

Virginia Parkway Signals





1,400 feet

400 feet

1,000 feet

Proposed Retail Development

VIRGINIA PKWY

VIRGINIA ST

LOUISIANA ST

WILSON CREEK BLVD

ENTRANCE 40B RAMP

EXIT 40B RAMP

EXIT 39B RAMP

ENTRANCE 39B RAMP

75

GWENDOLYN DR

RANDY LEE LN

NORTH WOOD DR

CHERRY LN

WEST PARK DR

LAKEVIEW CIR

WESTWOOD CIR

REDBUD BLVD

HUNT ST

PAULIARD

Existing Virginia Parkway at US 75

- **Existing Conditions**

- Virginia Parkway is a 6-lane divided arterial roadway.
- Posted Speed: 40 MPH
- Traffic Volume:

• EB (VPD)	17,218
• WB (VPD)	17,360
• Total (VPD)	34,578

- **PM Peak Traffic**

- Video recordings (12/08/22 – Randy Lee) PM Peak

Importance of Proper Signal Spacing

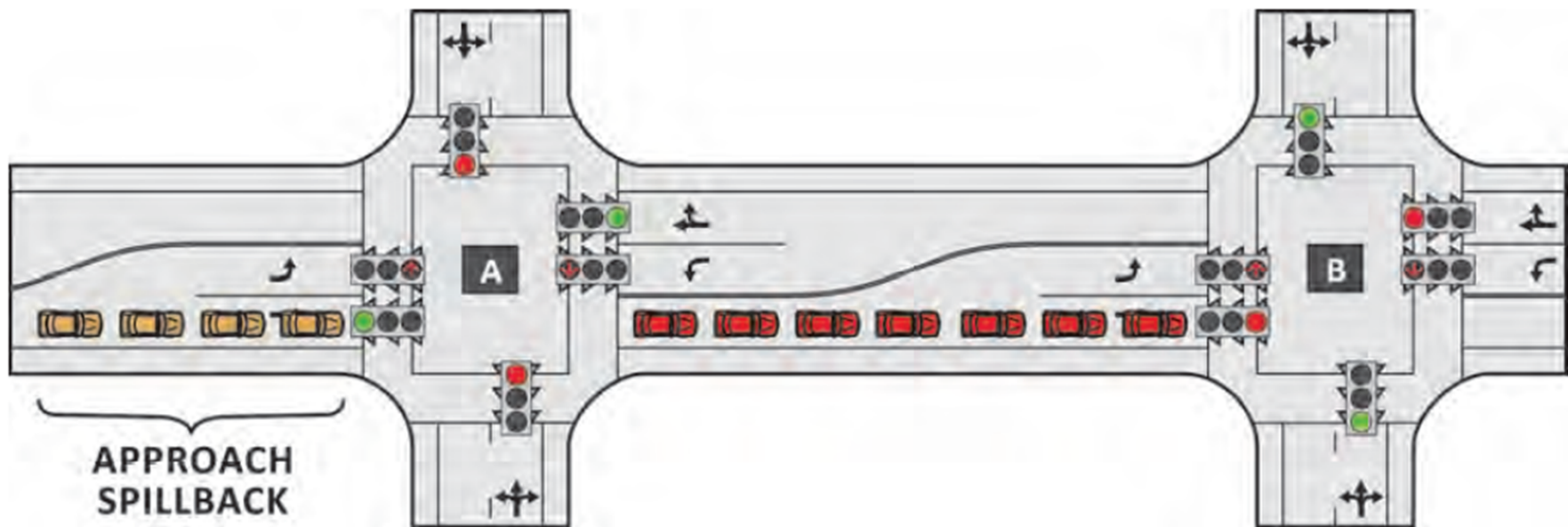
- **Progression**

- Progression along a major corridor is based on proper signal spacing.
- Recommended spacing between signals is 1,320 ft (1/4 mile) along an arterial roadway to obtain progression for both directions.
- City of McKinney Engineering Design Manual specifies the minimum spacing between signals is 1,200 ft.
- The closer the signals, the harder it is to provide progression.

