

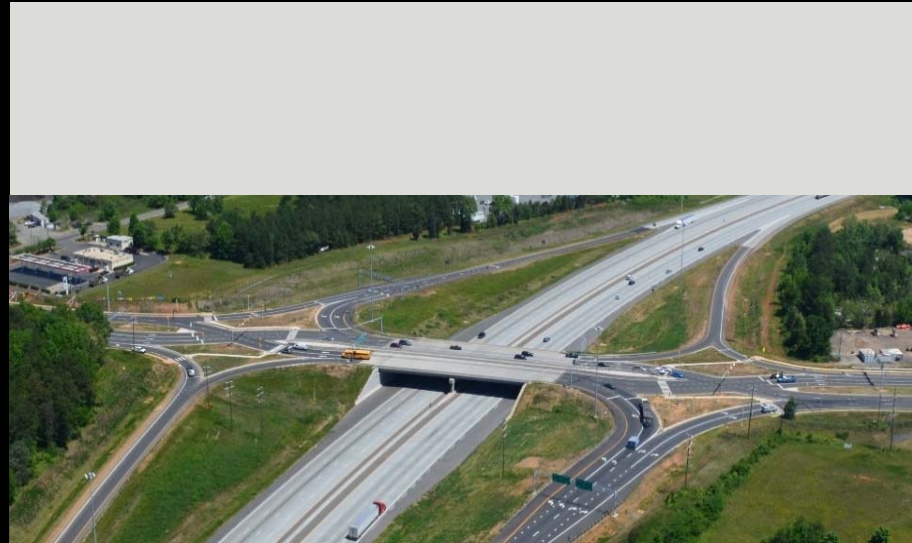


Frontage Roads and DDIs, An Atypical Pairing
May 21-24, 2017

5th Urban Street Symposium, Raleigh, NC

Outline

- Introduction
 - Benefits of DDIs
 - Benefits of Frontage Roads
 - We have a conflict . . .
- Conflict Remedies
 - Grade Separations
 - Embedded Intersections
 - Other DDI and Frontage Road Remedies
- Findings



Benefits of DDIs

- Fewer number of conflict points
- 2 phase signals
- Free Left Turns
- Increased Safety
- Cost effective for retrofitting projects
- Flexible geometry



What makes frontage roads successful

- Increases highway capacity
- Relieves local traffic pressure on mainline
- Route redundancy for mainline
- Allows for property access along access control frontage
 - Greater opportunity for economic development
 - Reduces new ROW acquisitions for new freeways
- Safety Benefits
- One-way and two way frontage roads



