



Grande Boulevard Reverse Curve:

Safety Improvements



Old Jacksonville Highway

Hollytree Drive

W Grande Blvd

W Grande Boulevard

Steele W

Cross Creek Cir

Hollyglen Dr
Hollybranch Dr
Hollylake Cir

Brynmar Ct

Brynmar Ct

Plantation Dr

Stoneleigh Dr

Raleigh Dr

Sheffield Dr

Wimbleton Dr

Creek Side Cir
Creek Side Dr

Hollybrook Dr

Northstar Blvd

Brynmar Cir

Warwick Dr

Northstar Blvd

Ashton Cv

Koberlin St

Chadbourne St

Van Buren St

W Grande Blvd

W Grande Boulevard

W Grande Blvd

Forbes Rd

Bradbury Ct

Ashmore Ln

Dover Ln

Wood Dr

Gleneagles Dr

Royal Oak Dr

Shady Oaks Dr

Bent Tree

Boca Raton Ct

La Vista Dr

Laguna Dr

Enseñada Dr

Estrella Del Mar Dr

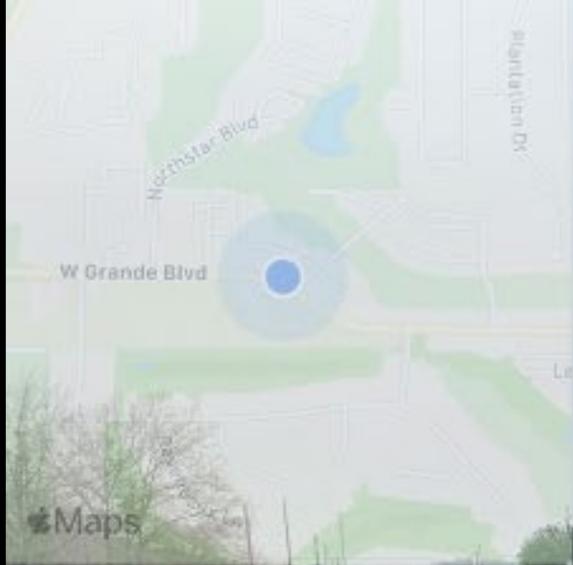
Del Norte Dr

Estancia Dr

Esperanza Pl

Asher Way

Asher Way



Mar 3, 2020 at 7:42:14 AM
291° W
1505 W Grande Blvd
Tyler TX 75703
United States



Looking Westbound



Mar 3, 2020 at 7:44:03 AM
344° N
1743–1855 W Grande Blvd
Tyler TX 75703
United States



