



STIP No. U-4714

East John Street/Old Monroe Road Improvements

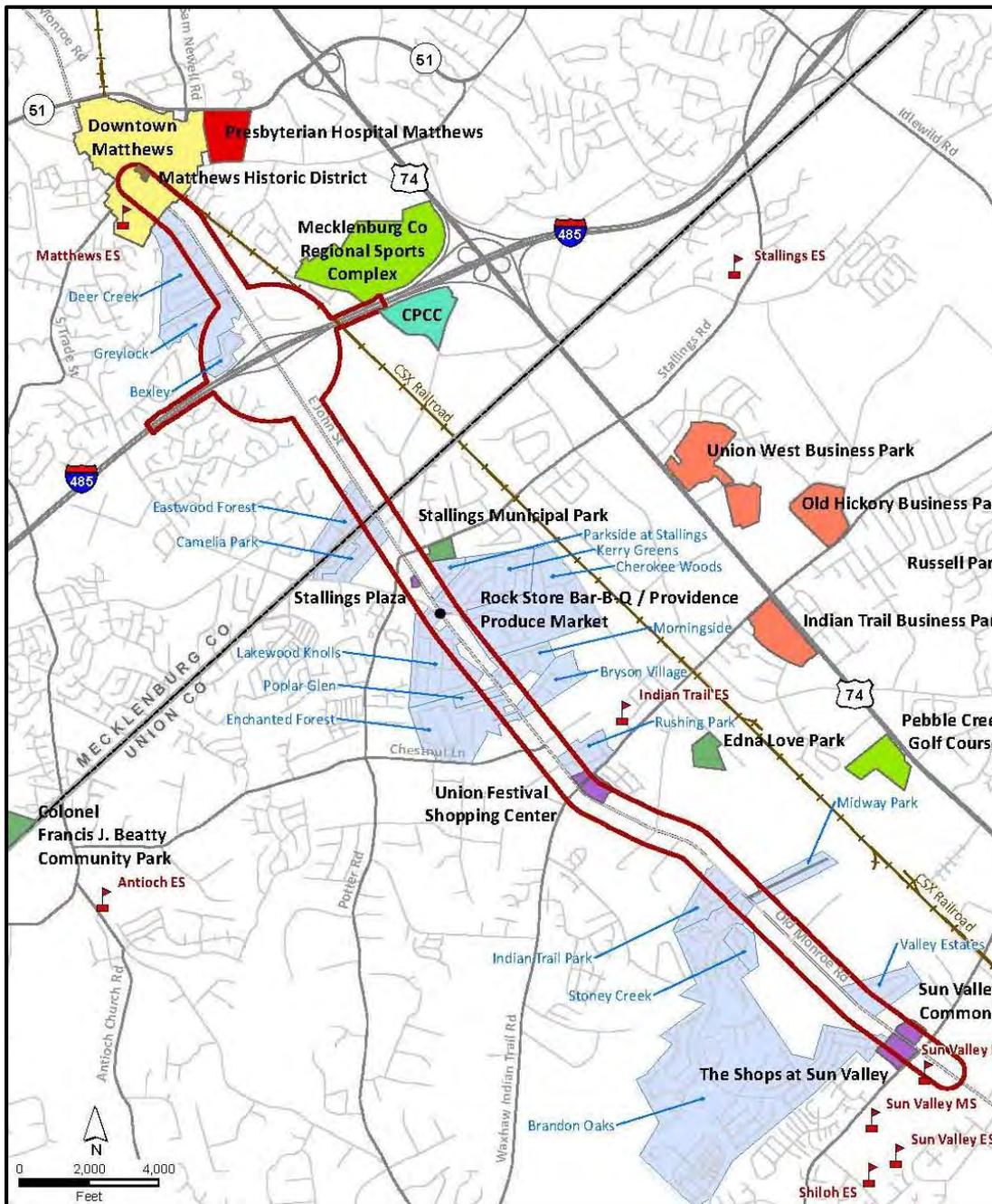
*Elected Officials Briefing
Town of Matthews*



Project Overview



Project Setting



- Traverses Matthews, Stallings, and Indian Trail
- Commuter (and Local) Route
- Notable traffic generators



2013 Traffic Volumes

Segment	Length (miles)	2013 Existing AADT
Trade Street to I-485	1.20	22,600
I-485 to Stallings Road	1.37	27,000
Stallings Road to Chestnut Lane	1.30	15,200
Chestnut Lane to Waxhaw-Indian Trail Road	0.30	20,800
Waxhaw-Indian Trail Road to Midway Road	1.12	22,400
Midway Road to Wesley Chapel-Stouts Road	1.27	17,200



Project Funding and Approval

The project will receive funding from the Federal Highway Administration (FHWA), and is being administered through the NC Dept. of Transportation (NCDOT).

A condition of this federal funding is compliance with the National Environmental Policy Act. To do this, an Environmental Assessment is being prepared.



Environmental Assessment/FONSI

- Formal scoping process and public involvement
- Evaluates one or more Build alternatives and the No-Build (do nothing) alternative
- Determines if proposed action may result in “significant” environmental impacts
- EA made available for public review and a public hearing held



Major Parts of an EA

NEPA-Speak

1. Purpose and Need
2. Alternatives Evaluation
3. Affected Environment and Environmental Consequences (good and bad)
4. Mitigation
5. Public/Agency Involvement

Plain English

1. What's the problem?
2. Ways to solve problem
3. Pros and cons of each solution
4. Ways to lessen impacts
5. What have people said about it?



Where Have We Been?

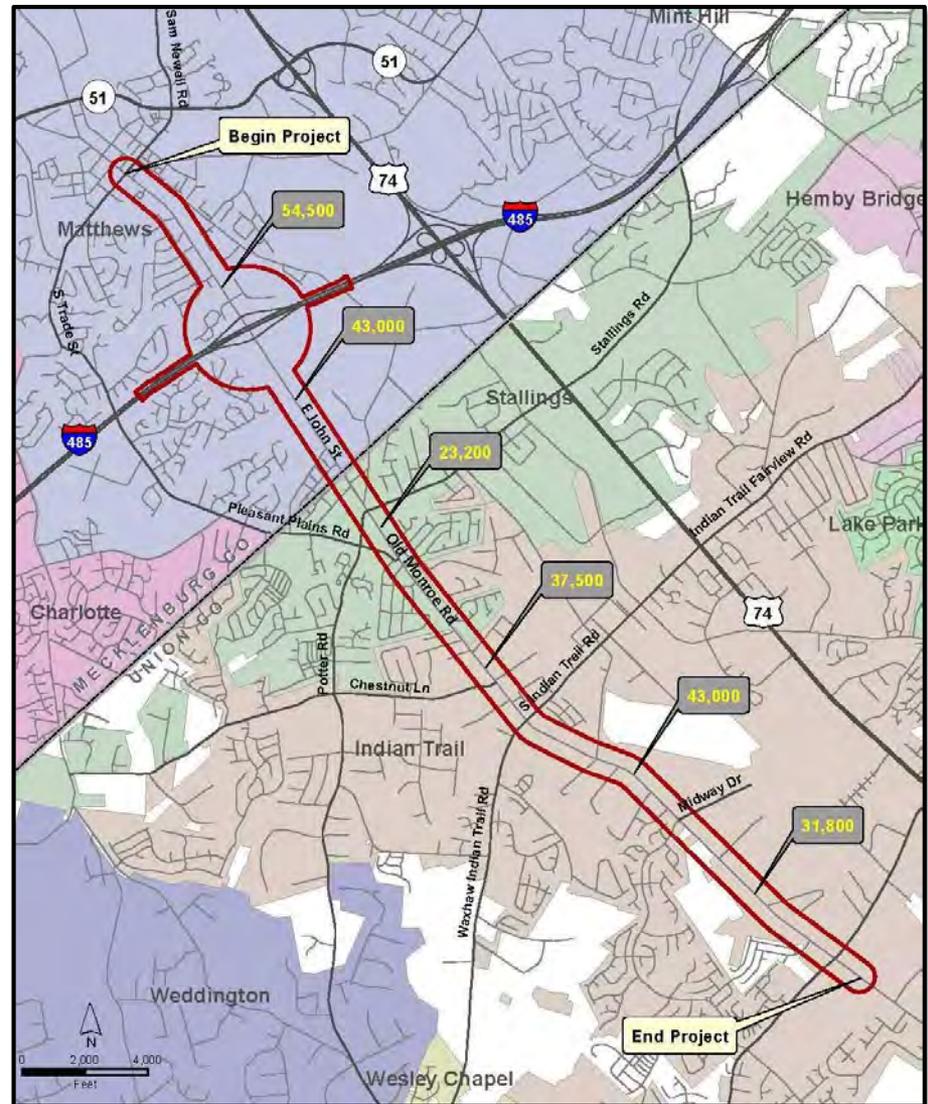
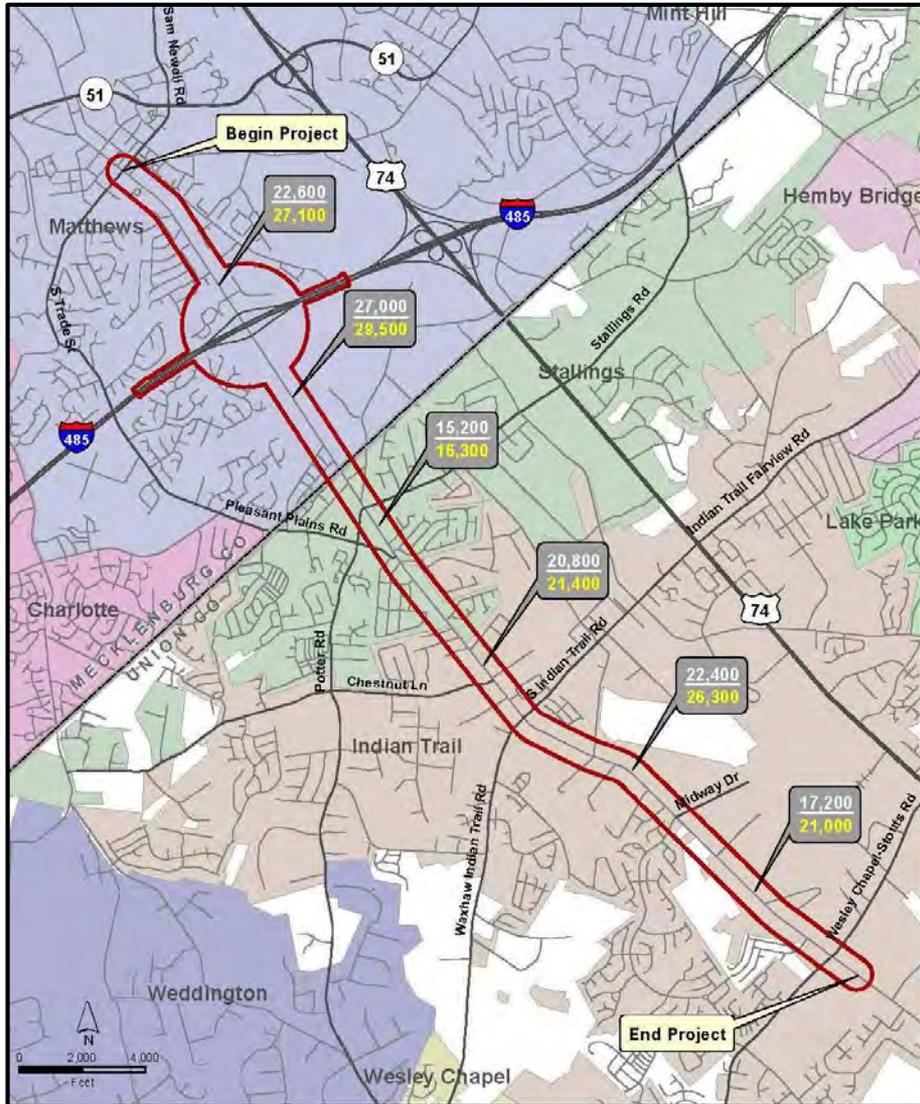


