

Table 1: Operational Analysis of Initial Alternatives

Alternative Type	Figure #	Configuration		Exposition Dr and 1 <sup>st</sup> Ave North Intersection				Operations Improve From No-Build?	Preliminary Consultant Recommendation	Why?	Support from PAC	Support from MDT	
				2040 Weekday AM Peak Hour		2040 Weekday PM Peak Hour							
				Delay (sec)/ LOS <sup>1</sup>	V/C <sup>2</sup>	Delay (sec)/ LOS	V/C						
Conventional Signal	1A	No-Build		28.7/C	0.76	78.6/E	1.20	No	Yes	Used to compare build alternatives			
	1B	Westbound Shared Left/Right-Turn Lane		27.9/C	0.89	59.6/E	1.06	Yes	Yes	Enhances operations with low cost improvement			
		OR Single Westbound Left-Turn Lane and Dual Westbound Right-Turn Lanes		31.3/C	0.85	64.6/E	1.07	Yes	Yes				
	1C	Free Westbound Right-Turn Lane Plus 4 <sup>th</sup> Northbound Through Lane		30.1/C	0.73	42.5/D	0.90	Yes	Yes	Enhances operations; simple capacity improvement. Additional analysis needed to assess weaving operations.			
	1D	Dual Westbound Right-Turn Lanes		27.7/C	0.71	41.4/D	0.90	Yes	Yes	Enhances operations; simple capacity improvement			
	1E	Triple Southbound Left-Turn Lanes		30.4/C	0.75	63.4/E	1.20	No	No	Minimal operations benefit; helps with queue storage for southbound left-turn lane. Lane utilization concerns.			
1F	Triple Southbound Left-Turn Lanes and Dual Westbound Right-Turn Lanes		28.6/C	0.67	40.1/D	0.84	Yes	No	Enhances operations, but minimal benefit with third southbound left-turn lane. Lane utilization concerns.				
Multilane Roundabout <sup>3</sup>	2A	Three Circulatory Lanes		46.8/E	1.068 <sup>3</sup>	140.9/F	1.434 <sup>3</sup>	No	No	No operational benefit			
	2B	Three Circulatory Lanes with Westbound Right-Turn Bypass		45.6/E	1.068 <sup>3</sup>	105.6/F	1.434 <sup>3</sup>	No	No	No operational benefit			
System & Alternative Routes	3A	Extend Montana Avenue/1 <sup>st</sup> Avenue North One-Way Couplet		19.4/B	0.77	98.9/F	1.26	No	No	No operational benefit			
	3B	Extend Exposition Drive to I-90 with New Interchange		51.3/D	0.97	91.8/F	1.20	No	No	No operational benefit			
	3C	New Connection Through MetraPark		23.4/C	0.60	25.4/C	0.62	Yes	No	Enhances operations with high cost of complex roadway projects on MetraPark property			
Alternative Intersections and Grade Separation	4A	Displaced Left-Turn Intersection (Southbound Left-Turn Lane)	Expo/1st Ave	10.3/B	0.57 <sup>4</sup>	10.3/B	0.82 <sup>4</sup>	Yes	Yes	Enhances operations. Expo/3 <sup>rd</sup> Avenue intersection would continue to restrict eastbound left-turns.			
			Expo/3rd Ave	12.2/B		13.8/B							
	4B	Restricted Crossing U-Turn Intersection (Westbound Left-Turn Lane)	Expo/1 <sup>st</sup> Ave	10.8/B <sup>5</sup>	0.66 <sup>4</sup>	20.6/C <sup>5</sup>	0.80 <sup>4</sup>	Yes	No		Enhances operations. Expo/3 <sup>rd</sup> Avenue intersection would continue to restrict eastbound left-turns. Concerns about heavy vehicles making u-turn movement.		
			Expo/3 <sup>rd</sup> Ave	8.7/A <sup>5</sup>		4.7/A <sup>5</sup>							
4C	Grade Separated Overpass for Northbound-Through Lanes		13.5/B <sup>5</sup>	0.58	18.3/B <sup>5</sup>	0.51	Yes	No	Enhances operations with high cost and other potential impacts due to grade-separation				
4D	Grade Separated Trumpet Interchange		B	0.40	B	0.29	Yes	No	Enhances operations with high cost and other potential impacts due to grade-separation				

<sup>1</sup>Level of Service – Indicates the average level of vehicle delay at an intersection. Calculated with HCM 6<sup>th</sup> Edition Methodology.

<sup>2</sup>Volume-to-Capacity Ratio - Represents the sufficiency of an intersection to accommodate vehicular demand (>1 indicates that an intersection is over-capacity). Calculated with HCM 2000 methodology.

<sup>3</sup>SIDRA 7 software used for roundabout results. Volume-to-capacity results reflect worst movement for roundabout alternatives.

<sup>4</sup>Capacity Analysis for Planning of Junctions (CAP-X) Tool results.

<sup>5</sup>HCM 2000 Results.

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Figure 1A

**No-Build**

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Convert existing westbound left-turn lane to a shared left/right-turn lane. Remove existing island for westbound right-turn.

**OR**

Convert existing westbound left-turn lane to a right-turn lane. Remove existing island for westbound right-turn.

