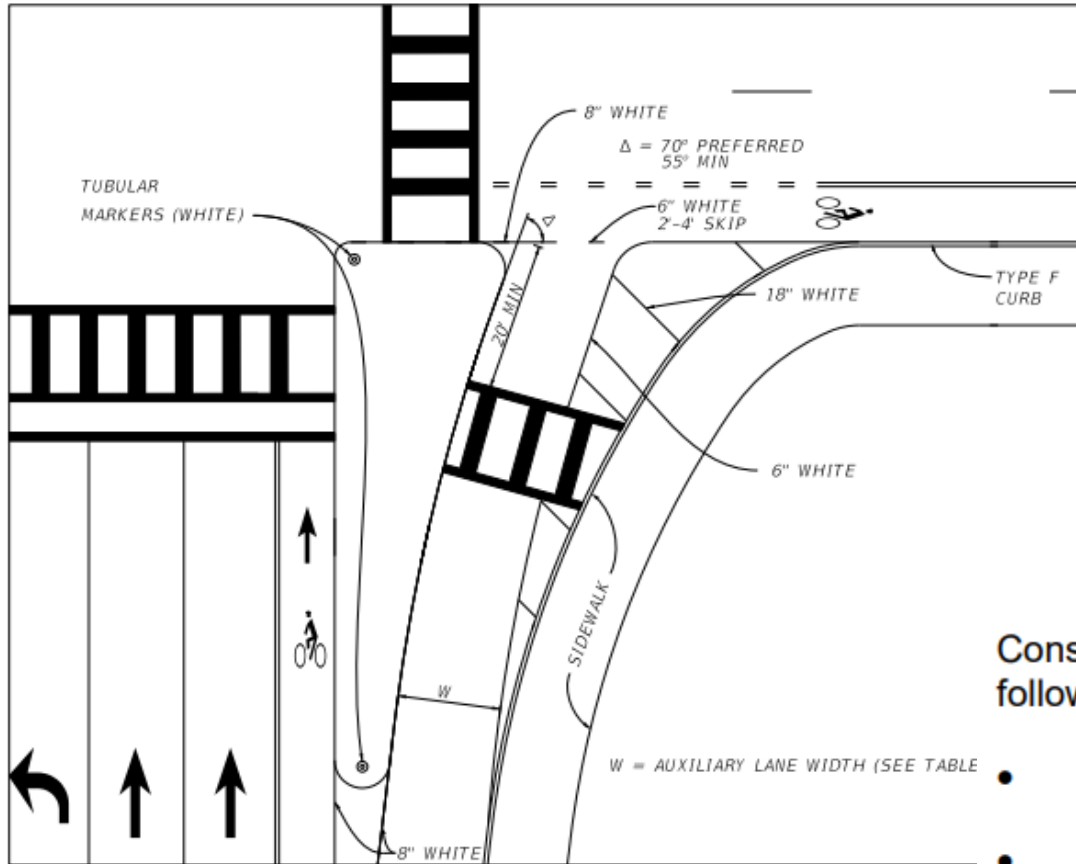
# The Case for Multimodal Design & Protected Intersections