Mar 3, 2020 at 7:43:58 AM

133° SE

1743-1855 W Grande Blvd

Tyler TX 75703

United States



Looking Eastbound



Existing Conditions

Negative Cross Slope Westbound Exiting Curve

Positive Cross Slope



Positive Cross Slope

Negative Cross Slope Eastbound Exiting Curve

Existing Conditions

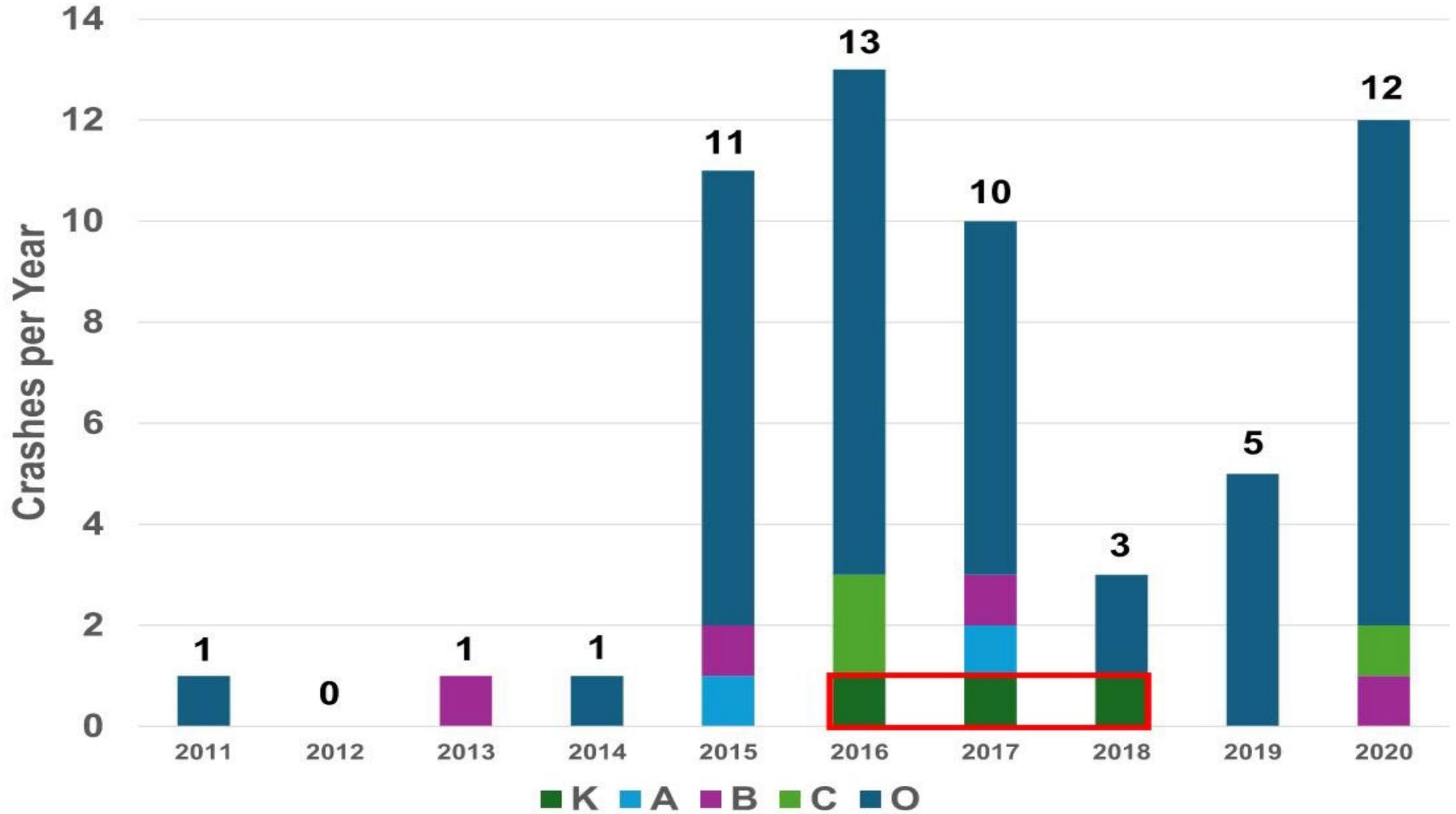


Westbound



Eastbound

W Grande Bouelvard Reverse Curve - Crash History



W Grande Blvd - Reported Crashes

Initiated by an Eastbound Vehicle

Legend

-  EB Head-On Crash
-  EB Sideswipe Crash
-  EB Single Vehicle Lost Control Crash