Figure 1B



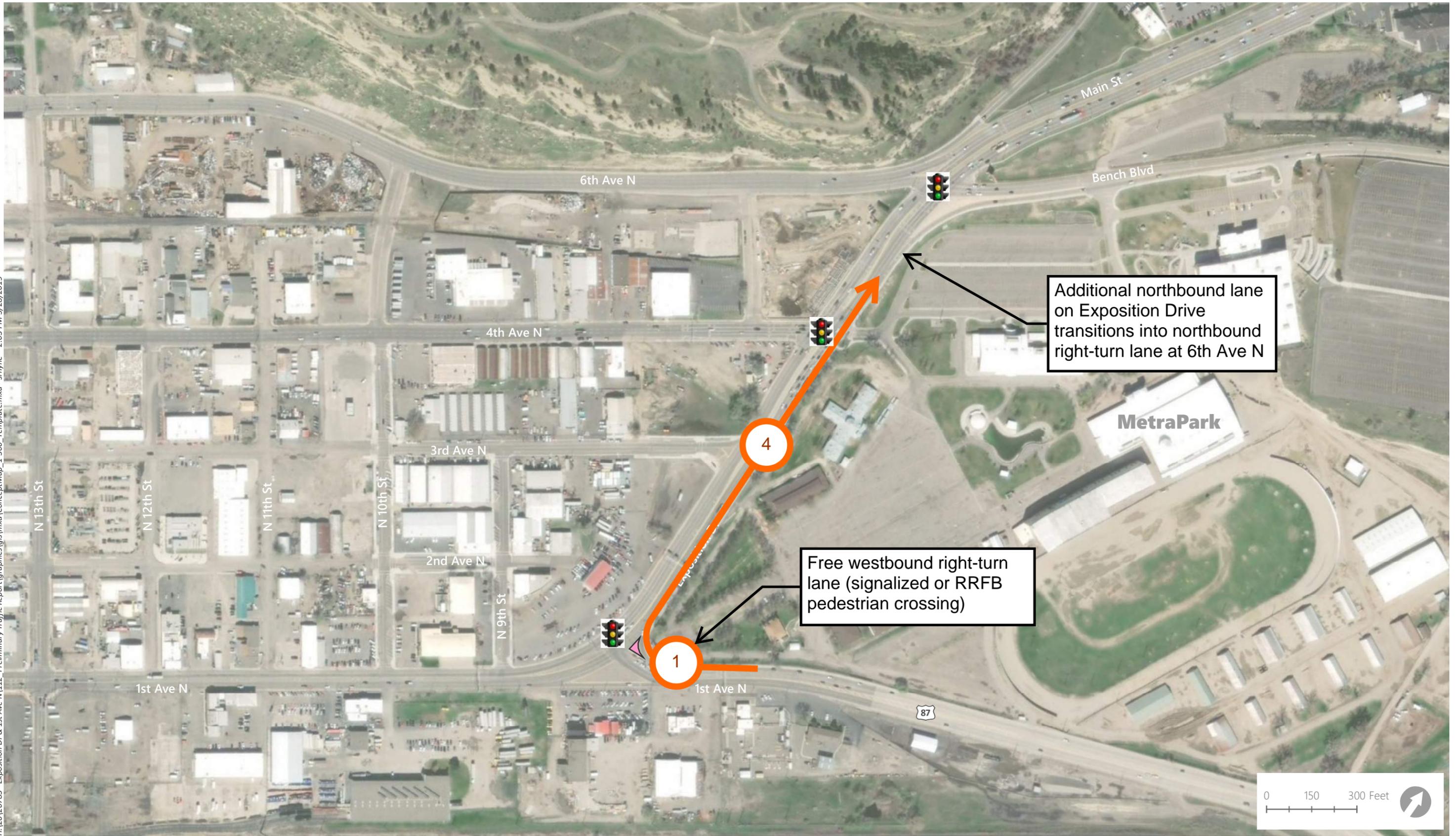
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Movement Number of Lanes

**Westbound Shared Left/Right-Turn Lane or Single Westbound Left-Turn Lane and Dual Westbound Right-Turn Lanes**

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Movement Number of Lanes

Free Westbound Right-Turn Lane Plus 4th Northbound Through Lane

Figure 1C

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Movement Number of Lanes

Figure 1D

### Dual Westbound Right-Turn Lanes

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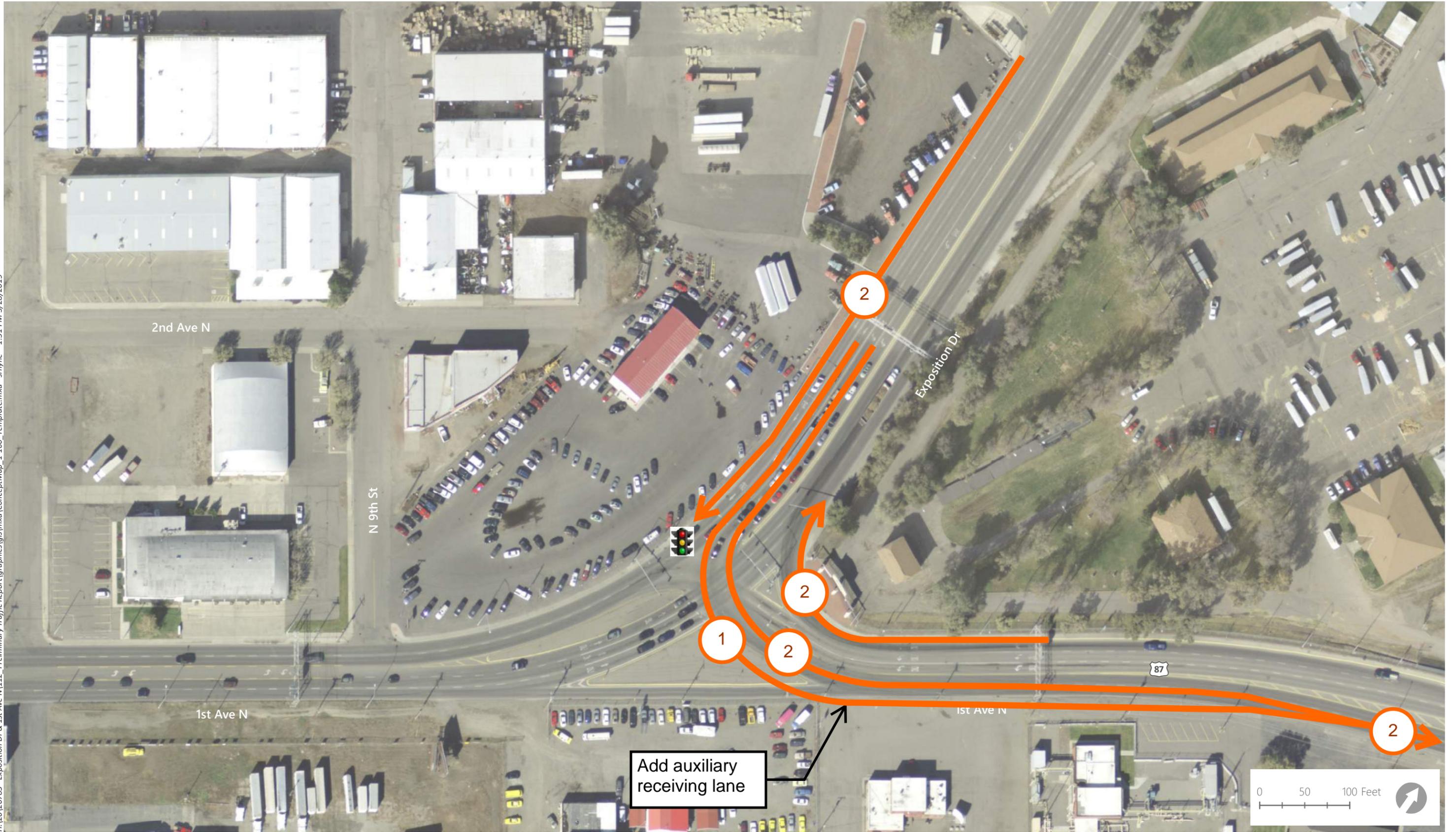