Where have we been...?

- Purpose and Need statement
- Alternatives Identification and Analysis
- Other supporting tech studies
 - Historic Surveys
 - Traffic Analysis (extensive)
 - Etc.
- Public Involvement



Project Need



Project Purpose

- Address capacity deficiencies
- Enhance mobility for traffic, pedestrians and bicyclists along the corridor
- Enhance overall travel safety for all users in the project study area



Other Project Goals

- Consensus on design features
- Aesthetics considerations
- Multi-modal
- Access management

What is a Complete Street?

Complete streets are streets for everyone. They are designed to enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all abilities. There is no singular design prescription for Complete Streets; each one is unique and responds to its community context. Complete Streets can include features such as sidewalks, bike lanes (or wide paved shoulders), multi-use paths, frequent and safe crossing opportunities, median islands, lighting, and landscaping/planters.



Alternatives Development

- Identify and evaluate alternative ways to meet the purpose and need of the proposed action
- Reasonable range of alternatives
- Example
 - Type of facility (divided, undivided)
 - Capacity (# of lanes)
 - Design features (cross section)



Challenges for STIP No. U-4714

- Impacts to residents and businesses
- Archaeological/historic resources – potential
- Churches – five along project alignment
- Four Mile Creek Greenway & Future



Challenges for STIP No. U-4714

- Landowners
- Utilities
- Growth near I-485
- Access – Business, fire station, neighborhoods



Alternatives Development

IMPROVE EXISTING ROADWAY

The following range of roadway and intersection options were developed in collaboration with the public and local officials.

Roadway Options

varying bike/ped accommodations

- 4 lanes/divided
- 4 lanes/undivided
- 6 lanes/divided
- 5 lanes

Intersection Options

- Traditional signalized
- Superstreet
- Michigan left
- Roundabout
- Quadrant
- Interchange forms for I-485

Screening Analysis

Options screened for ability to meet purpose and need, public/agency opinion, and issues that would render an option unreasonable or infeasible.

- **Preliminary Alternative 1** - 4-lane divided with traditional signalized intersections
- **Preliminary Alternative 2** - 6-lane divided with traditional signalized intersections
- **Preliminary Alternative 3** - 4-lane divided Superstreet

Comparison of Preliminary Alternatives
Preliminary alternatives compared for traffic operations, qualitative impacts, and public/agency opinion.