Google Earth

W Grande Blvd - Crash Zones

Zones for Reported Crashes Initiated by Westbound or Southbound Vehicles

Legend

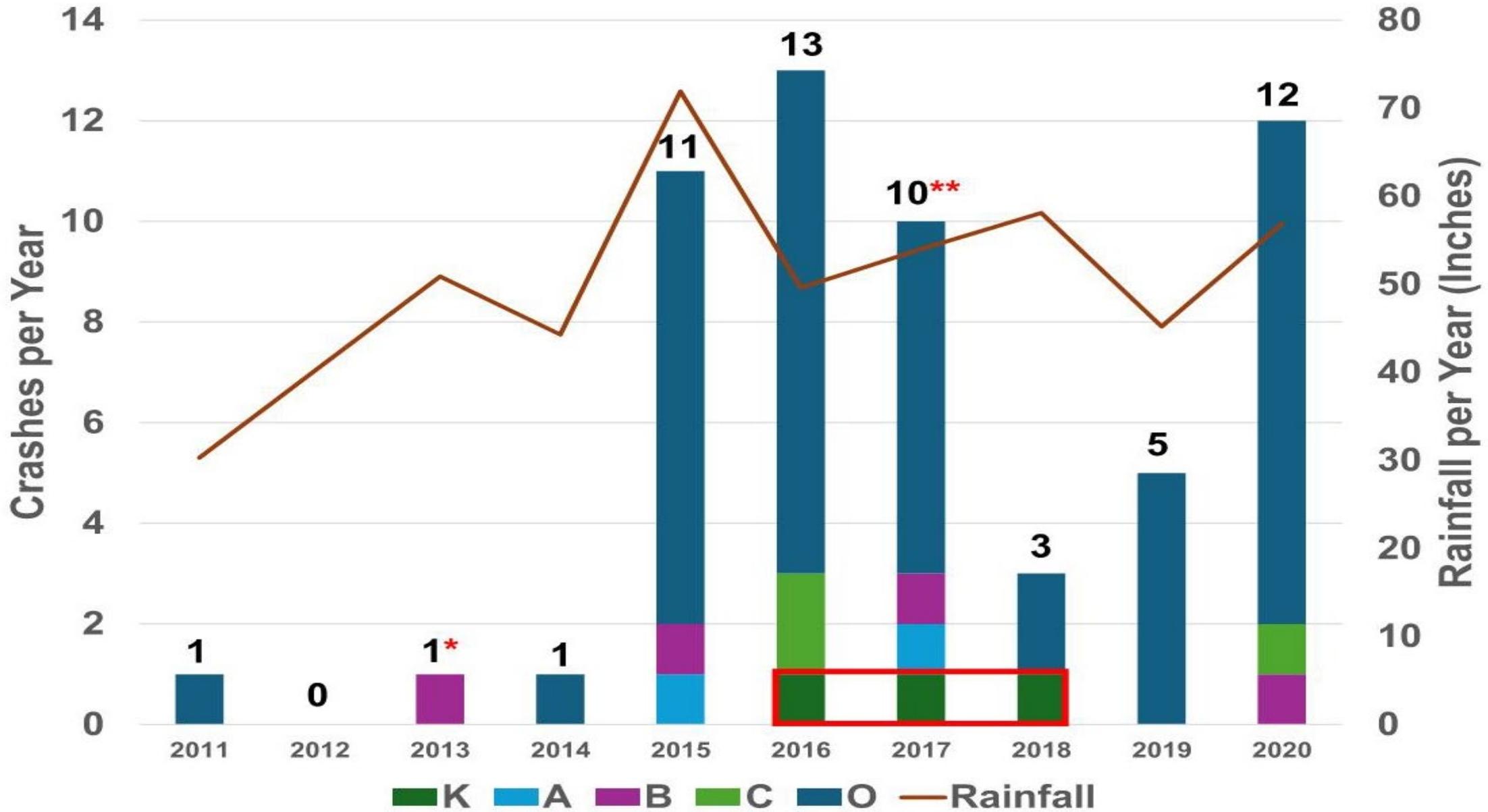
- SB Left Turn Crash
- WB Single Vehicle Lost Control Crash
- WB Head-on Crash
- WB Sideswipe Crash



Summary of Crash Trends

- Higher under wet conditions
 - 65% of crashes vs. 16% of crashes city wide
- Higher nighttime conditions due to no illumination (Dark, not lighted)
 - 42% of crashes vs. 7% of crashes city wide
- Over representation of fixed object crashes
 - 60% of crashes vs. 11% of crashes city wide
 - 35 of 57 crashes were single vehicle crashes