Movement Number of Lanes

Figure 1E

### Triple Southbound Left-Turn Lanes

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Movement Number of Lanes

### Triple Southbound Left-Turn Lanes and Dual Westbound Right-Turn Lanes

Figure 1F

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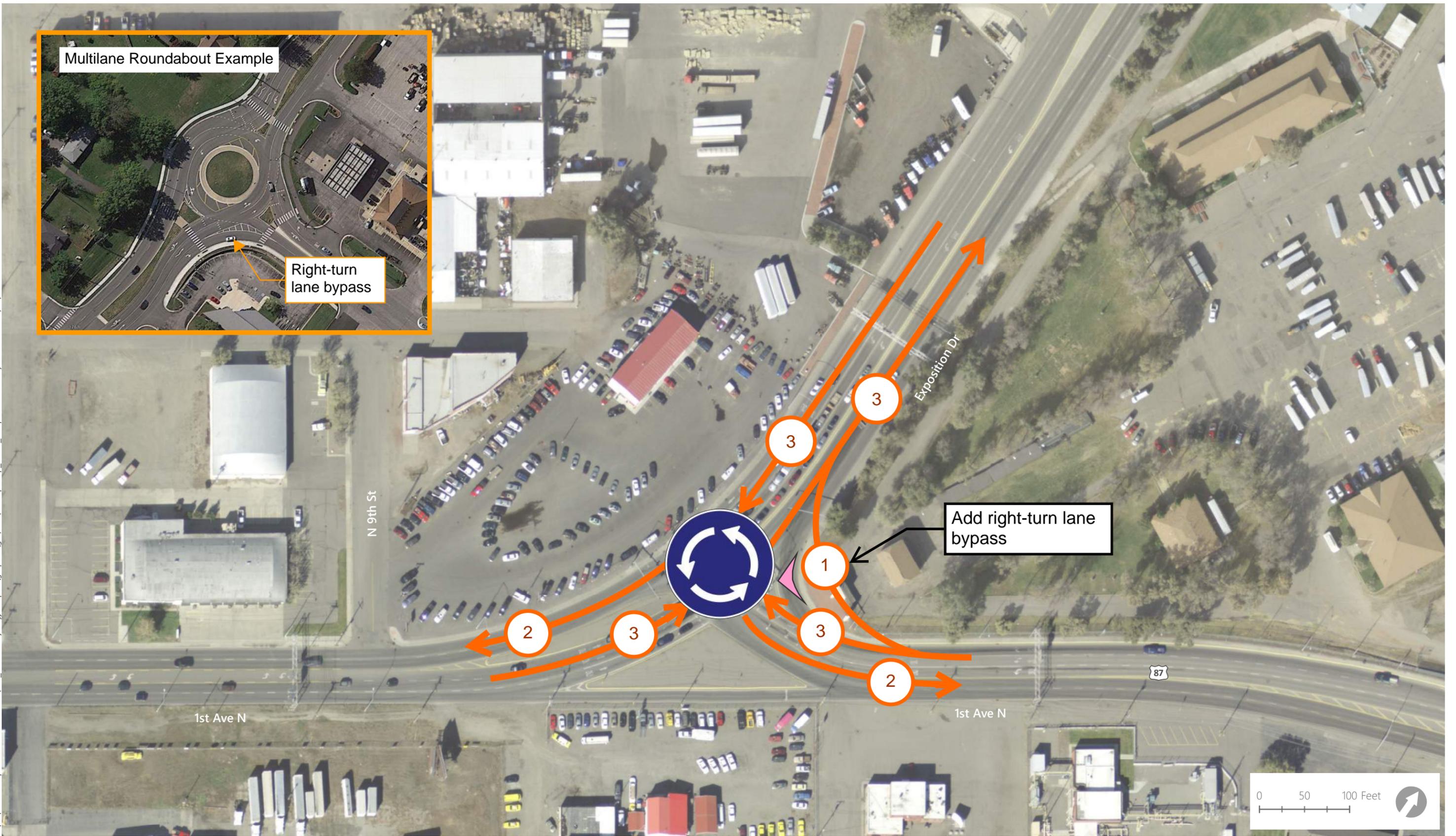
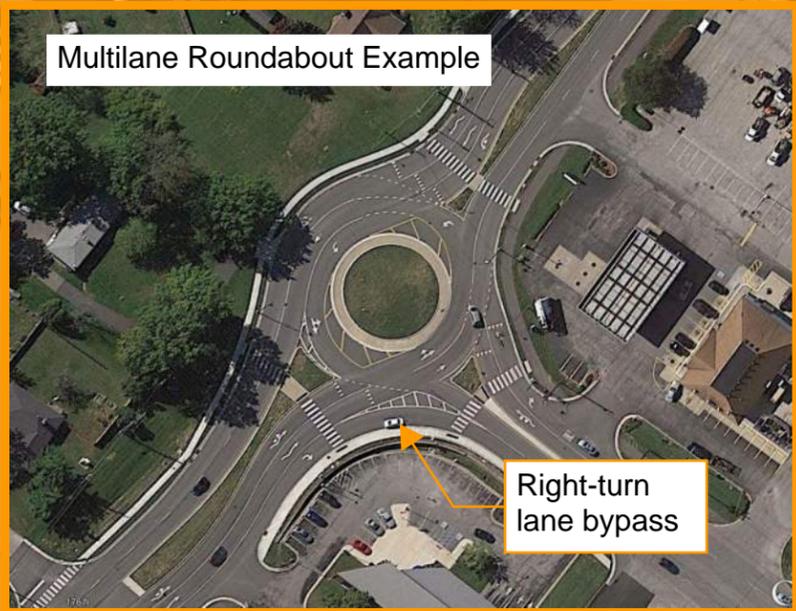


