

# SW 27<sup>th</sup> Ave (CR 475A) at SW 66<sup>th</sup> Street Preliminary Engineering Report



## Agenda

- Project Background and Need
- Traffic Forecasting
- Safety Analysis
- Operational Analysis
- Concept Design and Construction Costs
- Key Findings

# Project Background and Need

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## Project Background

- SW 27<sup>th</sup> Ave (CR 475A) is a key north-south roadway providing a parallel route to I-75
- Current challenges faced
  - SW 27<sup>th</sup> Ave lays in a valley, leading to frequent flooding
  - SW 27<sup>th</sup> Ave and SW 66<sup>th</sup> Street can experience heavy delays (especially for turning traffic)
- The Preliminary Engineering Report (PER) study seeks to evaluate alternatives

### Key Objectives

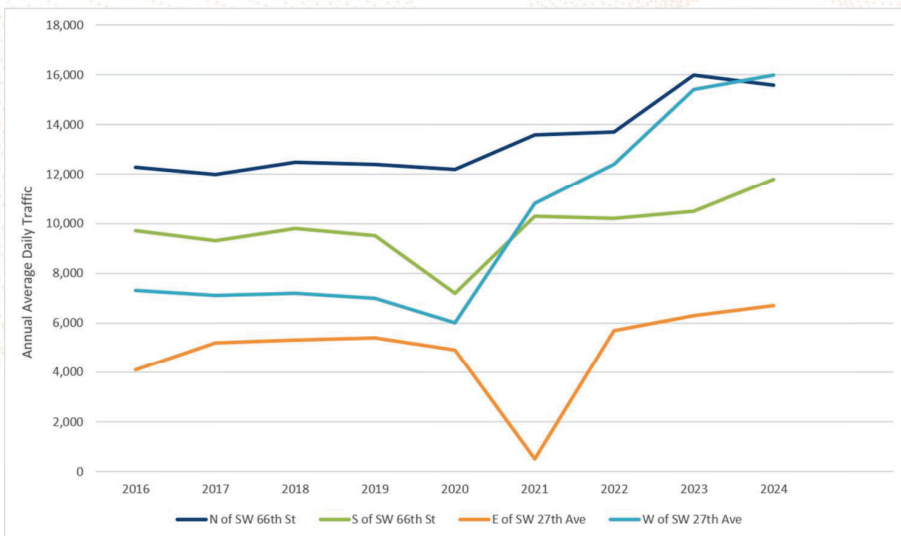
- ✓ **Raise Intersection and Improve Drainage Systems**
- ✓ **Reduce Traffic Congestion**
- ✓ **Provide Safety Benefits**

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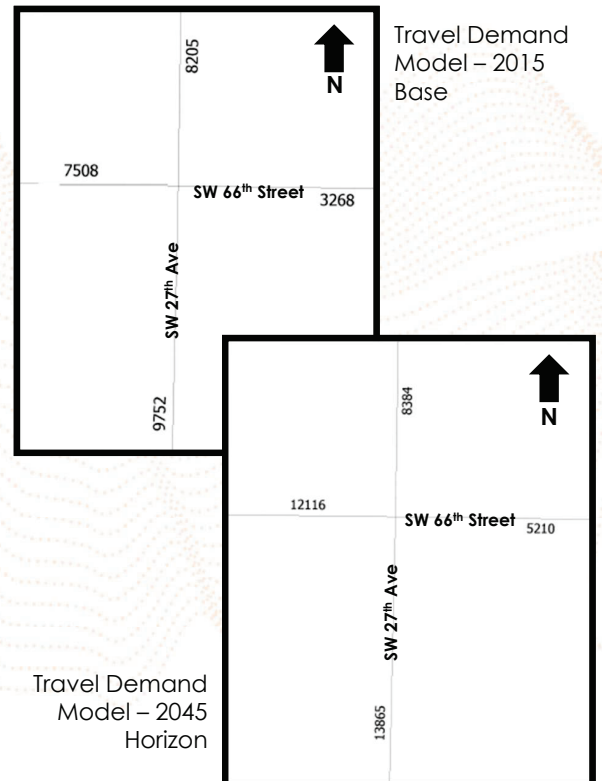
# Traffic Forecasting