W Grande Boulevard Reverse Curve - Crash History



*** Edge mill & over lay 2013, ** Milled/grooved summer 2017**

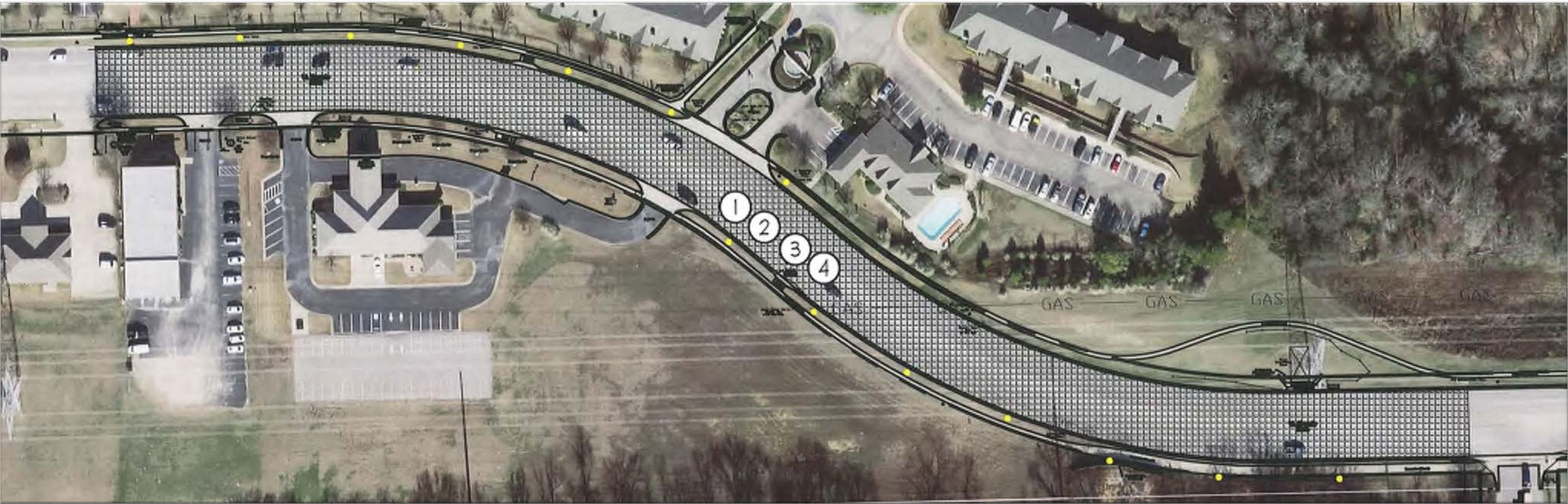
Option 1

- Install new LED illumination Chevron signing and new retroreflective raised pavement markings



Option 2

- Option 1 + Mill old pavement, install new pavement, and install High Friction Surface Treatment through the curve