 Multilane Roundabout

 Movement Number of Lanes

Figure 2A  
**Multilane Roundabout (Three Circulatory Lanes)**

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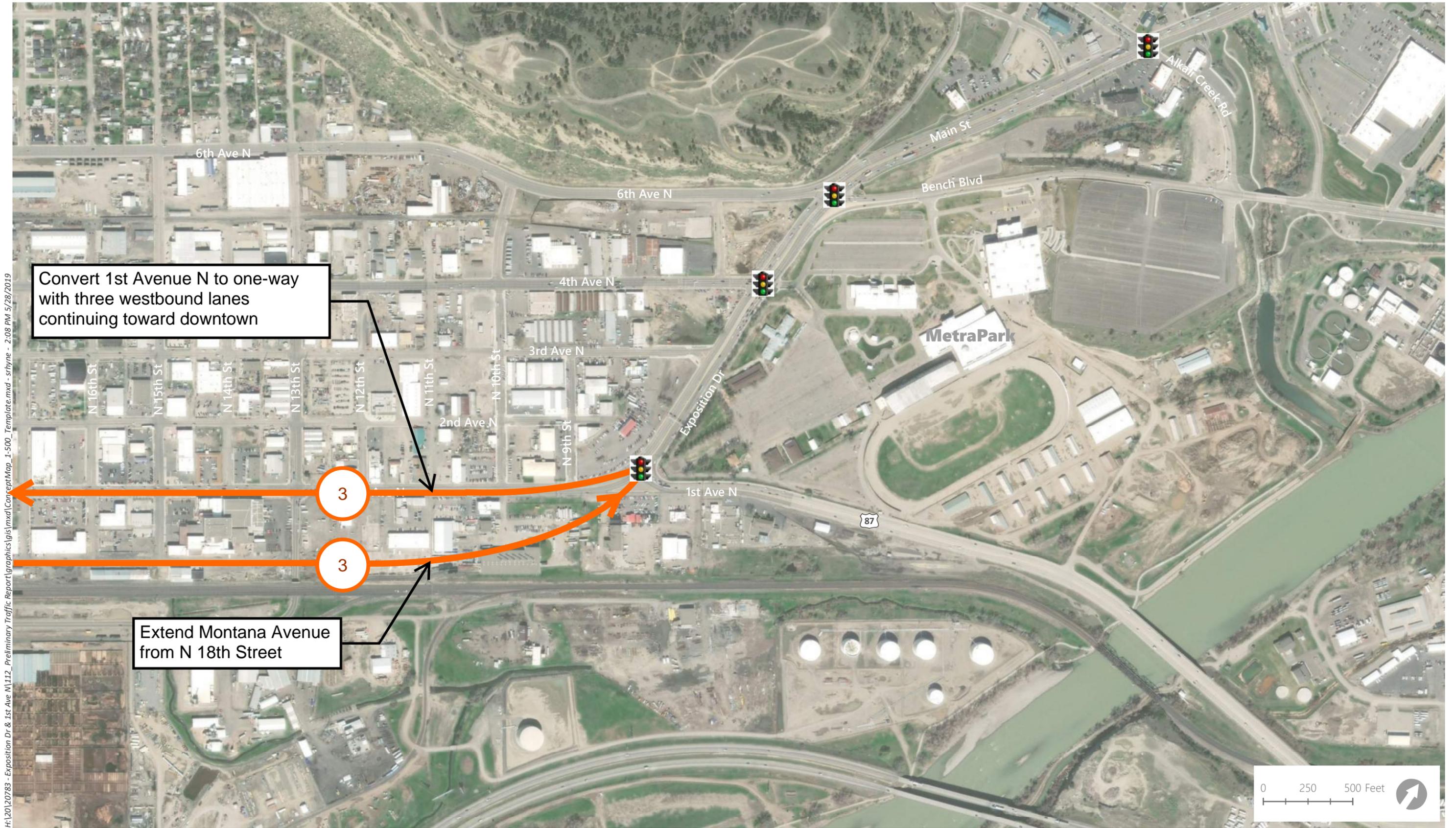
Multilane Roundabout