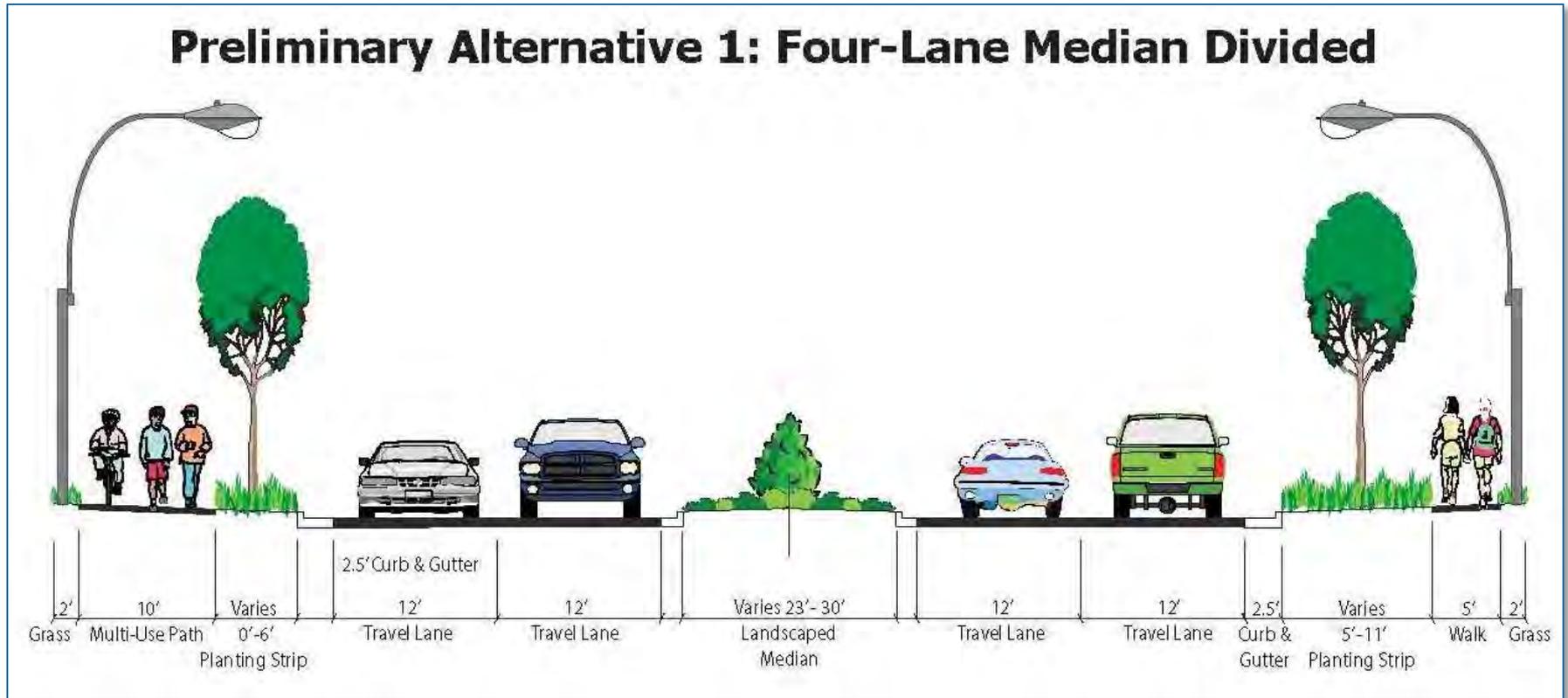


Alternatives Development

E. JOHN ST. / OLD MONROE RD.		PRELIMINARY ALT 1: 4-LANE DIVIDED	PRELIMINARY ALT 2: 6-LANE DIVIDED	PRELIMINARY ALT 3: 4-LANE SUPERSTREET
TRADE ST.	●	Traditional signalized	Traditional signalized	Traditional signalized
		4-lane divided	6-lane divided	4-lane divided
GREYLOCK RIDGE RD./ SPORTSPLEX (FUTURE)	●	Traditional signalized	Traditional signalized	Superstreet
		4-lane divided	6-lane divided	4-lane divided
I-485 INTERCHANGE RAMP (*Evaluated Partial Cloverleaf interchange design for all Preliminary Alternatives)	●	*Traditional signalized	*Traditional signalized	*Traditional signalized
		4-lane divided	6-lane divided	4-lane divided
McKEE RD. EXT (FUTURE)	●	Traditional signalized	Traditional signalized	Superstreet
		4-lane divided	6-lane divided	4-lane divided
STALLINGS RD/POTTER RD.	●	Traditional signalized	Traditional signalized	Superstreet
		4-lane divided	6-lane divided	4-lane divided
PLEASANT PLAINS RD. (*Also evaluated full intersection realignment with Kerry Greens entrance for 4-lane and 6-lane)	●	*Traditional signalized	*Traditional signalized	Superstreet
		4-lane divided	6-lane divided	4-lane divided
CHESTNUT CONNECTOR (FUTURE)	●	Traditional signalized	Traditional signalized	Superstreet
		4-lane divided	6-lane divided	4-lane divided
WAXHAW-INDIAN TRAIL RD.	●	Traditional signalized	Traditional signalized	Superstreet
		4-lane divided	6-lane divided	4-lane divided
BRANDON OAKS PKWY.	●	Traditional signalized	Traditional signalized	Superstreet
		4-lane divided	6-lane divided	4-lane divided
MUSTANG DR.	●	Traditional signalized	Traditional signalized	Superstreet
		4-lane divided	6-lane divided	4-lane divided
WESLEY CHAPEL-STOUTS RD.	●	Traditional signalized	Traditional signalized	Michigan left
		4-lane divided	6-lane divided	4-lane divided
SUN VALLEY HIGH SCHOOL ENTRANCE	●	Traditional signalized	Traditional signalized	Superstreet



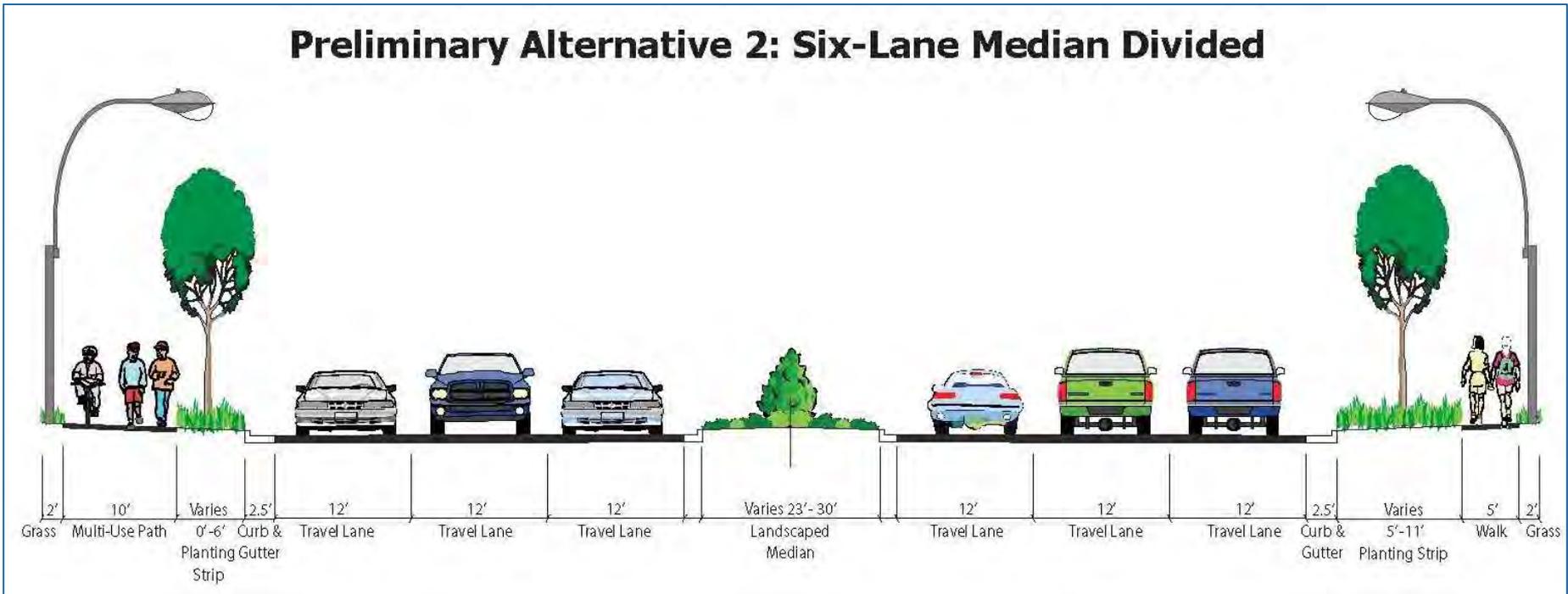
Preliminary Alternative 1 (4-Lane Median Divided with Conventional Intersections)



Preliminary Alternative 2

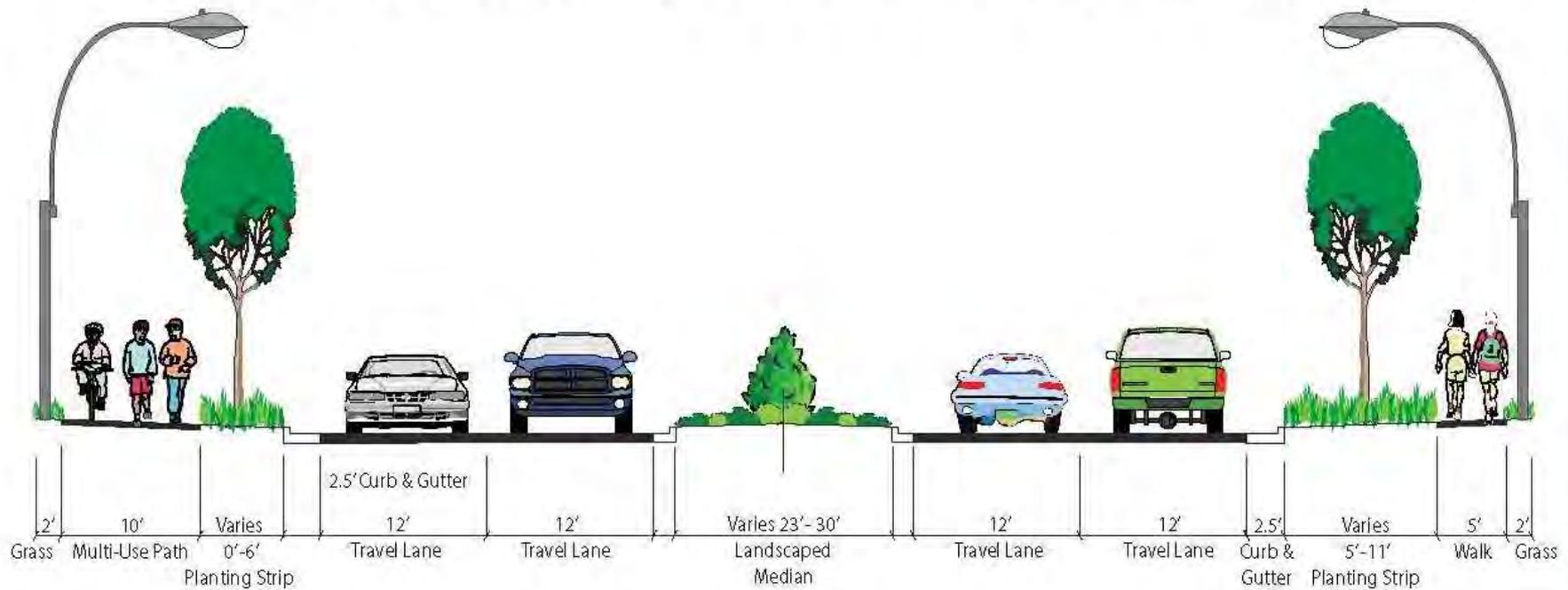
(6-Lane Median Divided with Conventional Intersections)