## Traffic Growth Trends

Historical traffic data from Ocala-Marion TPO and future regional projections from the Central Florida Regional Planning Model were evaluated



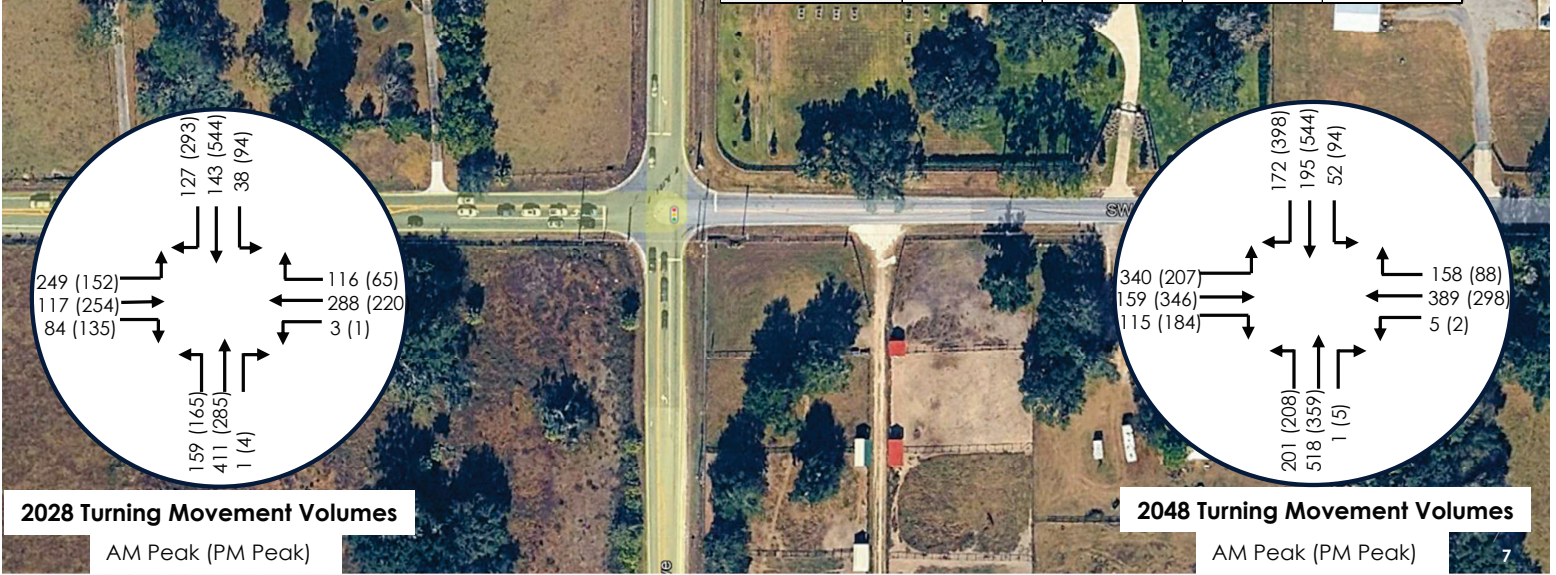
Historical Traffic (2016 - 2024)



# Selected Annual Growth Rate

Growth rates projected by the travel demand model were selected in coordination with Marion County staff