Option 3

- Option 1 + 2 + relocate existing Oncor Tower on east end of curve



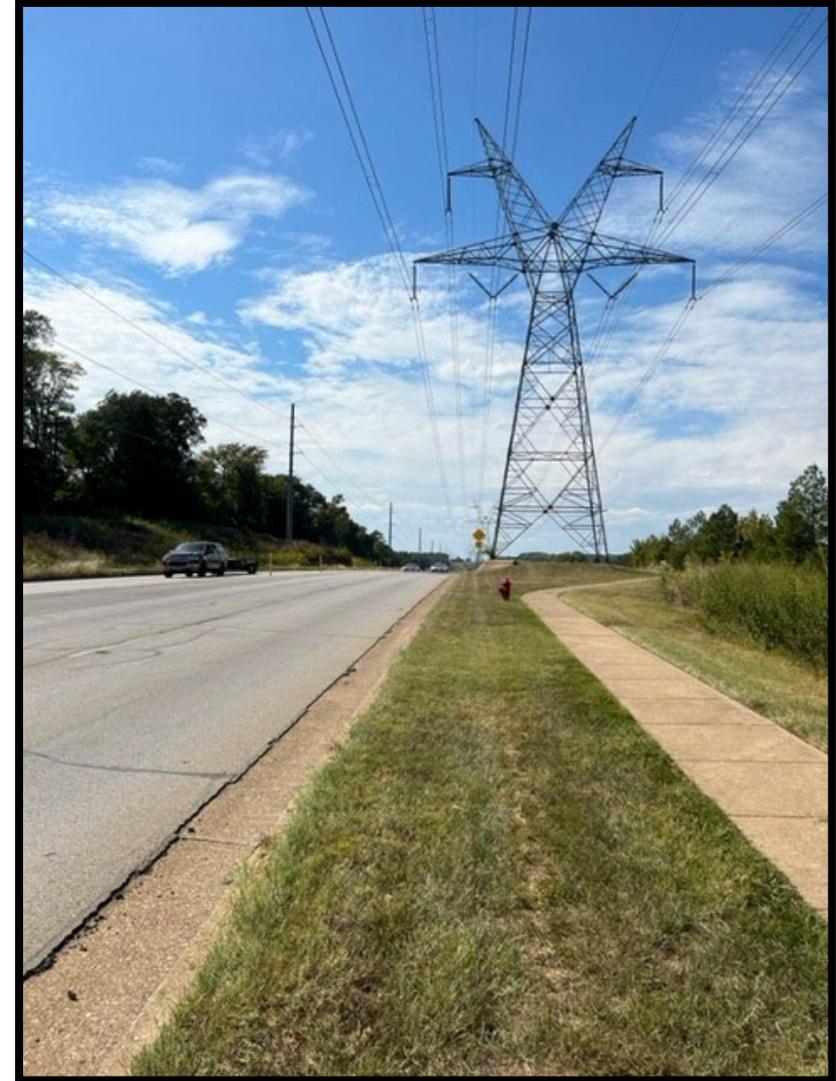
Option 4

- Relocate existing Oncor Tower & reconstruct existing pavement with super elevation and tangent between curves. Does require ROW acquisition.



Options Not Considered

- Lowering Speed Limit
- Illumination
- Raised Median
- Raised Traffic Barrier





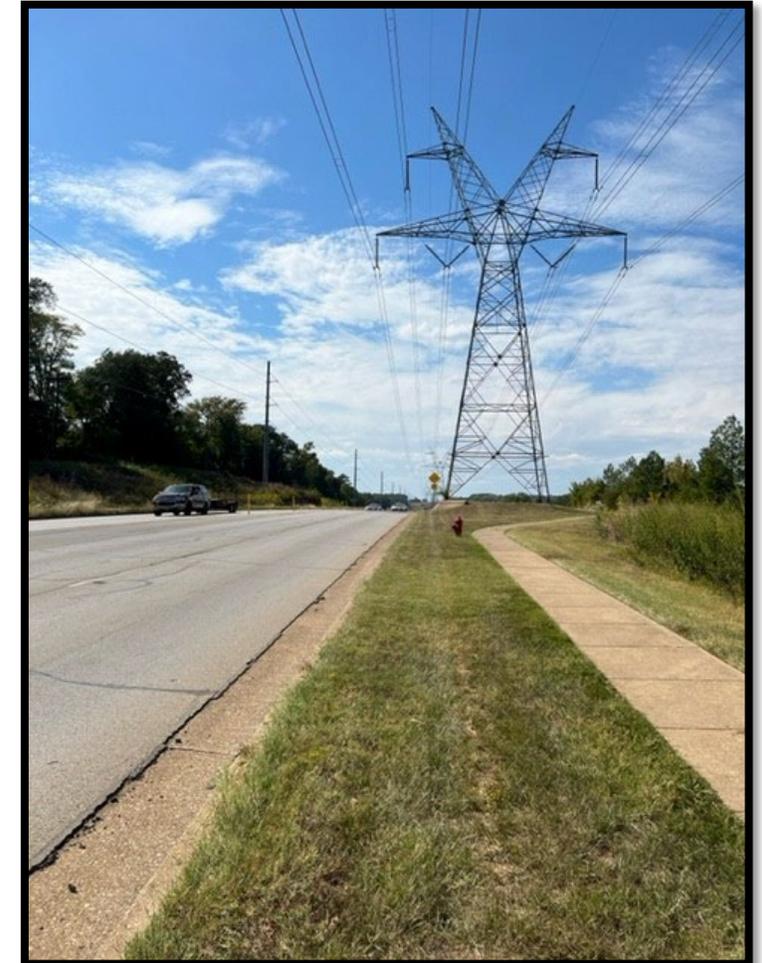
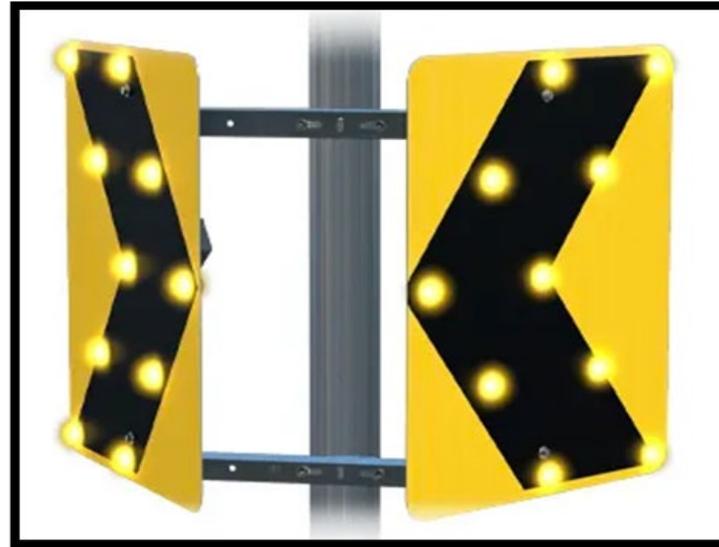
Summary of Options