Movement Number of Lanes

Multilane Roundabout (Three Circulatory Lanes) With Westbound Right-Turn Lane Bypass

Figure 2B



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Convert 1st Avenue N to one-way with three westbound lanes continuing toward downtown

Extend Montana Avenue from N 18th Street



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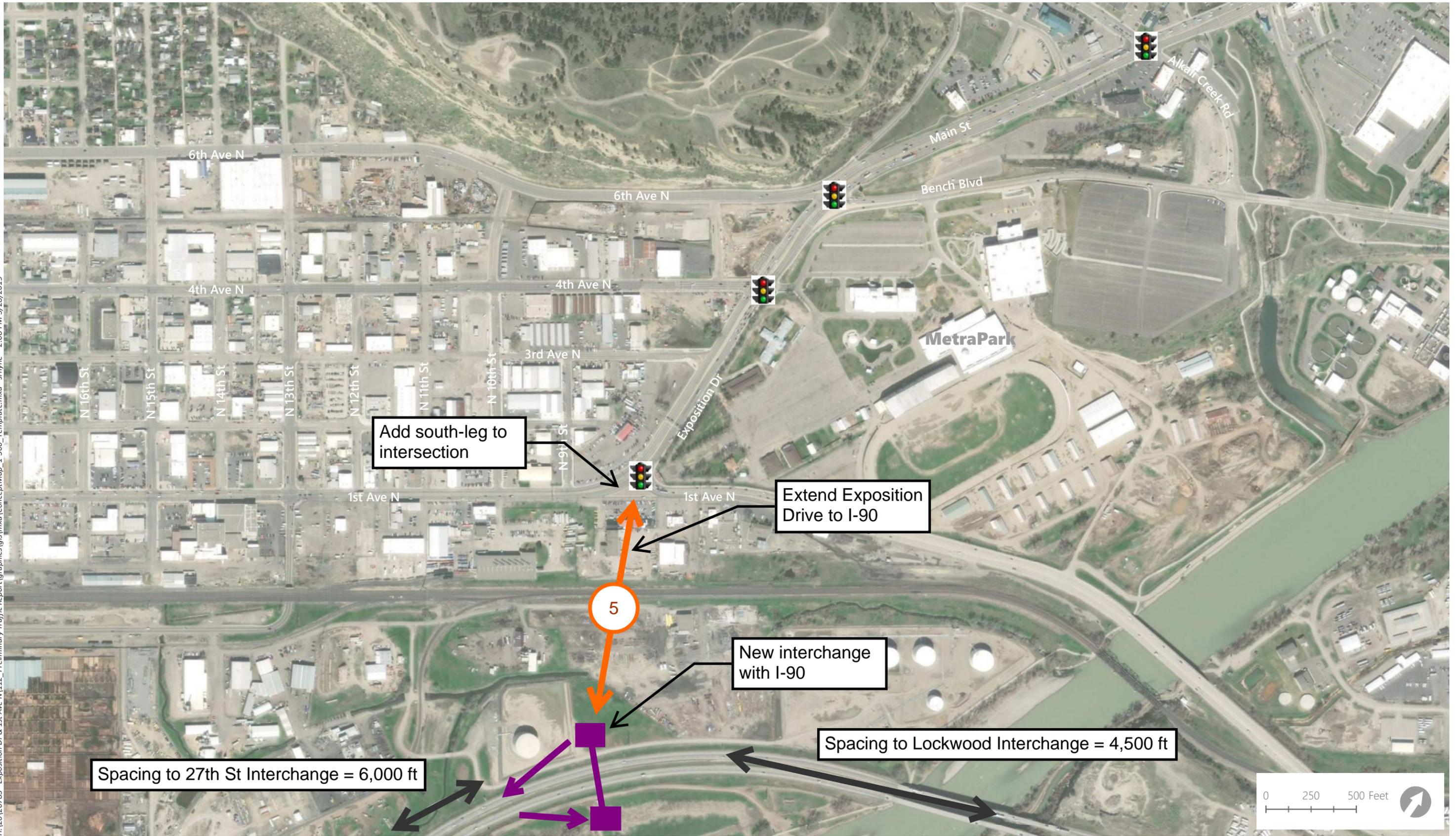