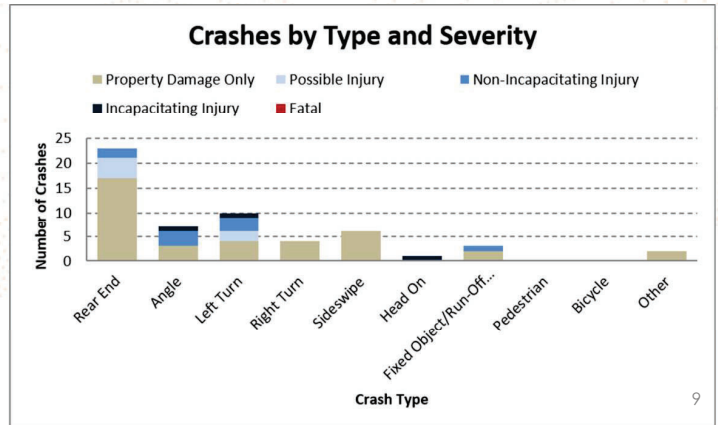
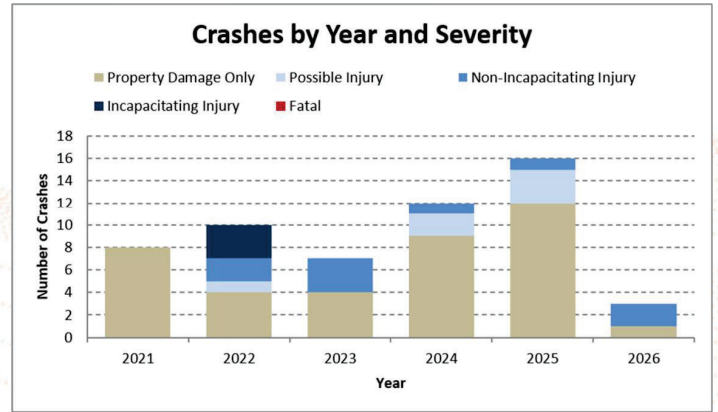
Road Segment	2024 AADT	Selected Annual Growth Rate	2028 AADT	2048 AADT
West of SW 27th Ave	16,000	2.05%	17,500	24,000
East of SW 27th Ave	6,700	1.98%	7,500	10,000
North of SW 66th Street	15,600	2.00%	17,000	23,500
South of SW 66th Street	11,800	1.41%	12,500	16,000



# Safety Analysis

# Historical Safety

- Signal4 Analytics was used to pull crash data
  - January 1, 2021, to April 7, 2026
- Rear Ends were most common crash type (41%)
  - Left Turn crashes 2<sup>nd</sup> most common (18%)
- 0 Fatal crashes, 3 Serious Injury crashes



## Safety Performance for Intersection Control Evaluation (SPICE) Results

- SPICE methodology predicts the future number of crashes based on intersection characteristics and existing data
  - Control Strategy
  - Intersection Geometrics (turn lanes, etc.)
  - Opening Year and Design Year traffic volumes
- 20-Year Project Life Cycle evaluated (2028 to 2048)
- Roundabout alternatives are predicted to have less crashes than signals over 20-Year life cycle

Control Strategy	Crash Type	Total Project Life Cycle	Crash Prediction Rank
Traffic Signal	Total	120	3
	Fatal & Injury	64	
Traffic Signal (Alt)	Total	120	4
	Fatal & Injury	64	
1-lane Roundabout	Total	46	1
	Fatal & Injury	28	
2-lane Roundabout	Total	63	2
	Fatal & Injury	31	

\*Crashes based on total project life cycle

# Operational Analysis

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## Intersection Performance Metrics

- Level of Service (LOS) is a key metric for intersection operations
  - LOS is a letter grade based on total intersection delay
  - LOS targets vary between signalized and unsignalized intersections (roundabouts)
  - Marion County Comprehensive Plan maintains target LOS standards
- Volume-to-Capacity Ratios
  - Intersections over capacity are considered operationally deficient, regardless of LOS

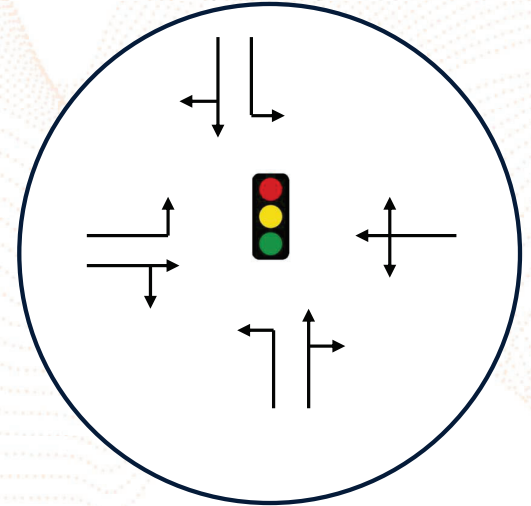
Level of Service (LOS)	
LOS	Signalized / Unsignalized Delay (seconds)
A	≤ 10 / 0 – 10
B	> 10 – 20 / > 10 – 15
C	> 20 – 35 / > 15 – 25
D	> 35 – 55 / > 25 – 35
E	> 55 – ≤ 80 / > 35 – 50
F	> 80 / > 50