*FDOT Context Classification*

# The Case for Multimodal Design & Protected Intersections

**Figure 212.12.4 Near Perpendicular Right Turn Lane**

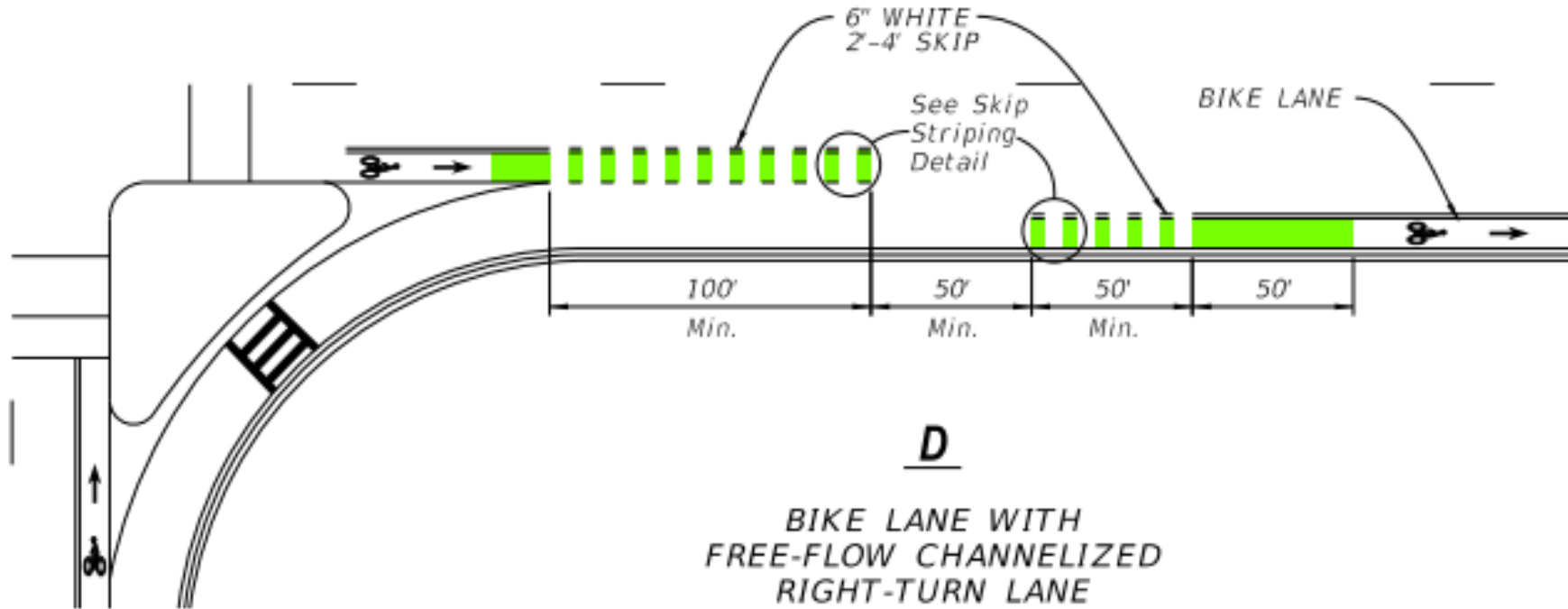


FDOT Design Manual, 212-Intersections

Consider the near perpendicular right turn lane design in **Figure 212.12.4** when the following conditions are met:

- Context Classification C2T, C3, C4, C5 and C6
- Low speed roadway (design speeds 45 mph and less)
- Pedestrian traffic is expected
- No acceleration lane is provided