Movement Number of Lanes

Figure 3A

**Extend Montana Avenue/1st Avenue N One-Way Couplet**

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Movement Number of Lanes



Grade-Separated Lanes

Figure 3B

**Extend Exposition Drive to I-90 with New Interchange**

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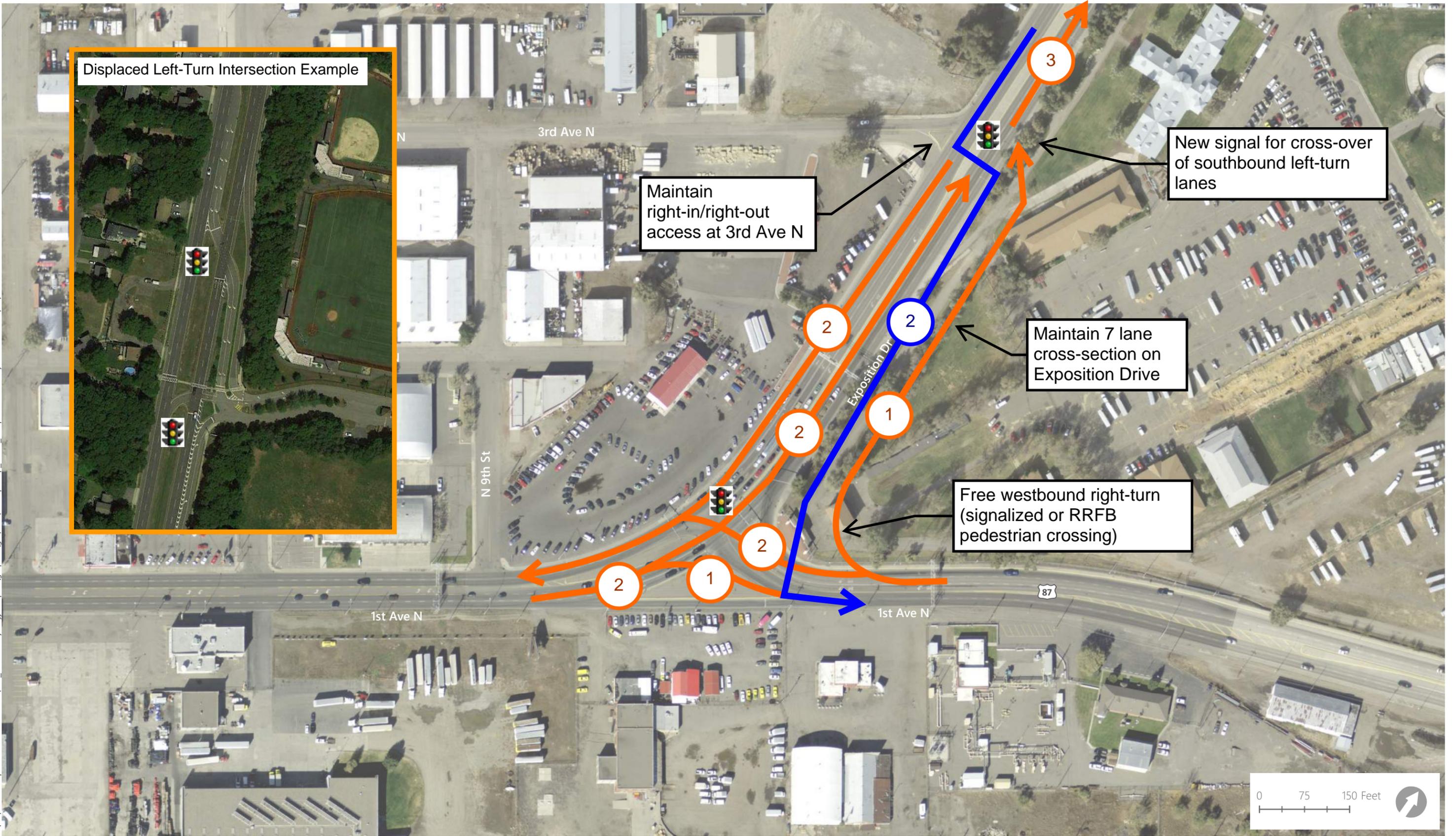
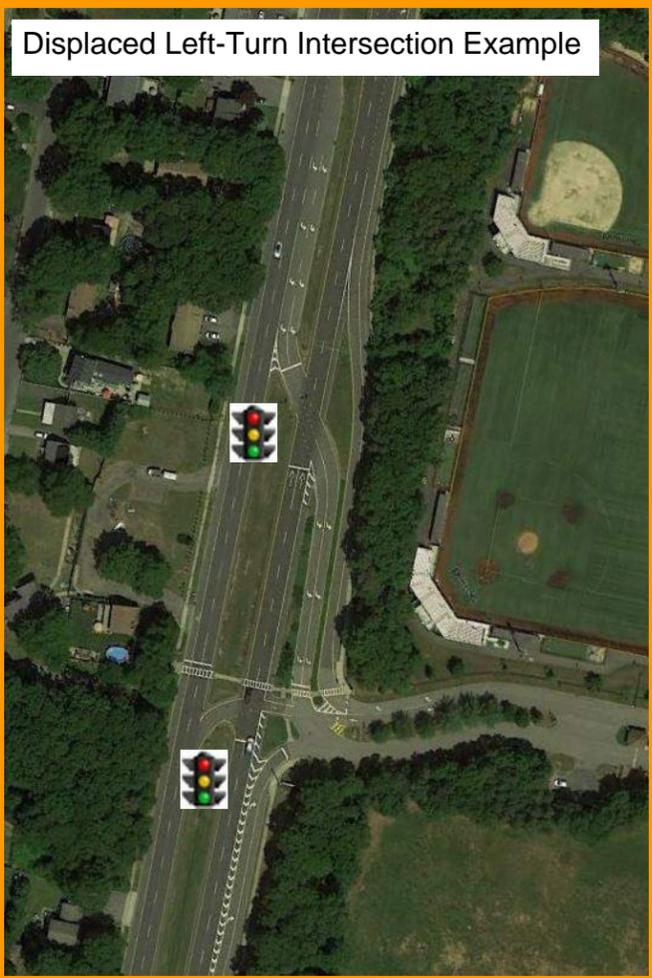


Movement Number of Lanes

Figure 3C

New Connection through MetraPark

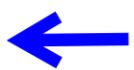
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Movement Number of Lanes