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# Existing Signal Configuration

- 2028 Opening Year
  - AM and PM peak hours operate at LOS C
  - Intersection approach volumes are under capacity in both peak hours
- 2048 Design Year
  - Intersection approach volumes are over capacity in both peak hours
  - AM operates at LOS E, and PM operates at LOS F

Existing Configuration

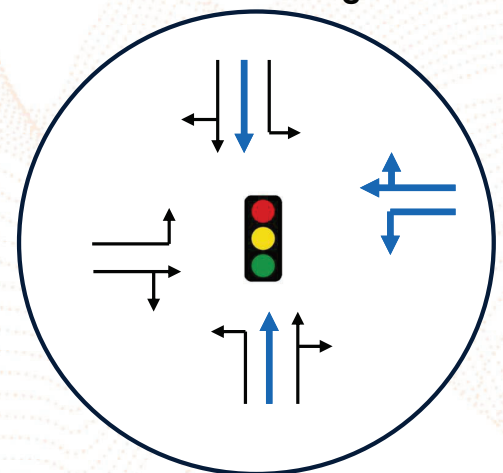


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# Modified Signal

- Analysis indicates need to add new northbound and southbound lanes, as well as an exclusive westbound left turn lane
- 2028 Opening Year
  - AM and PM peak hours operate at LOS C
  - Intersection approach volumes are under capacity in both peak hours
- 2048 Design Year
  - AM operates at LOS D, Volumes approaching capacity
  - PM operates at LOS C, Volumes under capacity

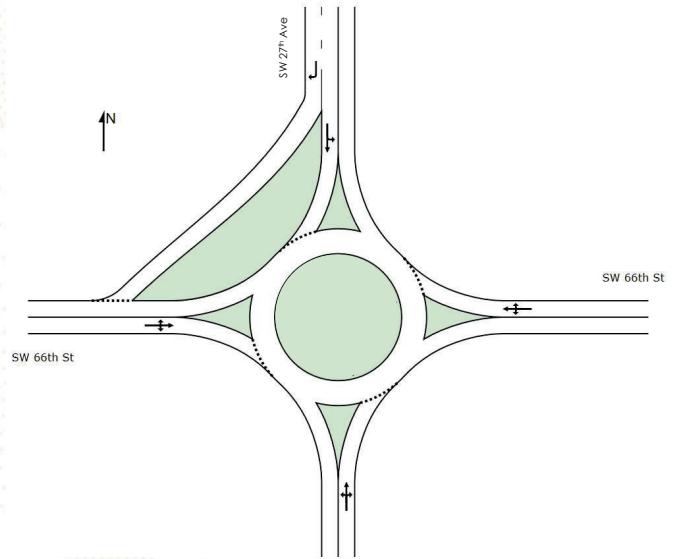
Modified Lane Configuration



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# Single Lane Roundabout

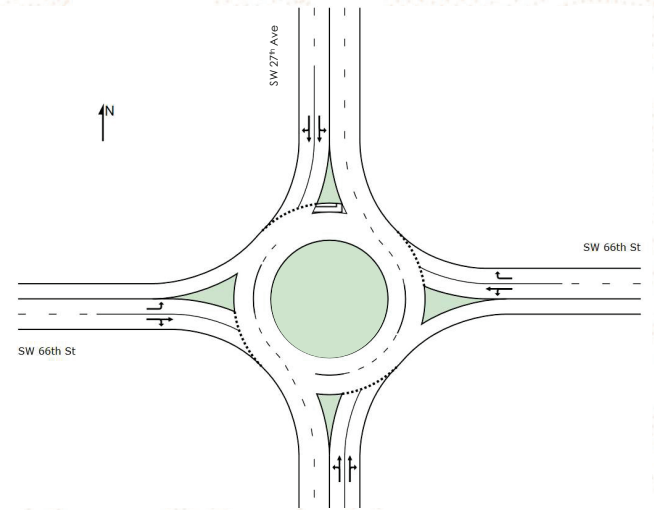
- 2028 Opening Year
  - AM and PM peak hours operate at LOS B
  - Intersection approach volumes are under capacity in both peak hours
- 2048 Design Year
  - Intersection approach volumes are over capacity in both peak hours
  - AM operates at LOS F, and PM operates at LOS E