# The Case for Multimodal Design & Protected Intersections



FDOT Design Manual, 223-Bicycle Facilities

# The Case for Multimodal Design & Protected Intersections



*Long Beach, CA*

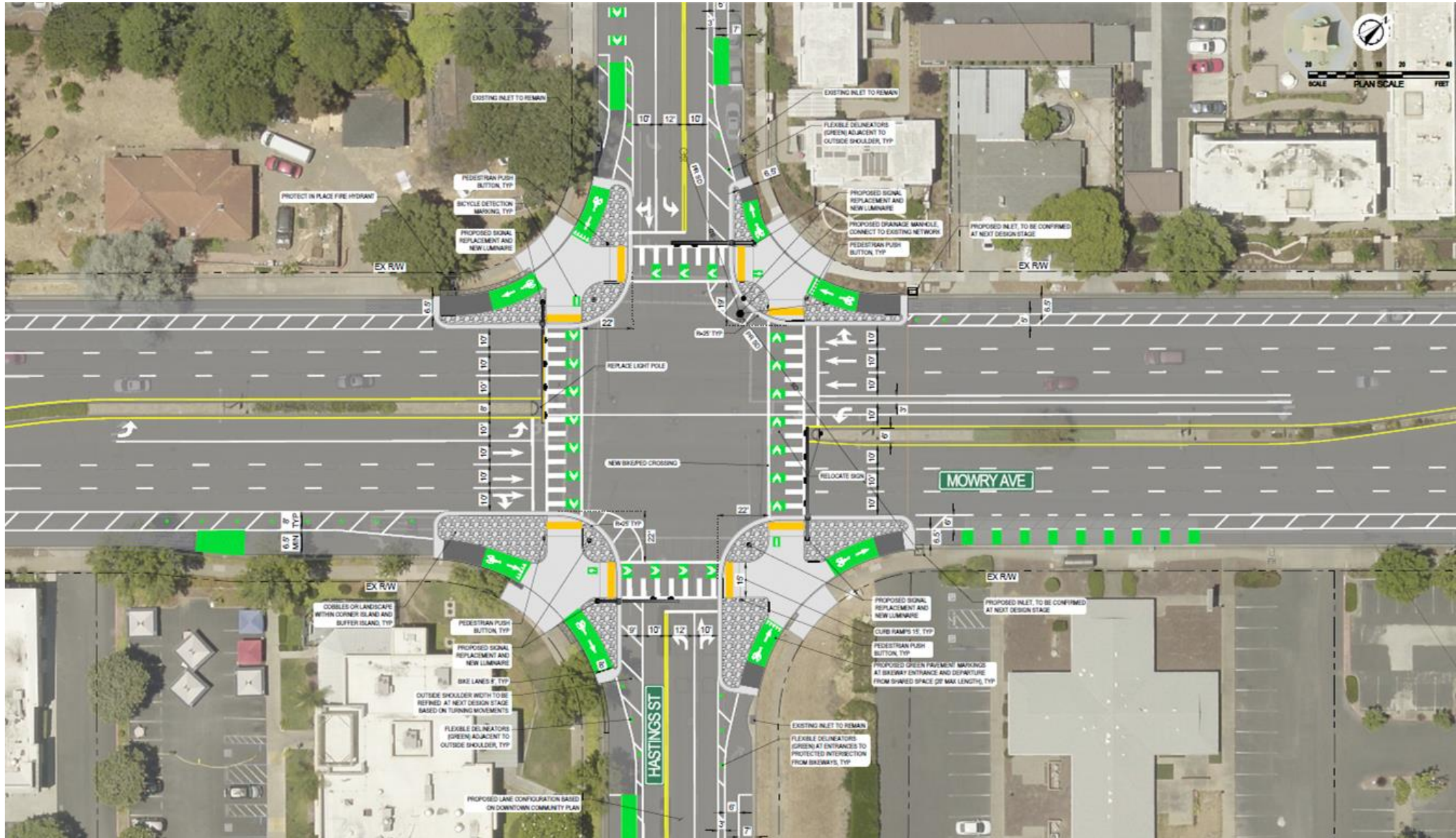


# Design Case Studies and Takeaways for Implementation

# Protected Intersection – Salt Lake City, UT



# Arterial Protected Intersection - Fremont, CA (#1)

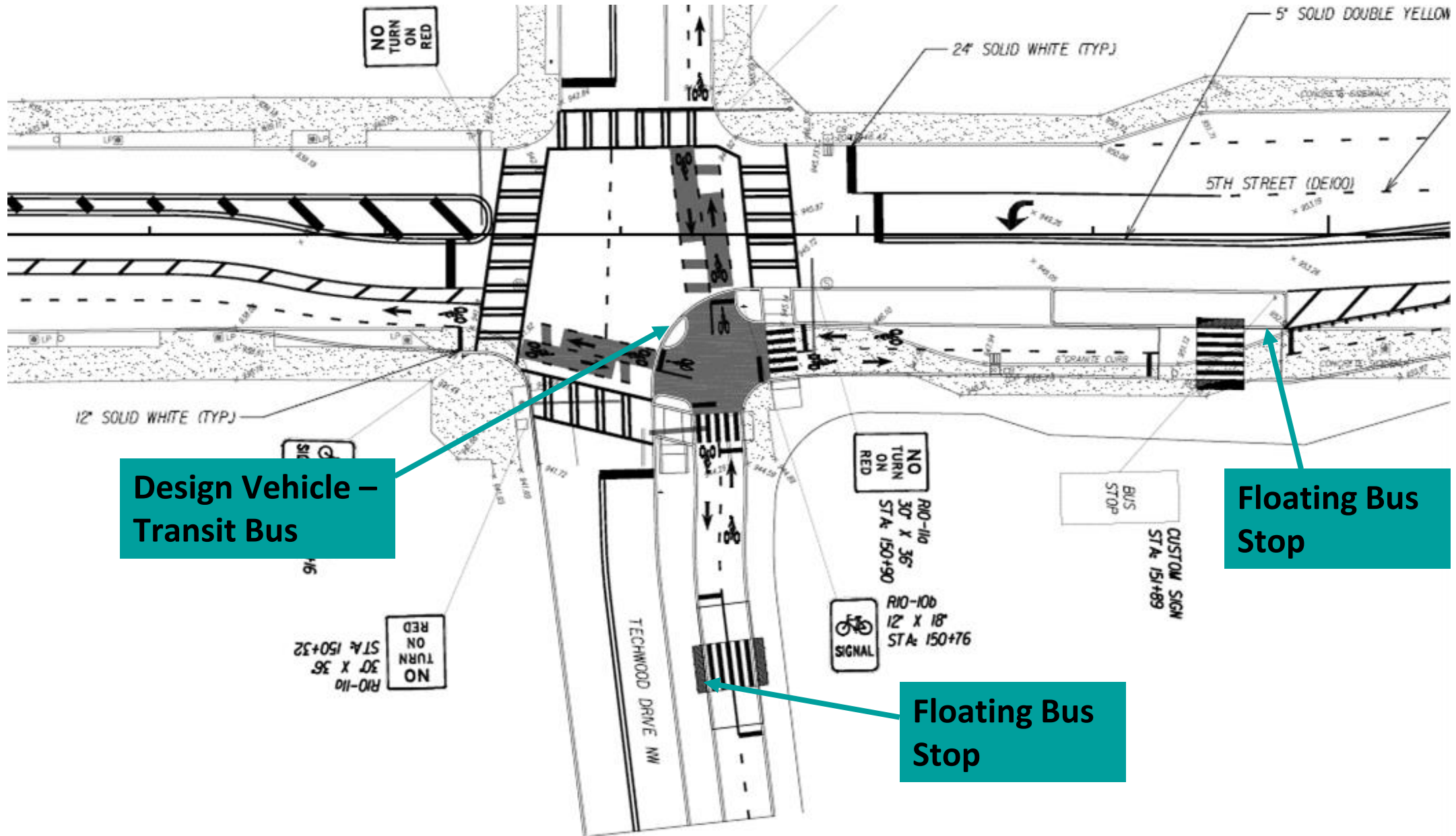