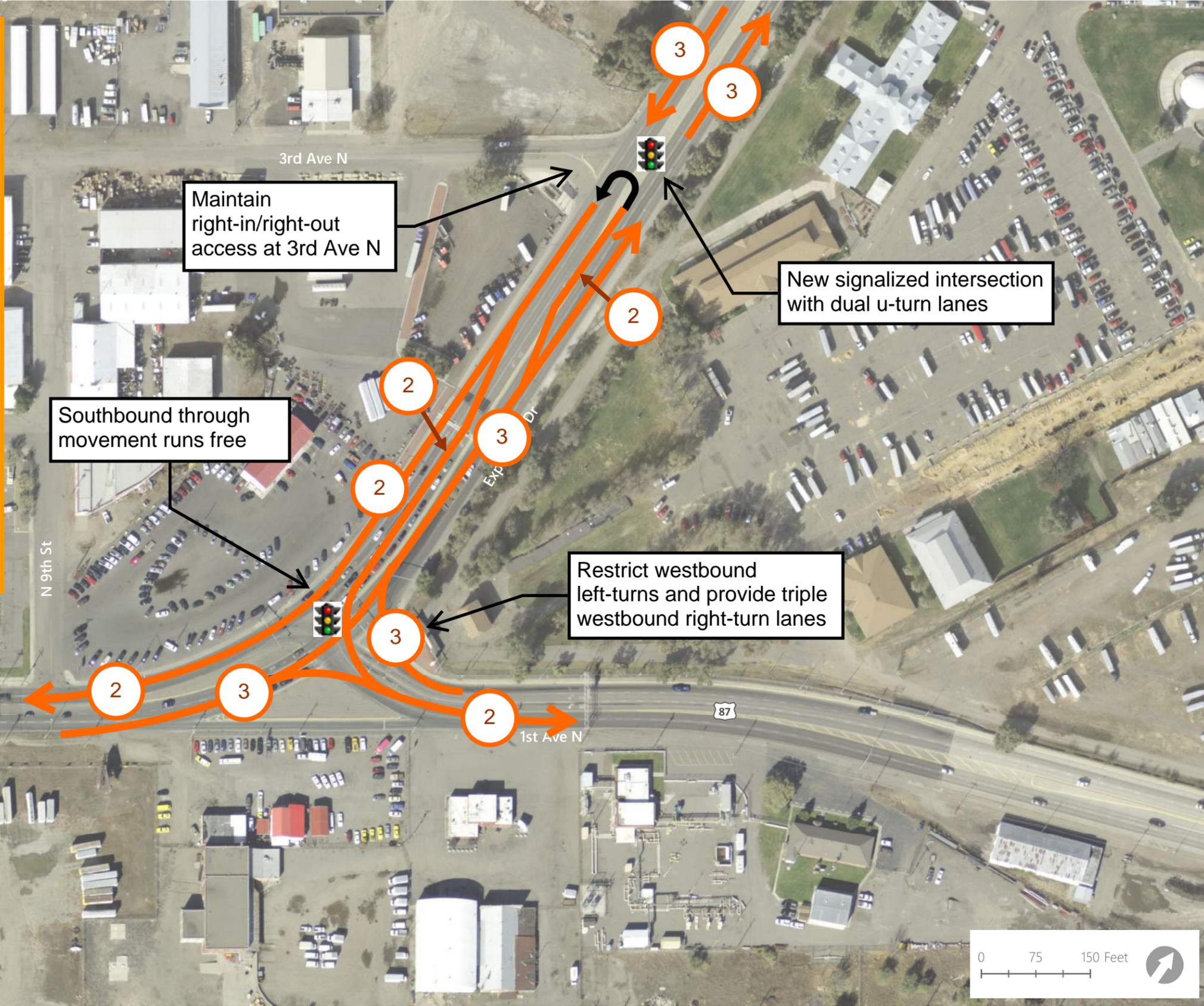


Displaced Left-Turn Movement

Displaced Left-Turn Intersection (Southbound Left-Turn Lane)

Figure 4A

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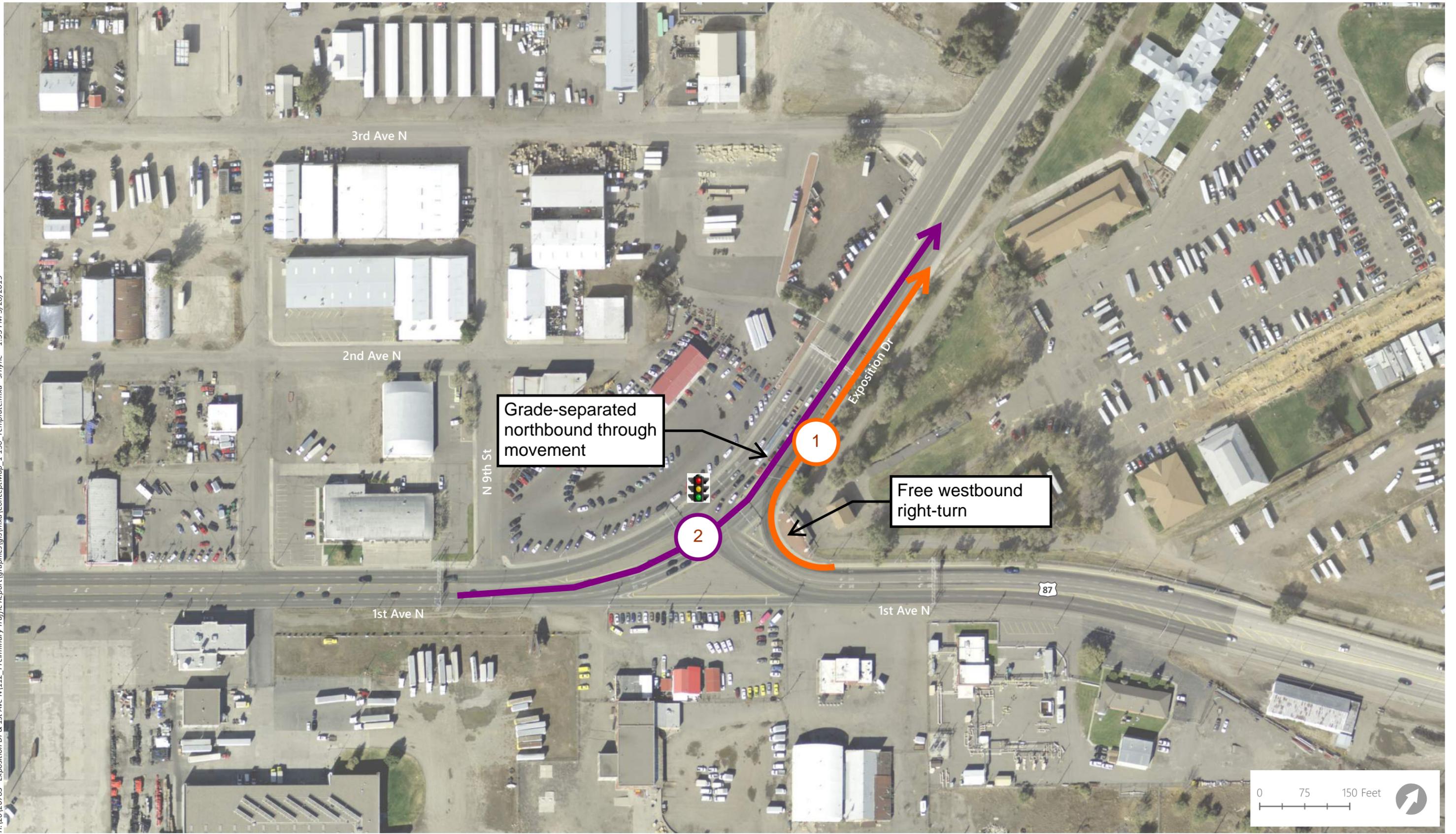
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Movement Number of Lanes