Importance of Proper Signal Spacing

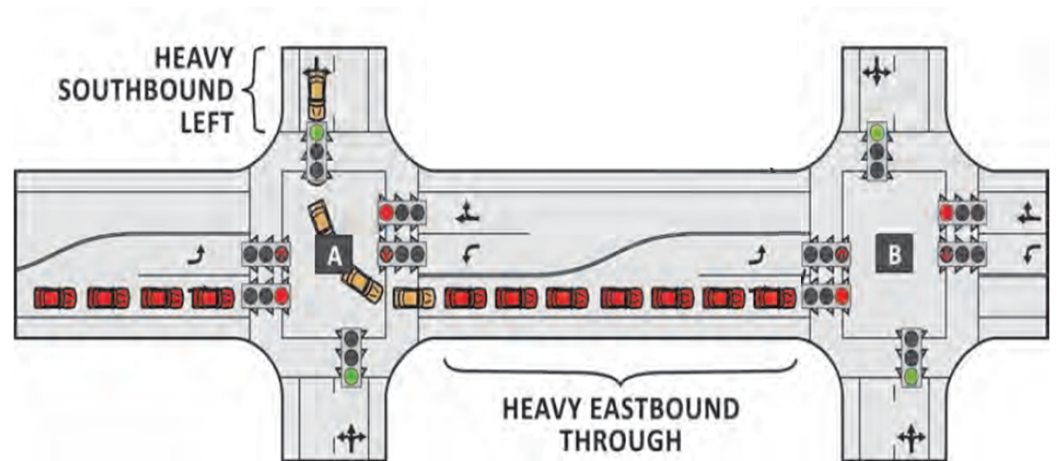
- **Queueing Length**

- Large queuing/stacking distances are needed for heavy demand approaches that are not able to clear within the signal cycle between signals.
- Small queuing length between signals will result in under utilized “green-time” for arterial roadway due to approach spillback as shown in below:



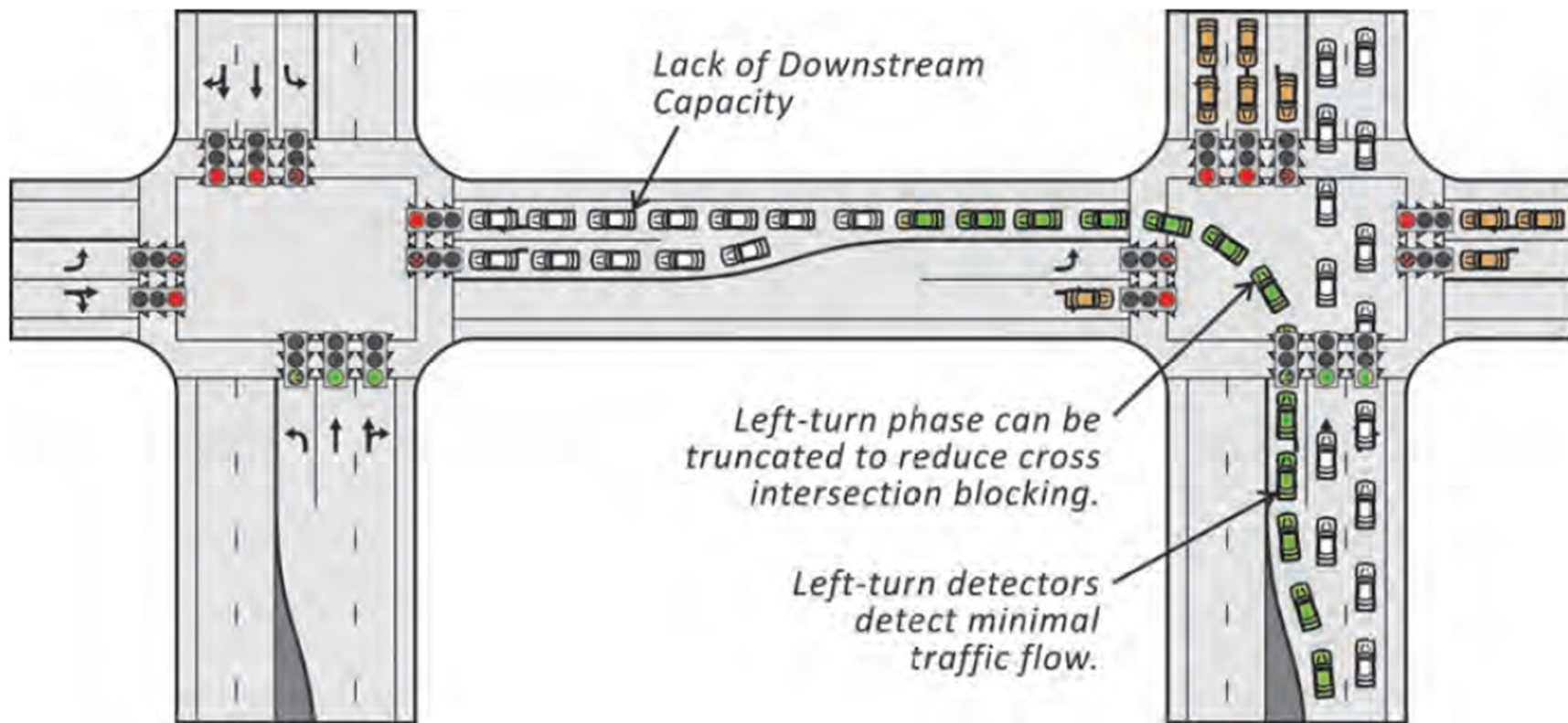
Importance of Proper Signal Spacing

- **Queueing Length**
 - Approach spillback also affects the side street turning traffic onto Virginia Parkway since there are no additional stacking space available due to approach the heavy eastbound traffic at the US75 approach not clearing on the first cycle as shown in below:



Future Considerations & Challenges with Signal Located Close to a Diamond Interchange

1. The “metering” of the upstream signal is necessary to manage queues for the downstream signal.
2. Emergency vehicle preemptions and pedestrian movement create additional operational challenges.



A decorative graphic on the left side of the slide, consisting of a yellow trapezoidal shape at the top, a dark grey trapezoidal shape below it, and a white diagonal line separating them. The rest of the slide is a solid light grey background.

Questions?

Proposed Retail Development

Horizon Year 2023 Total Traffic Conditions



Simulation Results - Build-Out Year (2023) Total Traffic Condition

Intersection	Movement	Average Delays (sec/veh)		95th Percentile Queue (feet)	
		Synchro/HCS		Synchro/HCS ²	
		AM	PM	AM	PM
Virginia Pkwy @ Randy Lee Lane	Intersection	16.4	16.6		
	EB	26.7	27.9	241	241
	WB	0.8	0.6	355	34
	NB	77.4	77.2	19	0
	SB	65.8	69.5	203	115
Virginia Pkwy @ North Driveway	Intersection	4.9	5.2		
	EB	1.3	1.2	30	28
	WB	2.1	2.3	198	287
	NB	59.9	55.9	120	120
	SB	47.5	47.1	11	0
Virginia Pkwy @ US 75 Southbound Frontage Road	Intersection	46.0	46.5		
	EB	47.7	36.7	530	571
	WB	3.6	5.9	288	367
	SB	97.7	114.7	708	590
Virginia Pkwy @ US 75 Northbound Frontage Road	Intersection	28.3	29.8		
	EB	4.1	3.8	7	1
	WB	41.1	35.7	213	217
	NB	45.1	51.0	449	559

¹ Queue lengths in *italic* - volume for queue is metered by upstream signal
Queue lengths in bold - 95th percentile volume exceeds capacity, queue may be longer

WESTWOOD CIR

Proposed Retail Development

Horizon Year 2033 Total Traffic Conditions



Horizon Year (2033) Total Traffic Condition					
Intersection	Movement	Average Delays (sec/veh)		95th Percentile Queue (feet)	
		Synchro/HCS		Synchro/HCS ¹	
		AM	PM	AM	PM
Virginia Pkwy @ Randy Lee Lane	Intersection	18.9	19.5		
	EB	31.1	33.6	531	361
	WB	1.3	0.9	638	62
	NB	76.2	76.1	22	0
Virginia Pkwy @ Sprouts' Driveway	Intersection	5.2	5.4		
	EB	1.9	1.9	43	34
	WB	3.0	3.1	329	351
	NB	59.6	55.8	123	122
Virginia Pkwy @ US 75 Southbound Frontage Road	Intersection	48.6	48.0	36	11
	EB	82.8	91.4		
	WB	93.2	77.3	1040	975
	NB	5.5	13.7	365	416
Virginia Pkwy @ US 75 Northbound Frontage Road	Intersection	167.1	215.3	1005	841
	EB	34.7	44.3		
	WB	4.8	5.7	180	340
	NB	41.7	39.3	186	304
		61.5	86.5	663	795

¹ Queue lengths in *italic* - volume for queue is metered by upstream signal
 Queue lengths in **bold** - 95th percentile volume exceeds capacity, queue may be longer

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