Preliminary Alternative 2: Six-Lane Median Divided

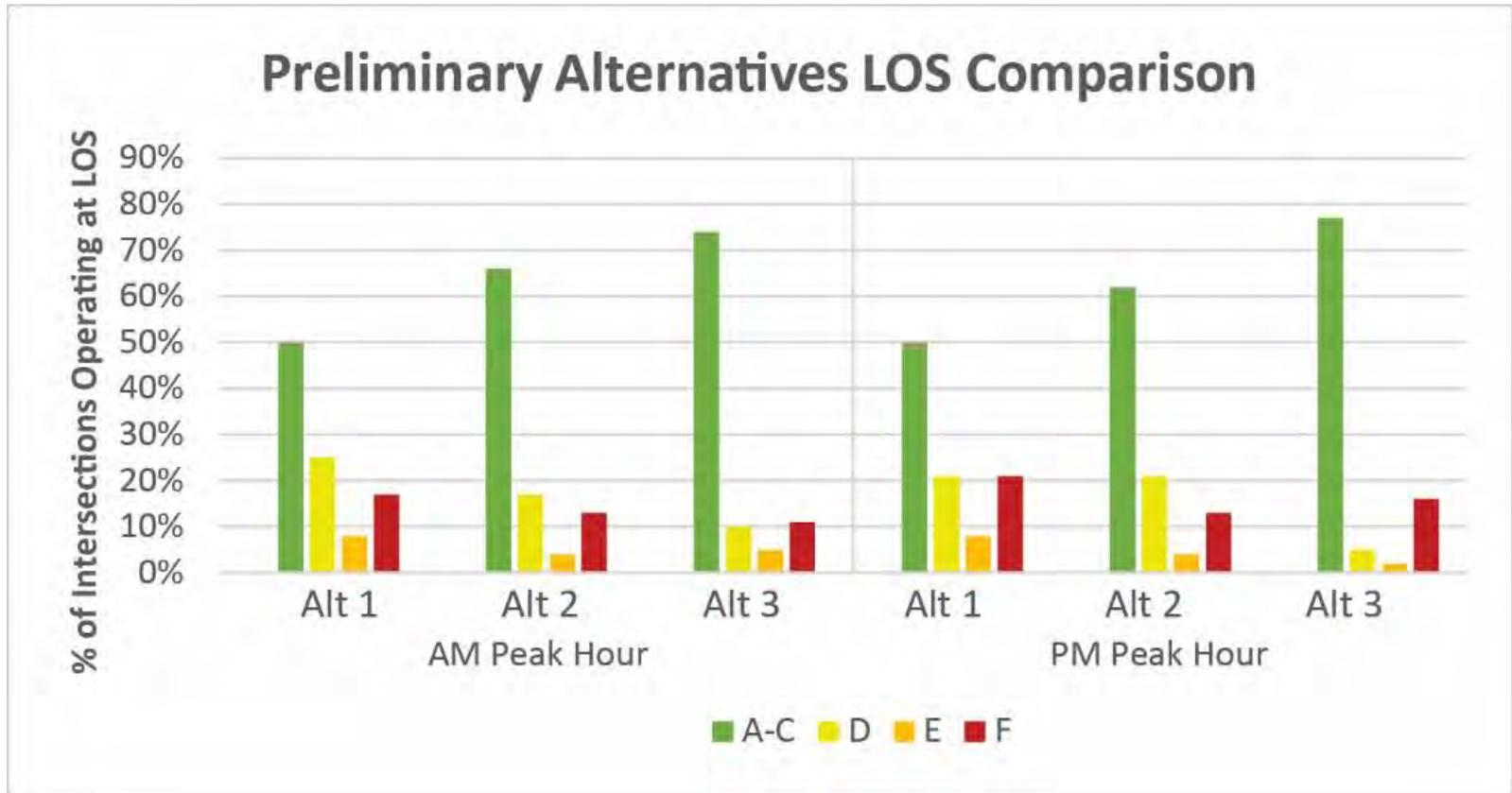


Preliminary Alternative 3 (4-Lane Median Divided with Superstreet Intersections)

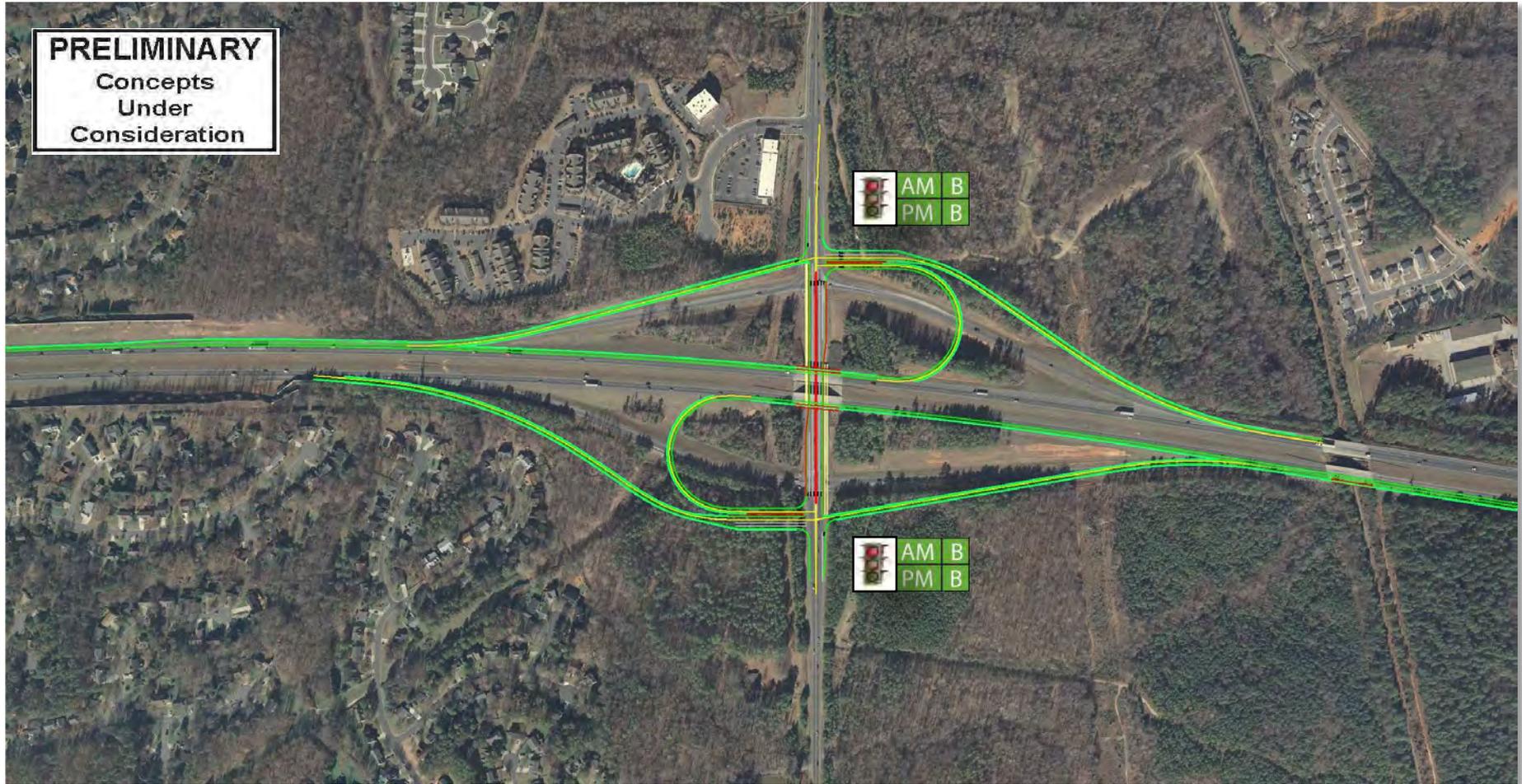
Preliminary Alternative 1: Four-Lane Median Divided



Preliminary Alternatives – Traffic Operations



East John Street/I-485 Interchange Partial Clover A



Public Involvement

- Three-Day Design Charrette (August 2013)
- Public Meeting (January 2014)
- Small Group Meetings (As Requested)
 - HOAs
 - Arista Development (Indian Trail)
 - Other property owners
- Local Coordination (Matthews Staff, TAC, Council, Planning Board)



Design Charrette

- Brought together stakeholders
- Community-led input to alternatives
 - How should it look?
 - How should it function?
- Bicycle/pedestrian preferences
- Prospect for consensus
- Which concepts likely to face strong opposition and likely favored to move into detailed study



