

PARSONS

Clear Path 465

I-465/I-69 Interchange Modification and ATL Project Update

Indiana Department of Transportation

Des. 1400075

Agenda

- Project Overview
- Existing Traffic Operations
- Alternative Analysis
- Recommended Alternative
- Proposed Traffic Operations
- Questions

Project Overview - Location Map



Project Overview – Existing I-465/I-69 Interchange



Project Overview - Purpose and Need

The project need stems from:

- ***Congestion***

- Insufficient capacity for existing and future (2040) traffic volumes along critical roadway segments within the Project Area resulting in significant congestion issues.

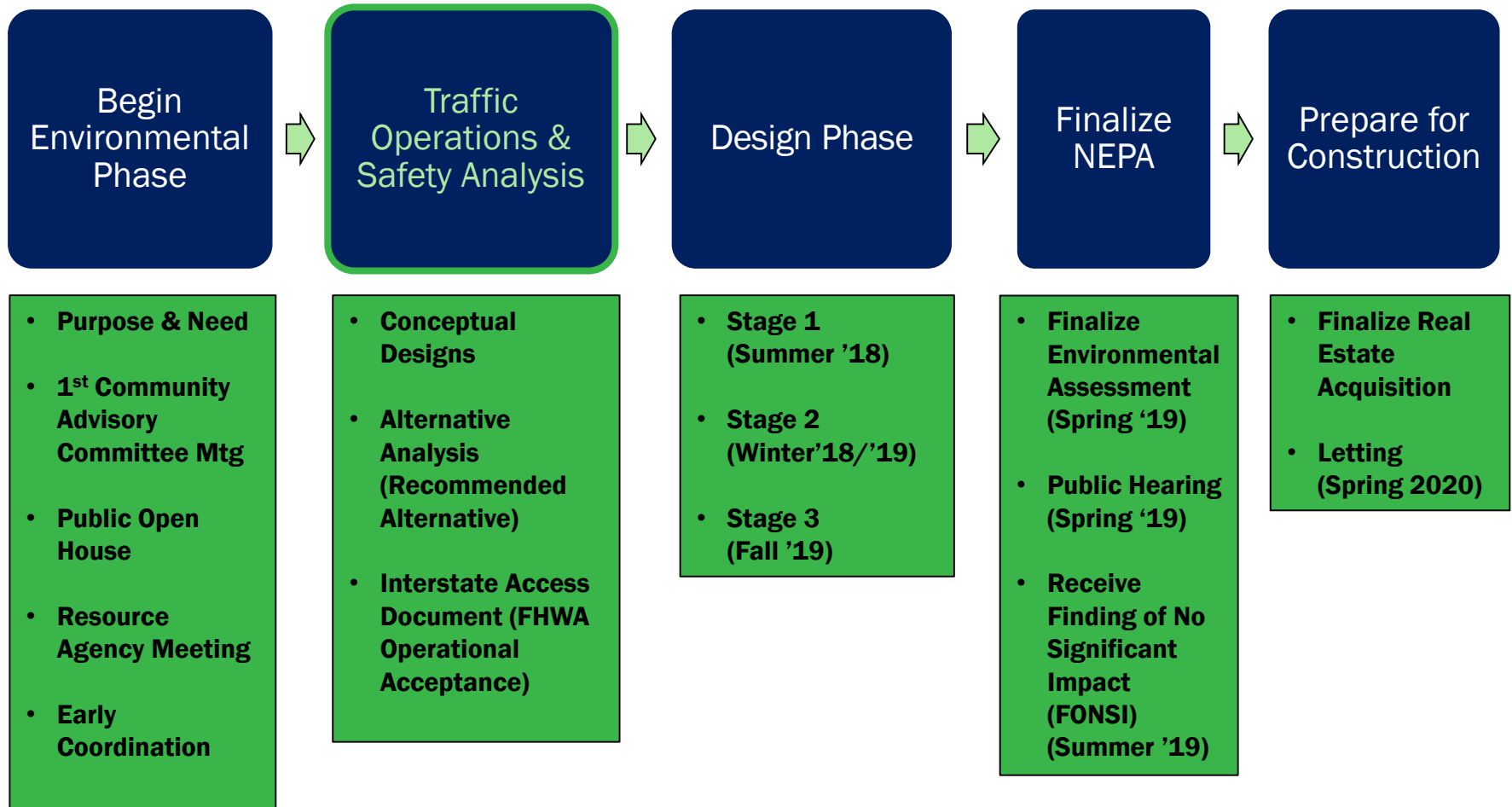
- ***Safety***

- Between 2013 and 2015, over 1,000 crashes were reported within the Project Area – an average of almost 1 crash per day.
- Causes: Not enough lanes, weaving movements (system & local movements)