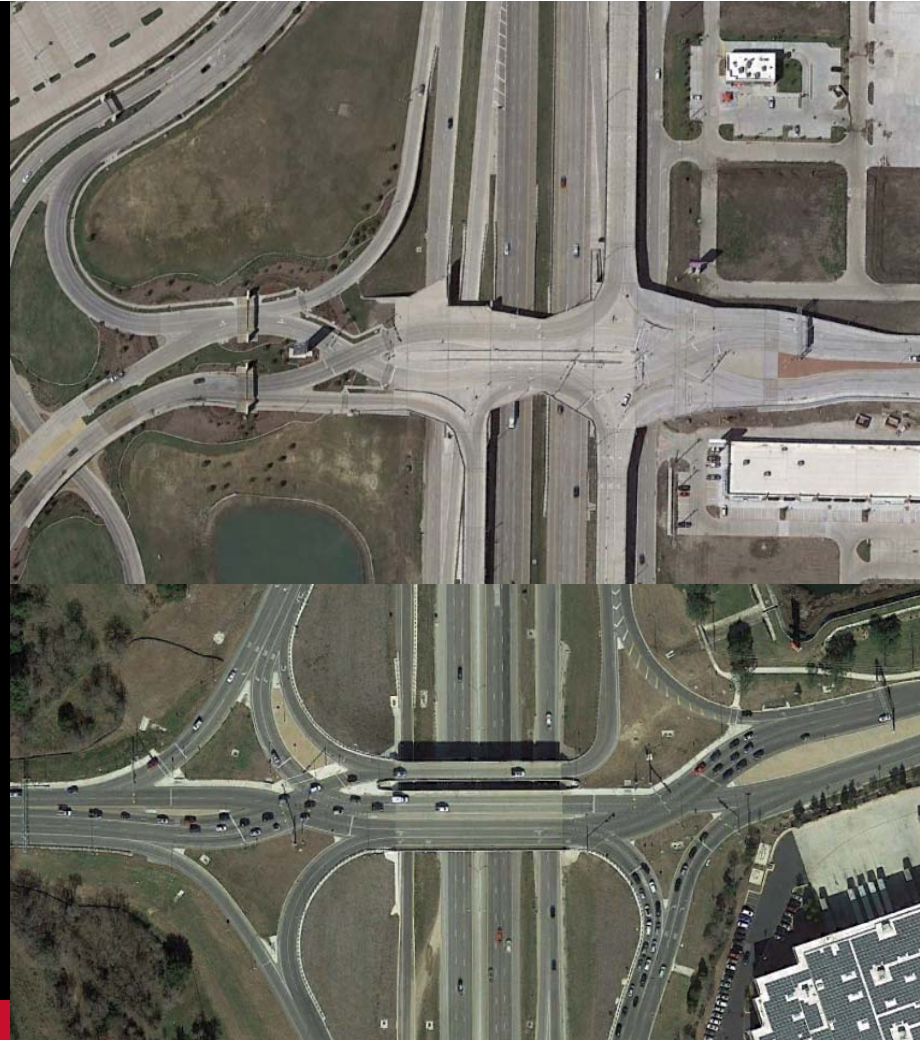
We have a conflict . . .

- Given:
 - Frontage Roads are a common existing condition
 - DDIs are becoming mainstream
- Problem Statement:
 - Conventional DDIs do not provide for a frontage road through movement
- Solution
 - ???



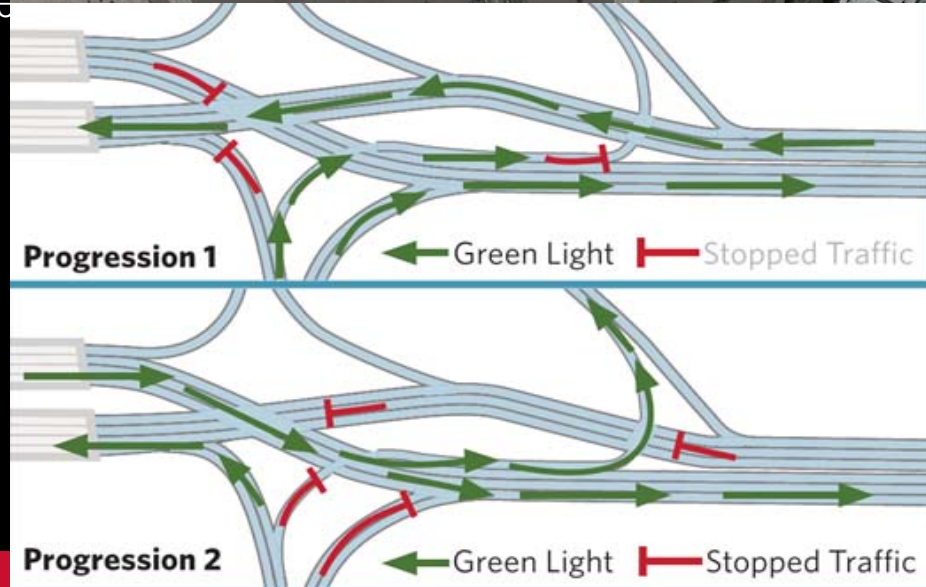
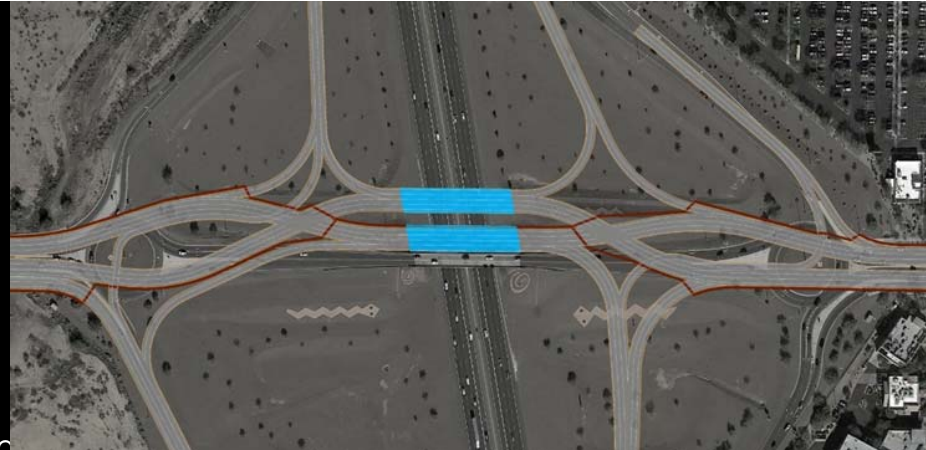
Grade Separations