Roadway Options



Bicycle and Pedestrian Options

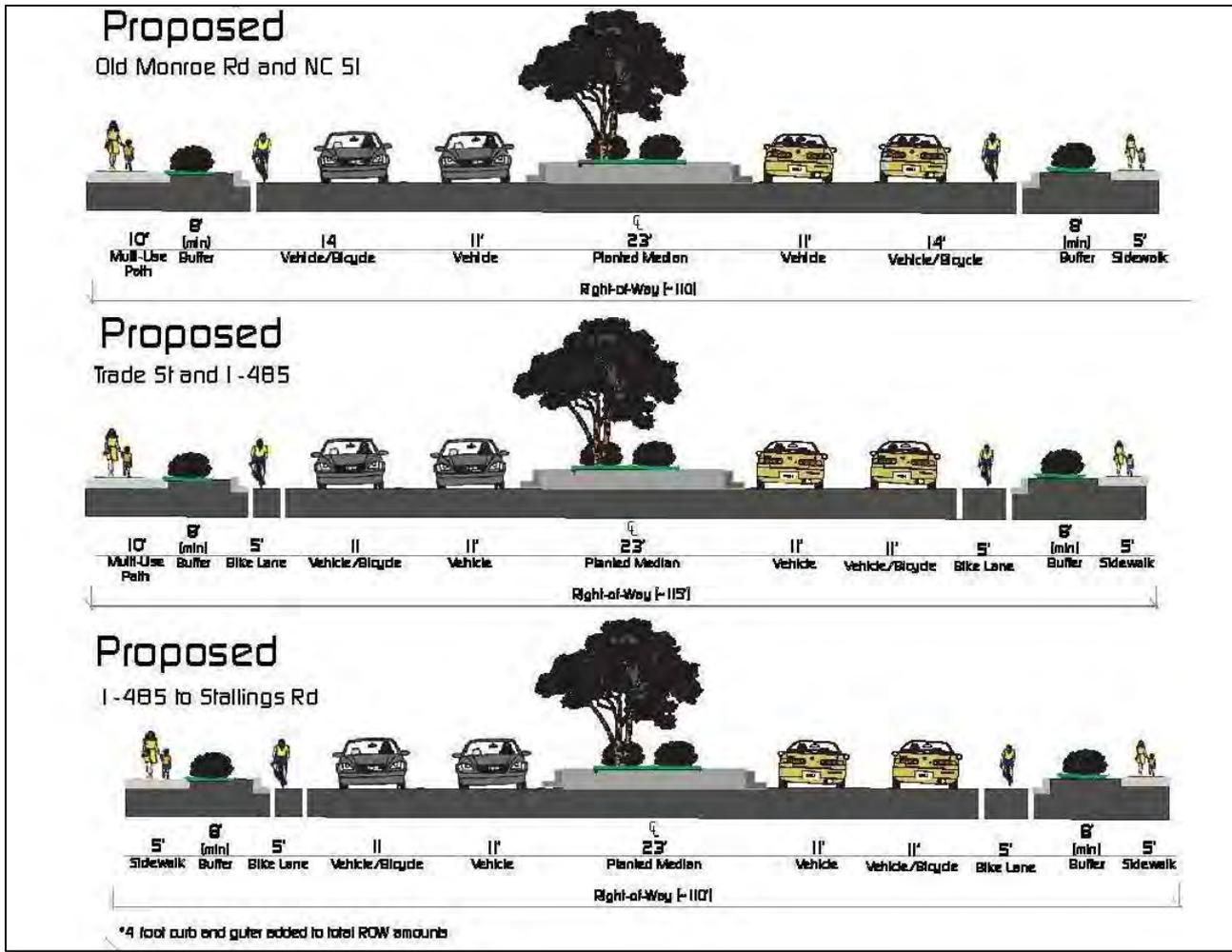


Local Coordination (Matthews)

- Project Symposium (All Towns) - May 8, 2013
- Quarterly (All Towns) - Spring 2013-Fall 2014
- January 13, 2014
- June 9, 2014
- September 8, 2014
- September 16, 2014
- March 13, 2015 (*Preview of Preliminary Design at Quarterly Meeting)
- October 6, 2015 (Matthews Staff/Property Owner)
- February 8, 2016



Matthews Comprehensive Transportation Plan



Preliminary Alternative 2 (6-Lane Median Divided) Dropped...

- Provides only marginal operational benefits over 4-Lane Divided and 4-Lane Superstreet in the design year
- Greater direct impacts to adjacent property owners and resources due to wider footprint
- Not consistent with local plans that call for a four-lane roadway
- Overall lower public and local support

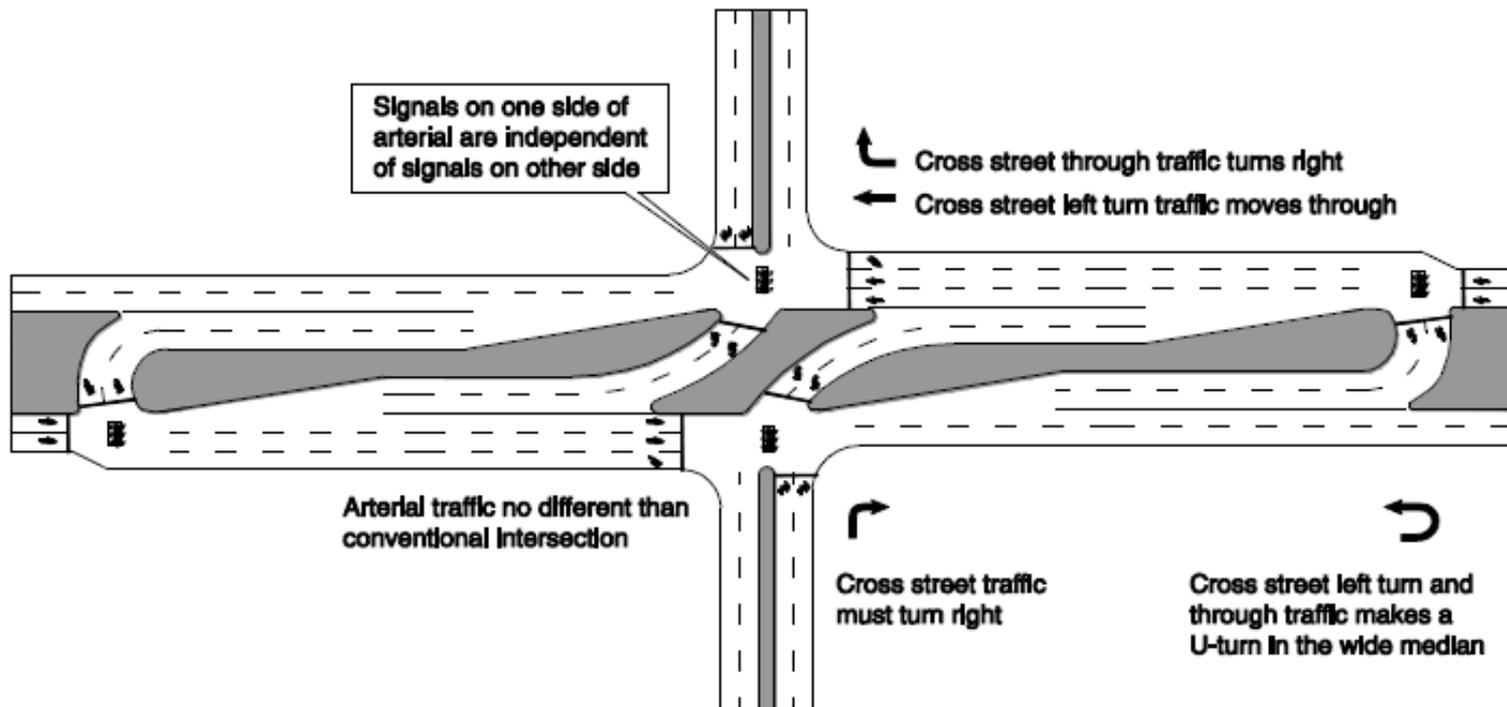


Why Superstreets?



What is a “Superstreet”?

- A type of intersection in which minor cross-street traffic is prohibited from going straight through or left at a divided highway intersection.
- Minor cross street traffic is redirected to turn right and then make a U-turn to proceed in the desired direction.
- Other configurations possible based on site specific conditions.



FHWA-SA-14-070



Why Superstreets?

- Improved Safety
- Less Travel Time
- Economically Beneficial
- Environmentally Responsible