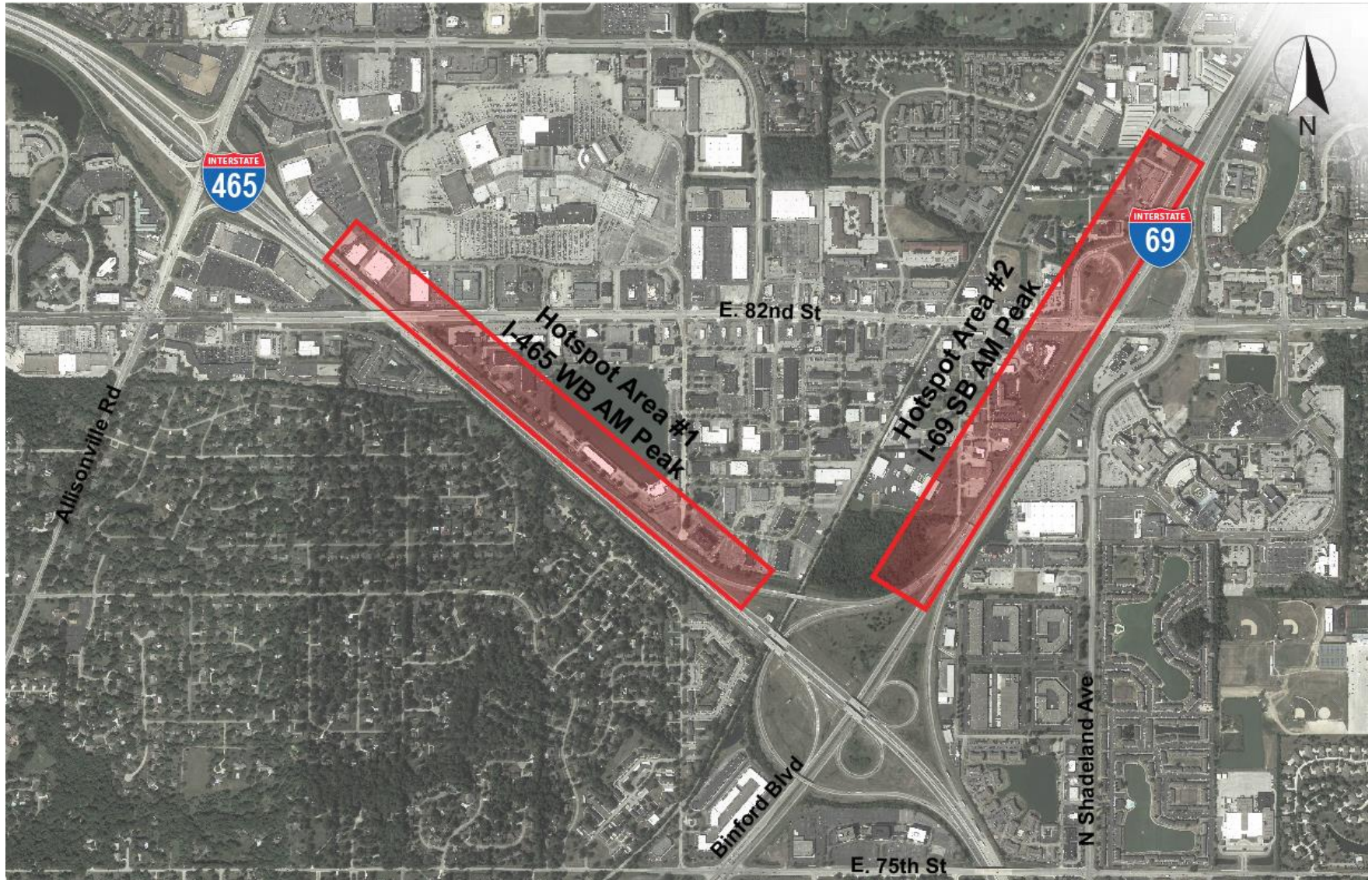
The ***Purpose*** of the Project is to:

- Improve overall traffic operations by increasing capacity to meet LOS goals for each movement.
- Improve safety
 - Reduce total number of crashes and crash rates (crashes/mile/year)
 - Decrease the fatality / injury severity percentages

Project Overview – Project Development Process



Existing Traffic Operations – AM Peak “Hot Spots”



Existing Traffic Operations

AM Peak "Hot Spot" #1 (WB I-465)



Existing Traffic Operations

AM Peak “Hot Spot” #1 (WB I-465)