- Case Studies
 - Sam Rayburn Tollway and South Colony Blvd (The Colony, Texas)
 - FM 1431 and IH 35 (Round Rock, Texas)
- Removes the conflict between the through movement and interchange traffic
- Requires additional structure area
- DDIs can easily accommodate frontage road "U-turns" (Texas U-turns)
- Alternative grade separation – frontage road flyover



Embedded Intersection

- Case Study
 - I-17 / Happy Valley Rd (Phoenix, Arizona)
- Offset approaching and departing frontage road termini
- Signals for embedded intersection are 2-phase and coordinated with DDI crossover signal



Other DDI / Frontage Road Remedies

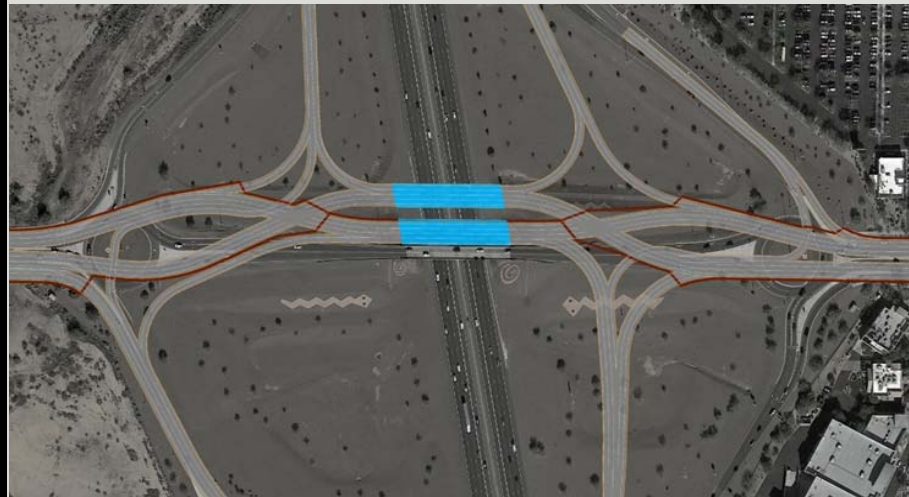
- Michigan Lefts
- Roundabout crossovers
- Traditional 3-phase intersections
 - U-turn
 - Offset the frontage roads to have a separate intersection



Source: TME Sprint 2014 Issue, Fingers Crossed by Ryan Hale

FINDINGS

- DDIs and Frontage Roads are compatible!
- Remember your Y-axis
- Utilize the DDI's curvature to your advantage
- Space helps
- Check the Frontage Road through volumes



QUESTIONS AND ANSWERS



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