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# Multi-Lane Roundabout

- Analysis indicates need to add new northbound and southbound lanes, as well as an exclusive westbound right turn lane and eastbound left turn lane
- 2028 Opening Year
  - AM and PM peak hours operate at LOS A
  - Intersection approach volumes are under capacity in both peak hours
- 2048 Design Year
  - AM and PM peak hours operate at LOS B
  - Intersection approach volumes are under capacity in both peak hours



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# Concept Design and Construction Costs

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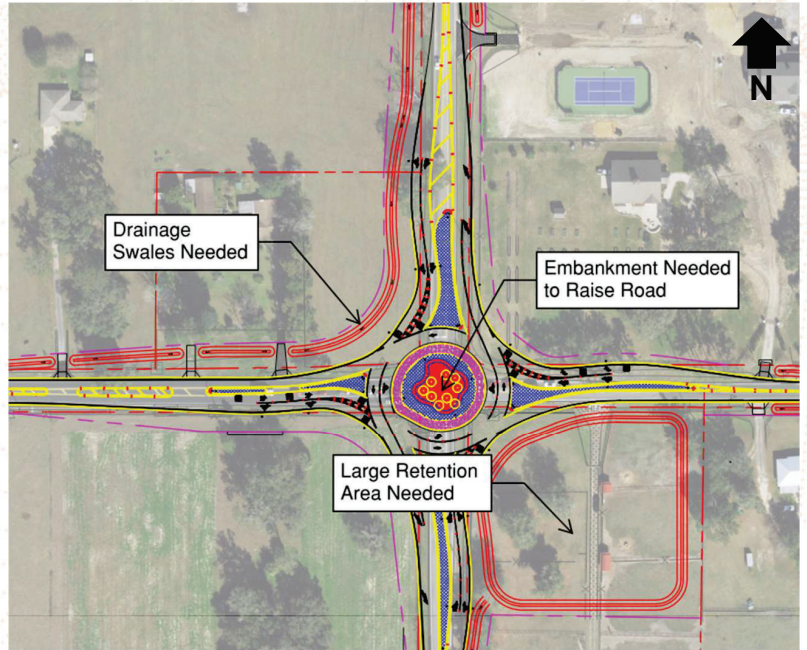
## Cost Estimate Methodology

- FDOT Pay Items for various construction elements were utilized to estimate potential costs
  - Pay Item estimates are based on quantities lifted from intersection conceptual designs
- Soft Costs were added to address standard construction activities and project unknowns
  - Maintenance of Traffic: 15%
  - Mobilization: 5%
  - Contingency: 25%
- Cost Estimates are Construction Costs Only
  - Right-of-Way Costs were not estimated at this time