Description	Yearly Benefit	Opinion of Cost	Benefit/ Cost Ratio
Option 1 (Pavement markings and signs)	\$867,020	\$180,235	4.81
Option 2 (Overlay, HFST, pavement markings, and signs)	\$2,424,807	\$639,804	3.79
Option 3 (Overlay, HFST, pavement markings, signs, relocate tower)	\$2,424,807	\$1,194,204	2.03
Option 4 (Reconstruct for super elevation, pavement markings, signs, & tower)	\$3,185,481	\$2,186,817	1.46

Recommended Path Forward

Option 3

- High Friction Surface Treatment
- LED Chevrons and reflective pavement markers
- Relocate Oncor Tower at east end of curve





But.....



Summary of Options - Updated

Description	Yearly Benefit	Opinion of Cost	Benefit/ Cost Ratio
Option 1 (Pavement markings and signs)	\$867,020	\$180,235	4.81
Option 2 (Overlay, HFST, pavement markings, and signs)	\$2,424,807	\$639,804	3.79
Option 3 - Updated (Overlay, HFST, pavement markings, signs, relocate tower)	\$2,424,807	\$2,507,454	0.96 (2.03)
Option 4 - Updated (Reconstruct for super elevation, pavement markings, signs, & tower)	\$3,185,481	\$3,500,067	0.91 (1.46)

Timeline & Construction Costs

Timeline

- **August 2021 – July 2022**
 - Safety Study
- **August 2023**
 - High Friction Surface Treatment
 - 6” Lane Lines
- **December 2023**
 - LED Curve Warning System
 - 6” profile edge lines

Construction Cost

- **High Friction Surface Treatment**
 - \$526,124
- **LED Curve Warning**
 - \$108,505*
- **Total Cost vs. EOPC**
 - \$632,629 vs. \$639,804
- **Total Cost to City**
 - \$536,524