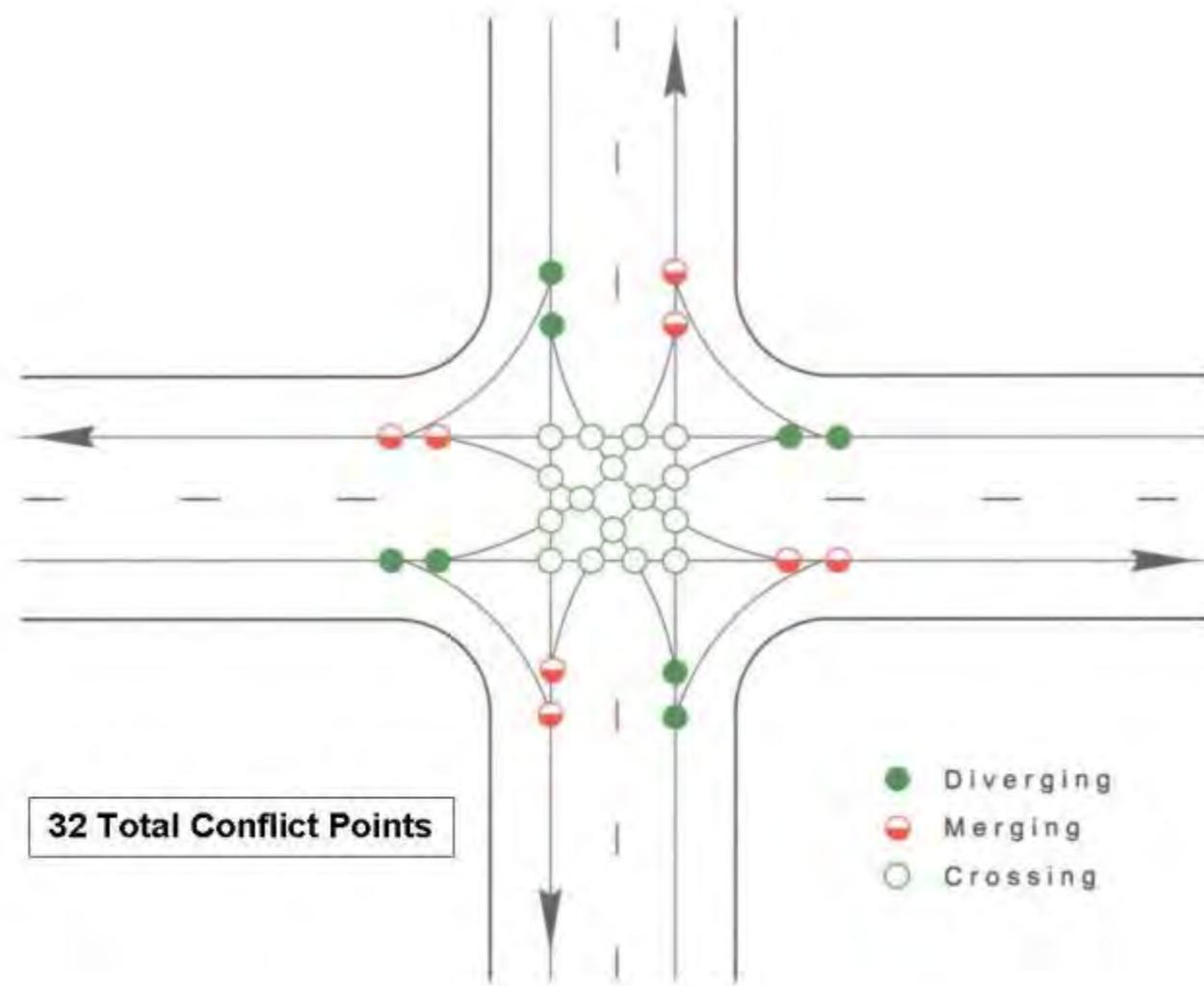


Improved Safety

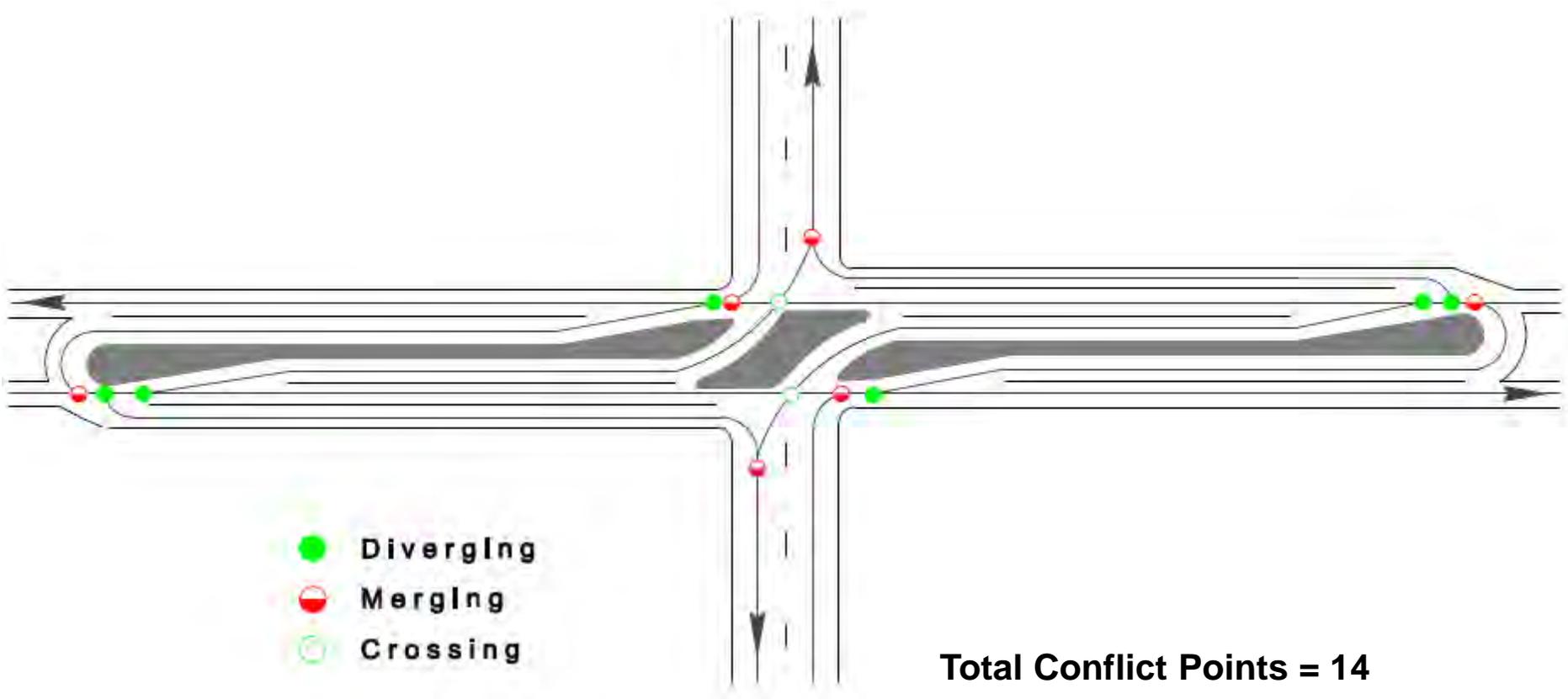
- Reduce likelihood of crashes, especially severe crashes such as side-collisions
- Fewer threats to crossing pedestrians



Conventional Intersection Conflict Points



Superstreet Conflict Points



Total Intersection Conflict Points

- Conventional Intersection – 32
16 Crossing Conflicts
- Superstreet Intersection – 14
2 Crossing Conflicts



Superstreets Benefits and Capacities

- Research project done 2009-06



Reduction in Crashes

- Safety impact by collision type for unsignalized superstreets, %

Collision Type	Crash Reduction %
Total	-46
Fatal and injury	-63
Angle and right turns	-75
Rear ends	-1
Sideswipes	-13
Left turns	-59
Other	-15



Safety Conclusions

- Unsignalized superstreets:
 - Reduced collisions for total, angle and right turn, left turn, and fatal and injury
 - Total collisions reduced by 46%