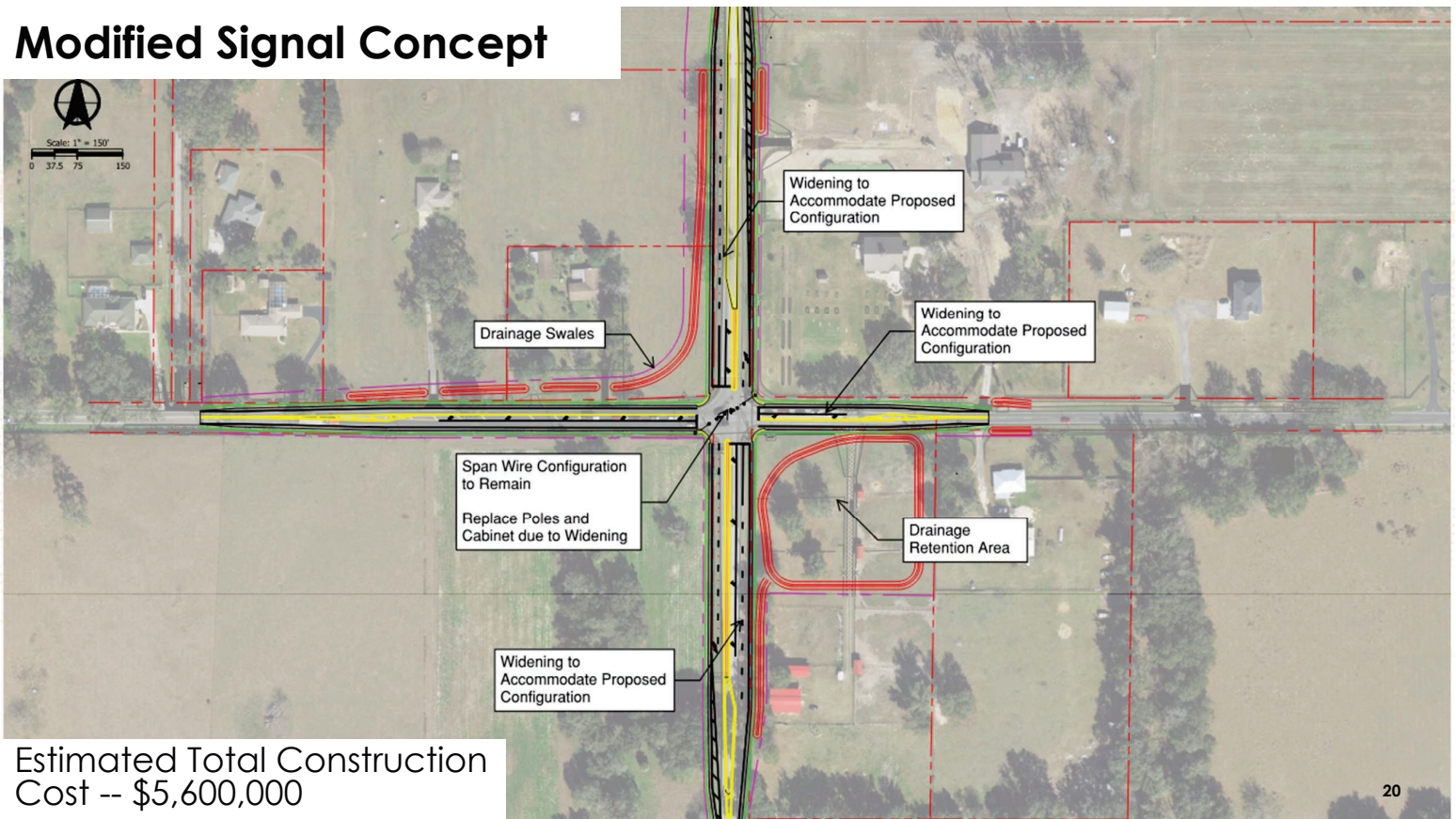
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# Universal Cost Items

- To meet key objectives, substantial improvements will be needed for all intersection types
  - Raising the roadway
  - Improving drainage systems
  - Adding intersection lighting
- Total estimated cost for drainage and lighting improvements is approximately **\$4 million**