Figure 4B

Restricted Crossing U-Turn Intersection (Westbound Left-Turn Lane)

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Movement Number of Lanes

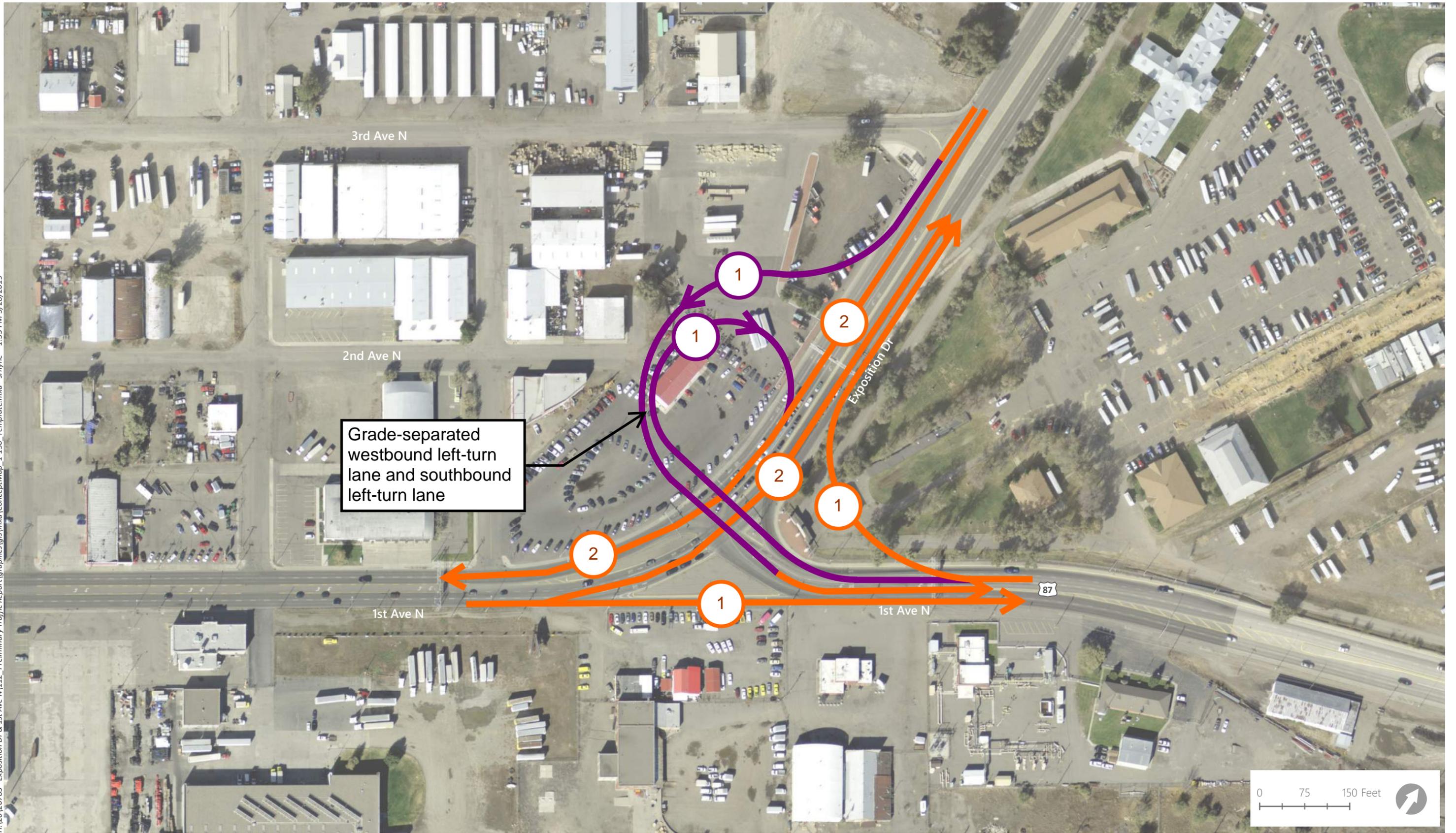


Grade-Separated Lanes

**Grade-Separated Overpass for Northbound Through Lanes**

Figure 4C

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Grade-separated westbound left-turn lane and southbound left-turn lane



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Movement Number of Lanes



Grade-Separated Lanes

Figure 4D

### Grade-Separated Trumpet Interchange