# Protected Intersection Adjacent to Transit Stops - Atlanta, GA

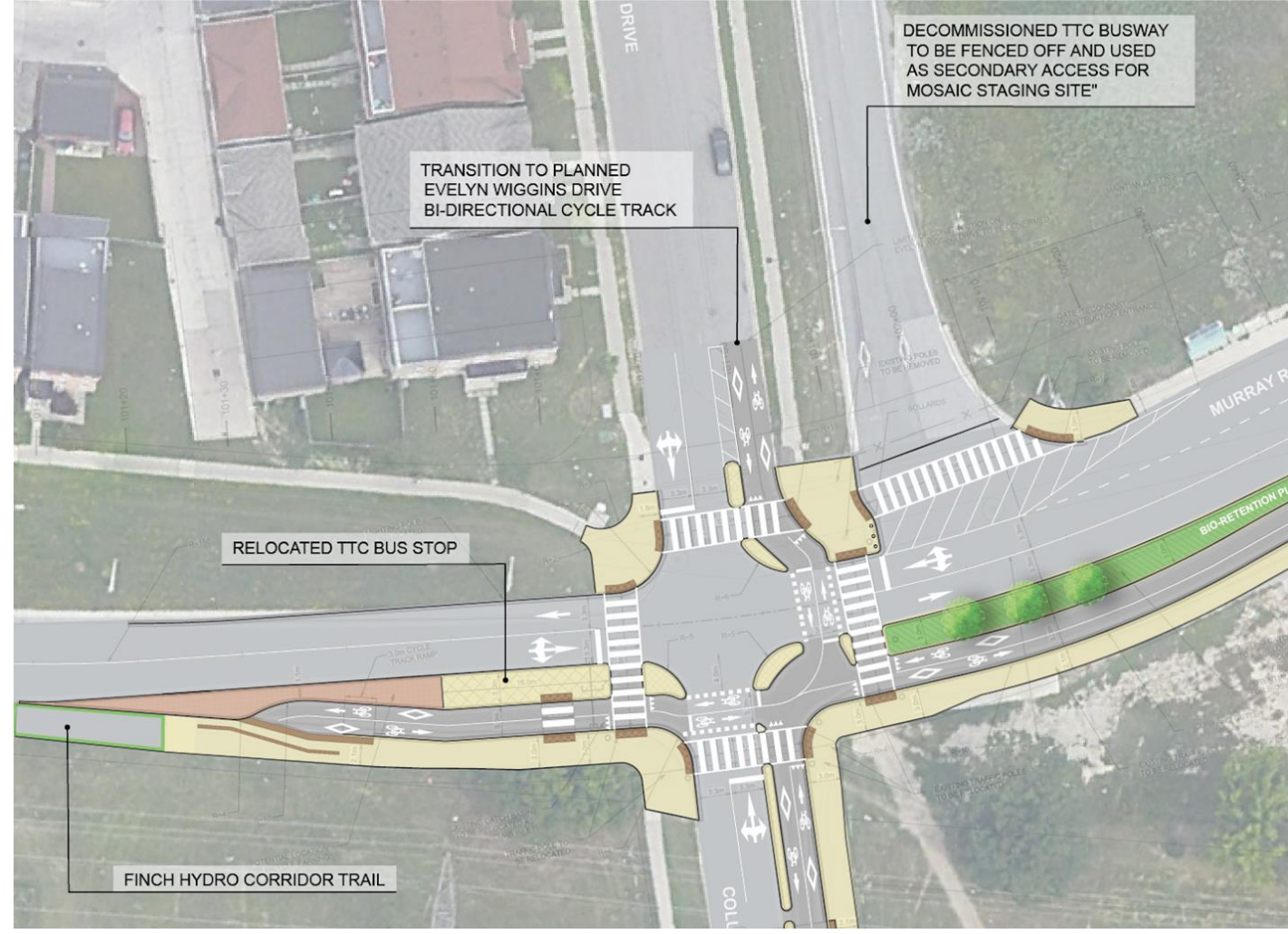


Design Vehicle –  
Transit Bus

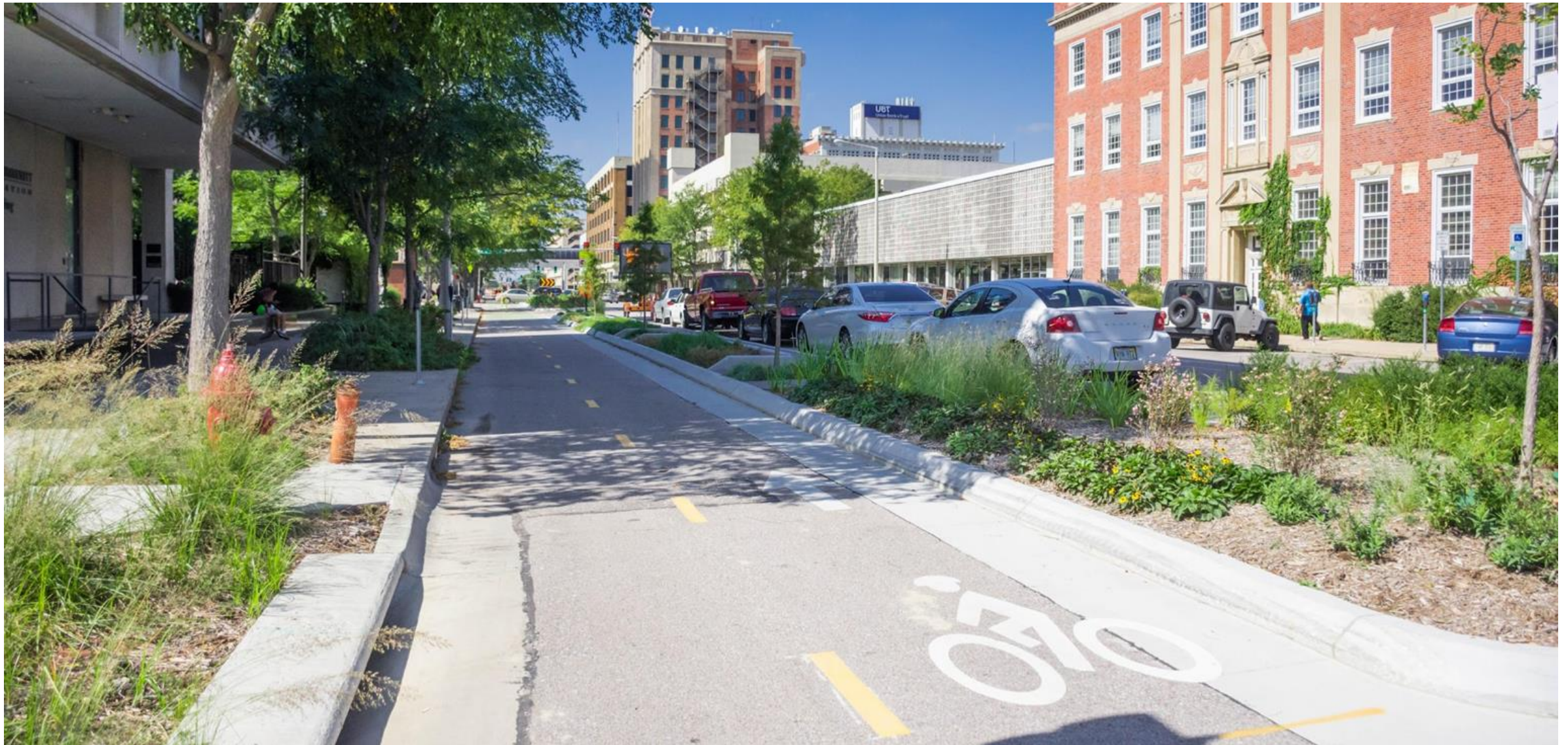
Floating Bus  
Stop

Floating Bus  
Stop

# Protected Intersection and Facility Transitions – York University – Toronto, ON



# Green Infrastructure and Resilience – N Street – Lincoln, NE

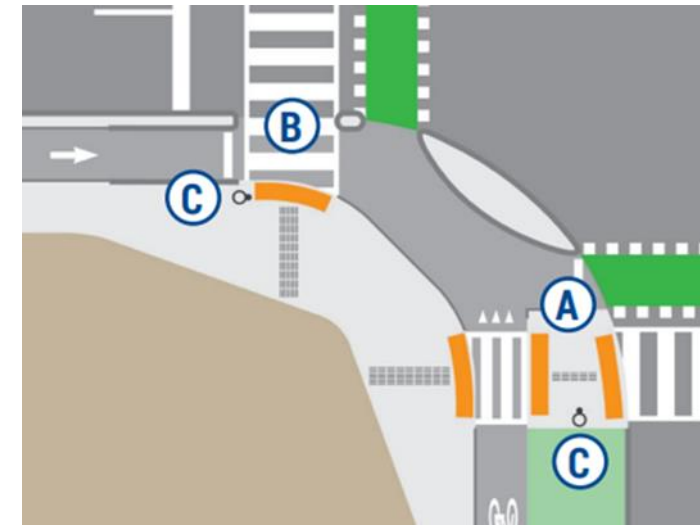


# Protected Intersection – Shared Use Path/Trail – Auburn, AL



# Evolution in Practices and Key Considerations

- **Bicycle and Pedestrian Delineation**
  - Exploration in use of color, pavement differentiation, tactile wayfinding tiles, optimizing details such as curb type and heights
- **Pedestrian Directness and Navigation**
  - Refuge areas, intuitiveness, direct paths of travel, universal design
- **Resilience, Urban Cooling and Shade**
  - How to incorporate green infrastructure, street trees, enhance landscape
- **Bicycle Capacity**
  - Using geometry to maximize storage potential, bike turning movements
- **Minimizing Corner Radius and Minimizing Impact of Large Vehicle Turns**
- **Signal Phasing and Geometry Work Together**



*Thank you!*