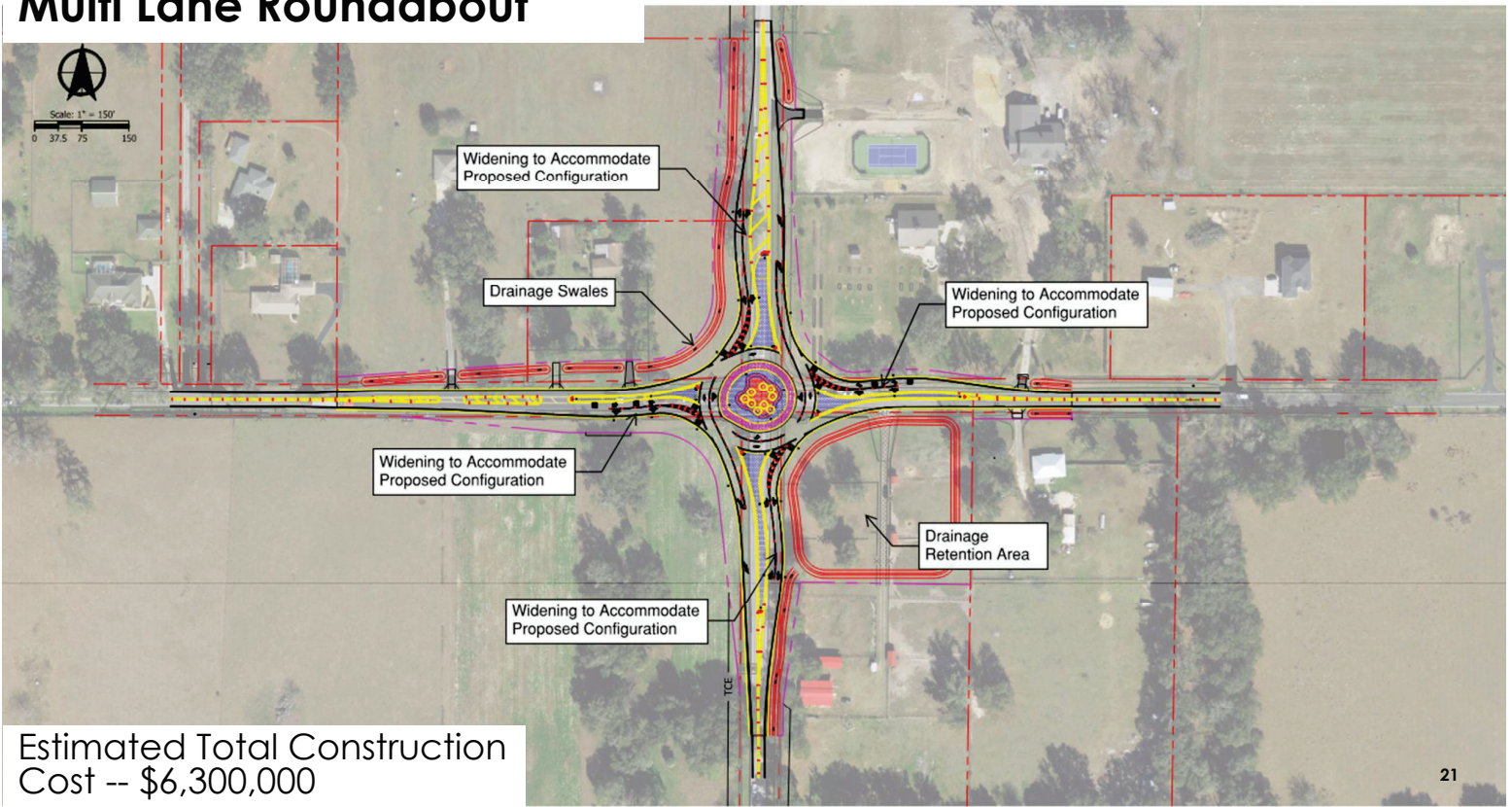


# Modified Signal Concept



Estimated Total Construction Cost -- \$5,600,000

# Multi Lane Roundabout



## Key Findings

# Alternatives Evaluation Matrix

Measures of Effectiveness		Existing Signal	Modified Signal	Single Lane Roundabout	Multi Lane Roundabout
Traffic Operations (2048)	Intersection LOS	F	D	F	B
	Maximum Volume to Capacity Ratio	1.26	0.96	1.36	0.83
	Intersection Delay (seconds)	99.0	44.3	69.7	13.5
Safety (Project Life Cycle)	Fatal & Injury	64	64	28	31
	Total	120	120	46	63
Construction Cost		--	\$5,600,000	--	\$6,300,000
Right-of-Way Impacts (ac)		--	4.1	--	3.9
Total Estimated Benefit		--	\$1,610,000	--	\$9,980,000
Benefit/Cost Ratio		--	0.29	--	1.59

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## Key Findings

- Intersection Control Evaluation (ICE) was performed to determine the best alternate for the intersection
- ICE showed the Multi Lane Roundabout has a Benefit Cost Ratio of 1.59 while the Modified Signal has 0.29
- Multi Lane Roundabout predicted to have less life cycle crashes than the modified signal
- Construction Costs Comparison
  - Modified Signal: \$5.6 Million
  - Multi Lane Roundabout: \$6.3 Million

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# Questions