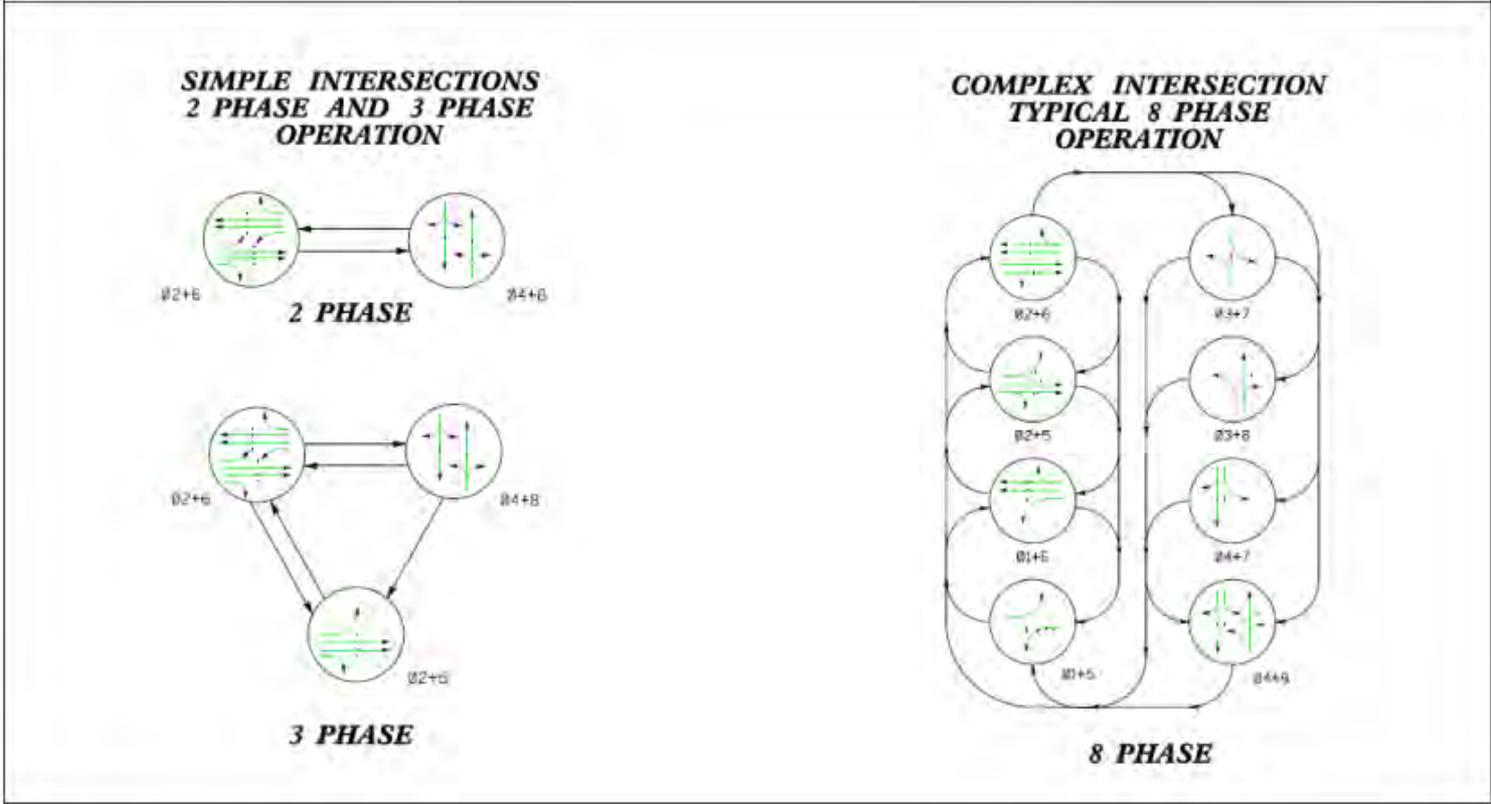


Less Travel Time

- Reduce “wait time” or delay
- Increase roadway capacity



Traffic Signal Phasing



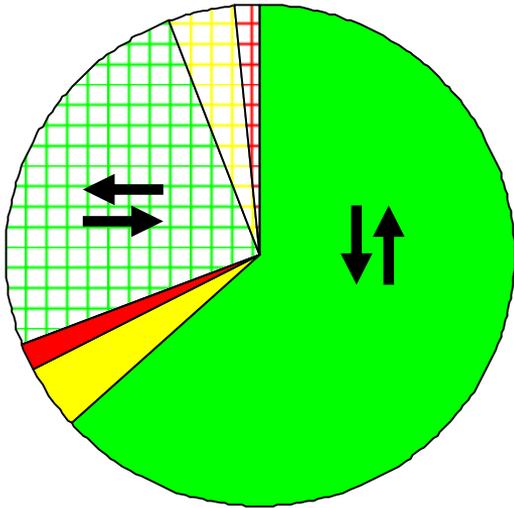
Less Delay

Current Phasing More Delay



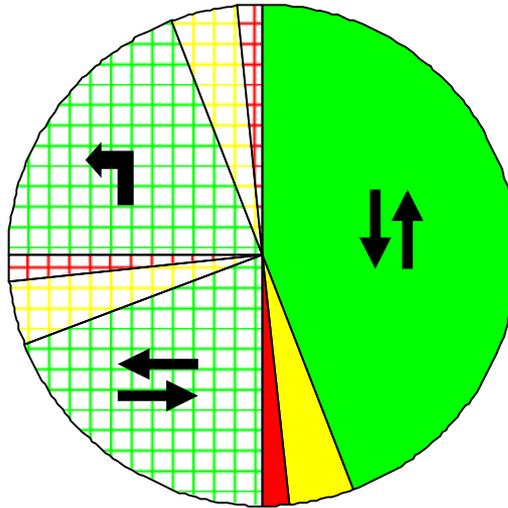
Green Time

Signal Timing - Two Phase

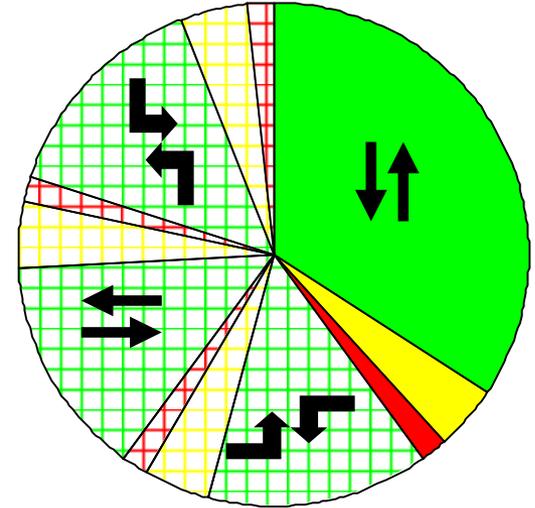


Superstreet =
Less Delay

Signal Timing - Three Phase



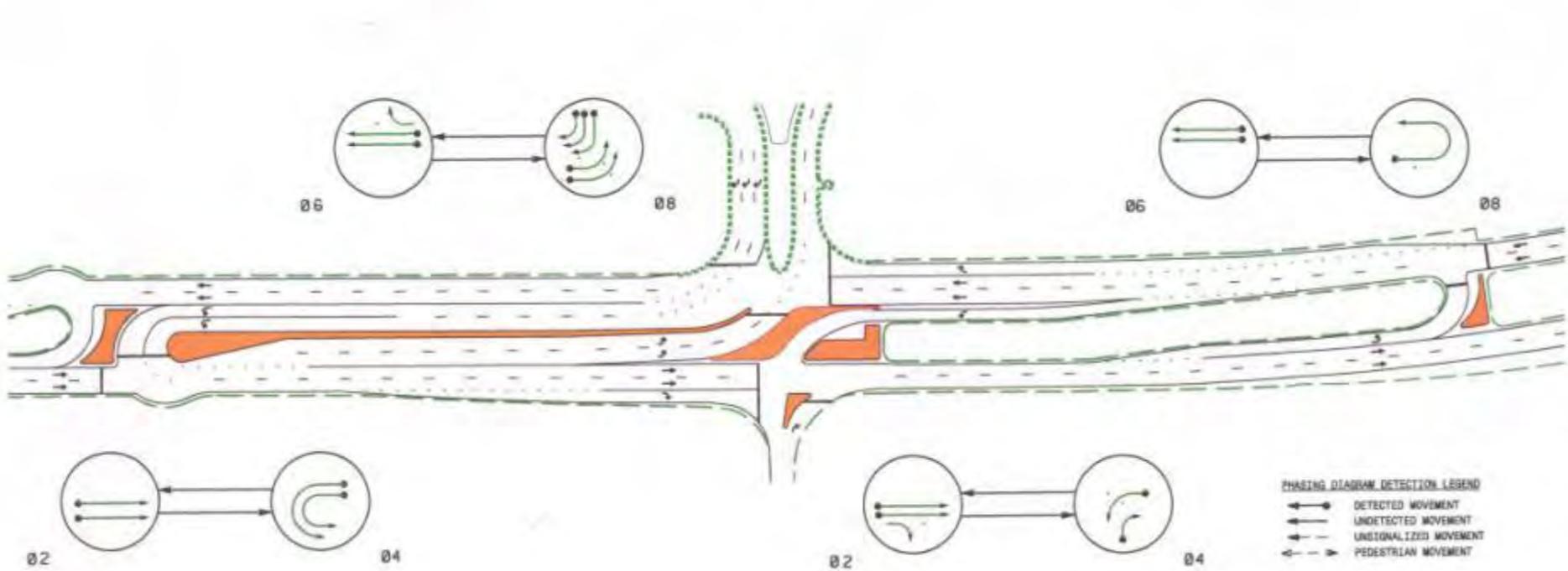
Signal Timing - Eight Phase



Current Phasing =
More Delay



Superstreet Phasing



Less Delay



Economically Beneficial

- Preserves the existing facility
- Less expensive than an interchange
- Provides good access to both sides of the main road for development



Environmentally Responsible

- Less time spent idling at a red light
- Reduction in environmental pollutants (exhaust fumes/fuel usage)
- Less acreage impacted by construction and permanent facility



Superstreet Issues/Concerns

- Public Acceptance
- Driver Unfamiliarity/Confusion
- Side Street Delays
- Emergency Vehicle Access
- Bicycles



Summary of Superstreet Benefits

- Safety
- Time savings
- Increased capacity
- Improved traffic flow
- Access management
- Land use and corridor protection
- Alternative to interchange (Less \$\$\$)
- Smaller “footprint” than an interchange



Superstreets in North Carolina

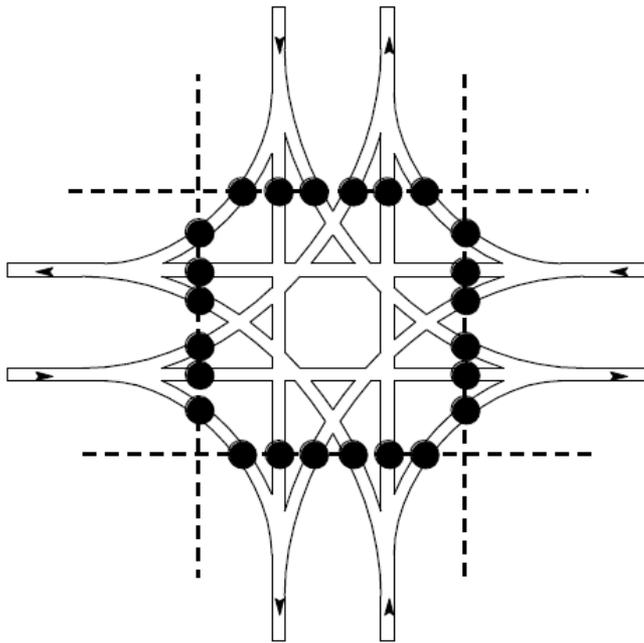
- Selected Existing Locations
 - US 15/501 in Chapel Hill, Orange County (Signalized)
 - US 17 in Pender & New Hanover Counties (Signalized)
 - US 17 in Leland, Brunswick County (Signalized)
 - US 23-74 in Haywood County
 - US 1 in Moore County, Vass Bypass
 - NC 87 in Elizabethtown, Bladen County
 - US 601 in Union County
 - US 17 By-Pass in Martin and Beaufort Counties
- Proposed Locations
 - NC 87 in Harnett County
 - Poplar Tent Road, Concord, Cabarrus County
 - NC 24-27 in Mecklenburg County
 - NC 55 in Holly Springs, Wake County
 - Over 60 TIP Projects throughout the state