High Friction Surface Treatment





The City of
Baltimore, Maryland

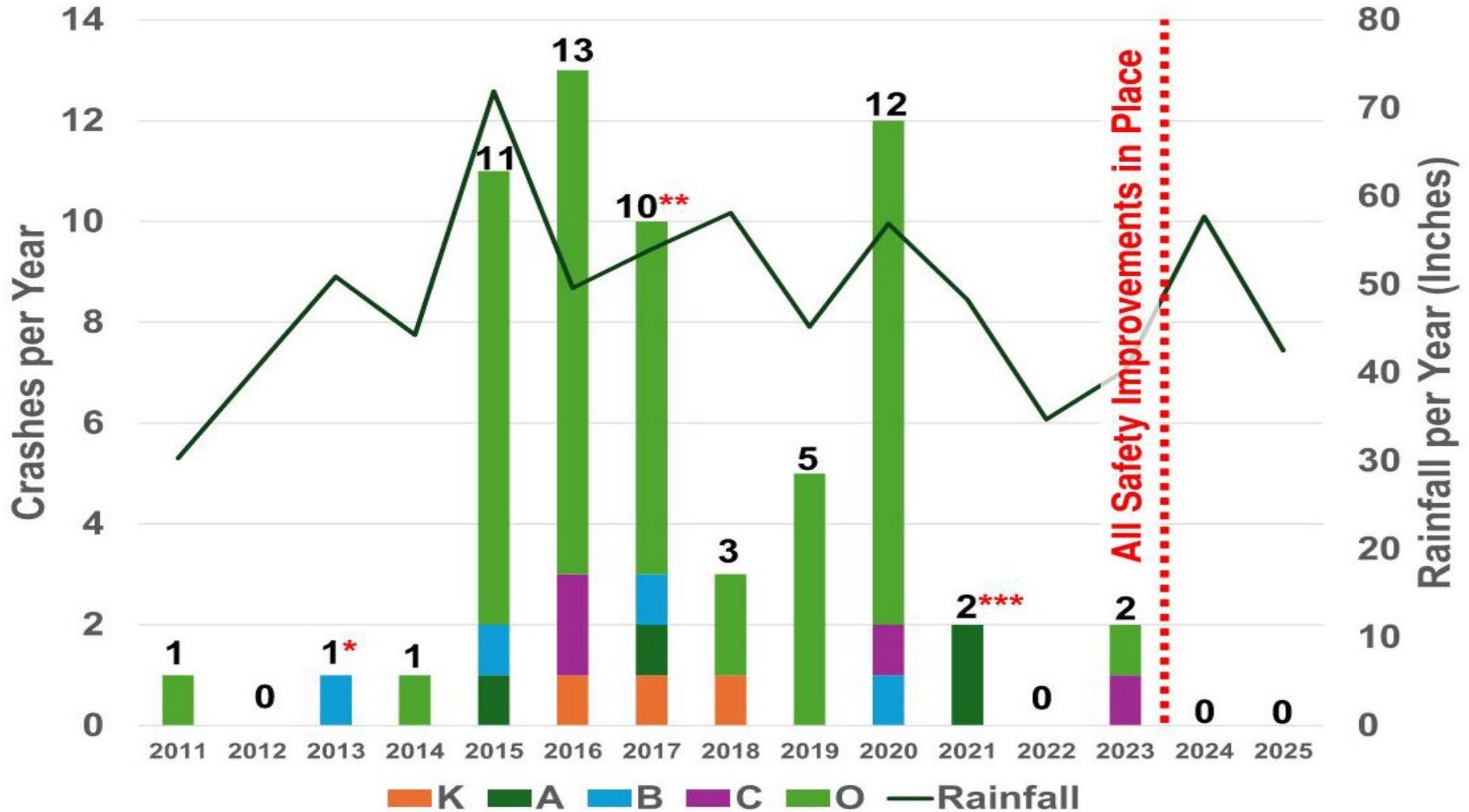
Skid Numbers – Before and After

Table 1 – Summary of Friction Test Results

Road	Direction	Surface	Passes	SN Avg	SN Min	SN Max	SN StDev	Avg Speed	Min Speed	Max Speed
W Grande Blvd	EB	Old	4	22.0	13.4	31.9	5.8	40.4	37.7	42.1
	WB	Old	4	21.0	15.5	33.7	4.7	38.8	24.5	42
	EB	New	5	68	53	76.5	5.00	39.84	38.7	41.9
	WB	New	5	64	45.7	72.1	5.78	38.17	34.2	42.8



W Grande Bouelvard Reverse Curve - Crash History



* Edge mill & over lay 2013, ** Milled/grooved summer 2017, *** Milled/grooved April 2021

Next Steps

- Continue to monitor crash trends
- Continue to measure pavement condition and skid numbers
- Apply treatments, as appropriate, to other locations within the City of Tyler





Contact Information

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