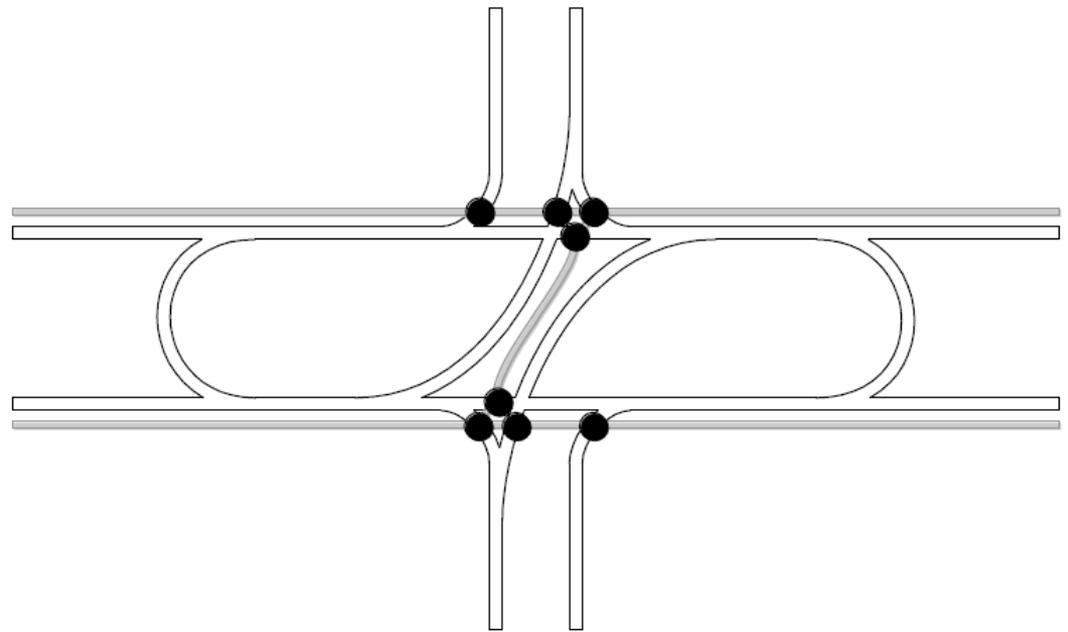
Pedestrians and Bicyclists on Superstreets



Pedestrian-Vehicle Conflict Points



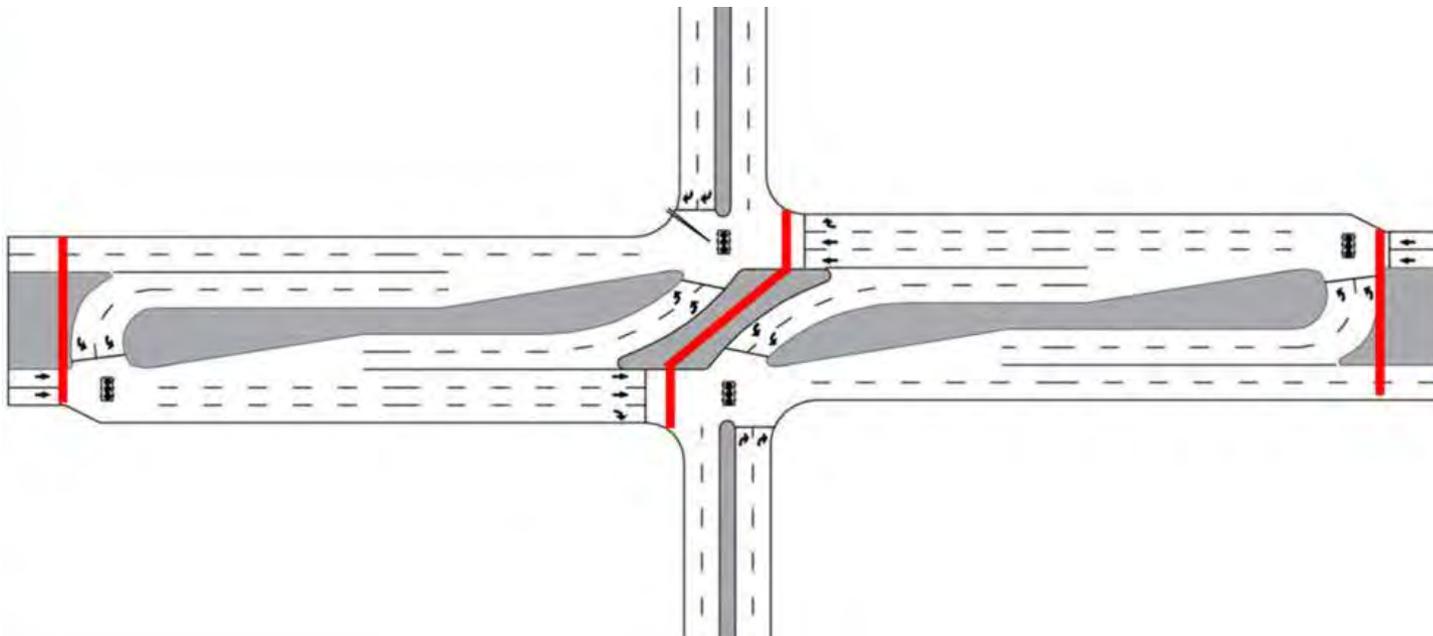
Conventional



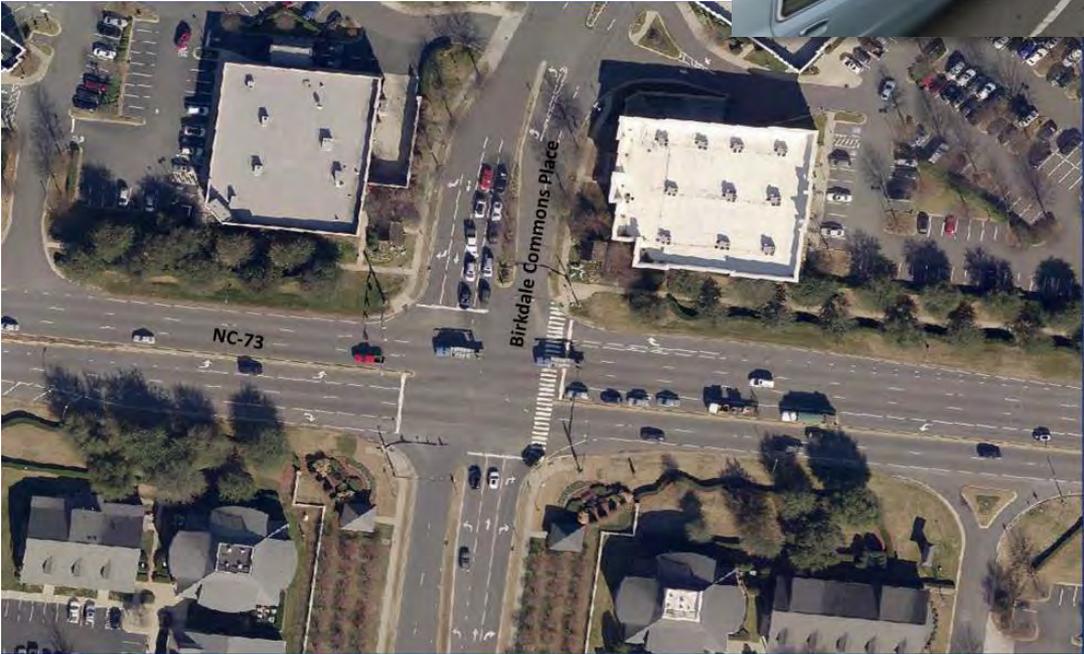
Superstreet

How Do Pedestrians and Bicyclists Cross a Superstreet?

- Safety is also increased for pedestrians and bicyclists.
- There are fewer threats to crossing pedestrians because the traffic flow is simplified and the potential conflicts with turning vehicles are reduced.
- The island provides refuge for the pedestrian as they cross the roadway.
- Pedestrians have to cross fewer lanes at a time since they are able to get a break in the middle by using the “z pattern, a two-stage crossing where they wait in the center median.



Conventional Left Turns Are Not Pedestrian-Friendly



Synchronized Street Pedestrian/Bicyclist Crossings



Preferred Alternative

- Upgrading the existing two-lane uncontrolled access roadway to a four-lane median divided urban roadway
- Non-traditional specific design treatments (mostly Superstreet design) at intersections
- Access management (e.g. signalization, median, control of access at intersections)
- Modification of the existing diamond interchange at East John Street/I-485 to a partial cloverleaf
- Bicycle and pedestrian accommodations
- Opportunity for median landscaping and within the berm adjacent to the roadway (type to be determined)



Next Steps/Future Activities

- Preliminary Design & Detailed Evaluation in EA
- EA Approval by FHWA (Tentative June 2016)
- Pre-Hearing Open House & Public Hearing (Tentative Late Summer 2016)
- FONSI (Tentative November/December 2016)
- Right of Way & Construction (All Sections - 2020, 2022)