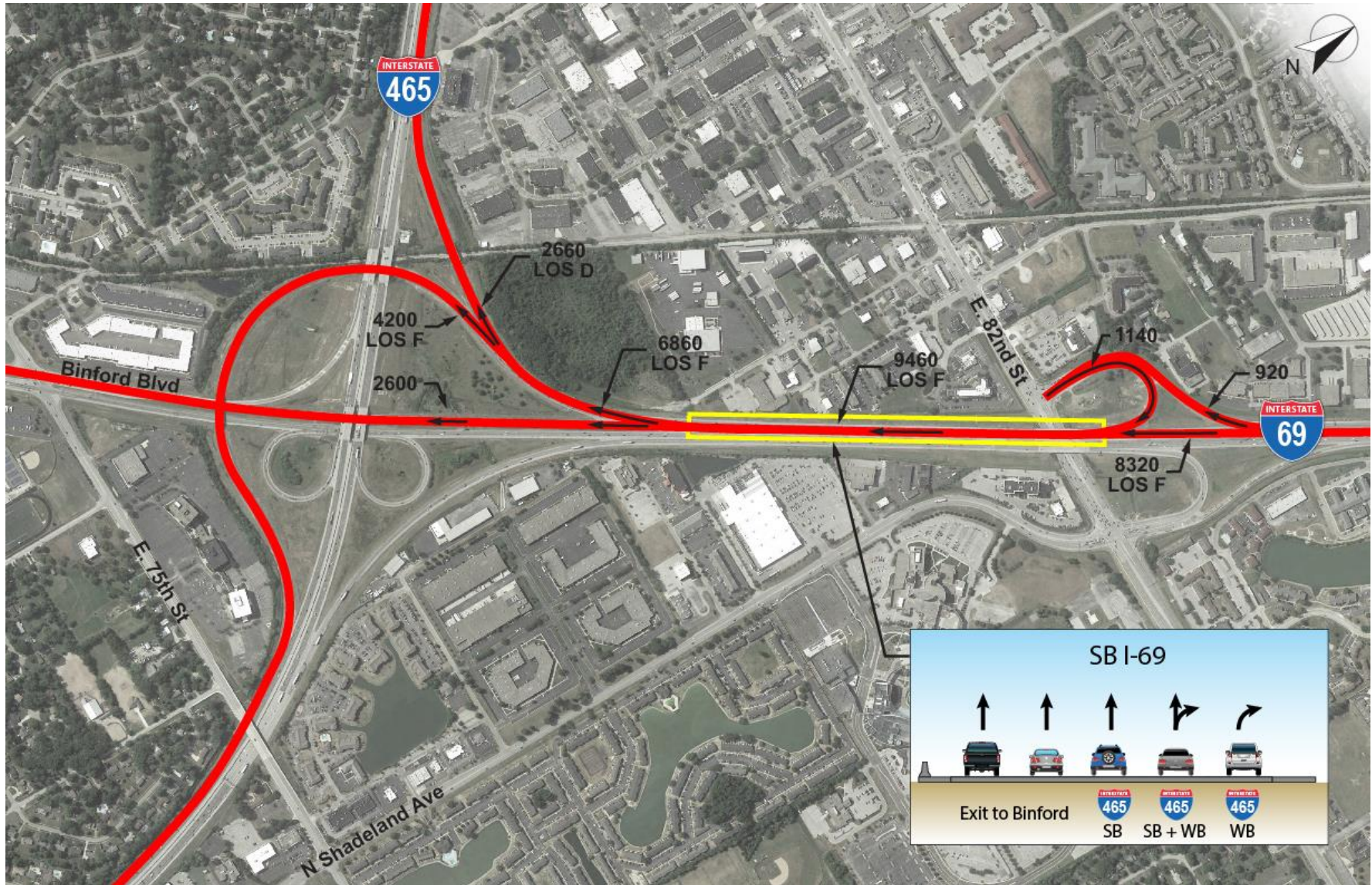
No-Build - AM

Route	Segment	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	Peak-Hour Average	Speed (mph)
NB/WB I-465	56th St On to NB to NB Ramp	60	38	22	16	16	16	22	26	17	>60
		64	40	34	34	34	34	32	31	34	60
		65	55	53	54	54	54	53	52	54	58
		65	56	55	55	55	55	55	52	55	55
		65	56	54	55	54	53	54	50	54	53
	NB to NB thru NB to WB	67	59	58	53	40	40	45	39	48	50
	NB to WB Ramp to SB to WB Ramp	63	57	49	34	31	31	32	26	36	
		66	54	36	26	28	28	29	23	30	
	I-69 to Allisonville Rd	62	46	29	20	22	23	23	20	23	
		64	51	45	45	46	46	45	45	45	
	at Allisonville Rd	64	55	52	52	52	52	52	53	52	
		64	57	54	54	54	54	54	55	54	
		64	57	55	55	55	55	55	55	55	
	Allisonville On to Keystone Off	64	60	58	58	58	58	58	58	58	
		65	61	60	60	60	60	60	60	60	

- Shockwaves propagate back from weave to Allisonville Road
- Secondary Bottleneck at 56th/Shadeland On-Ramp

Existing Traffic Operations

AM Peak "Hot Spot" #2 (SB I-69)



Existing Traffic Operations

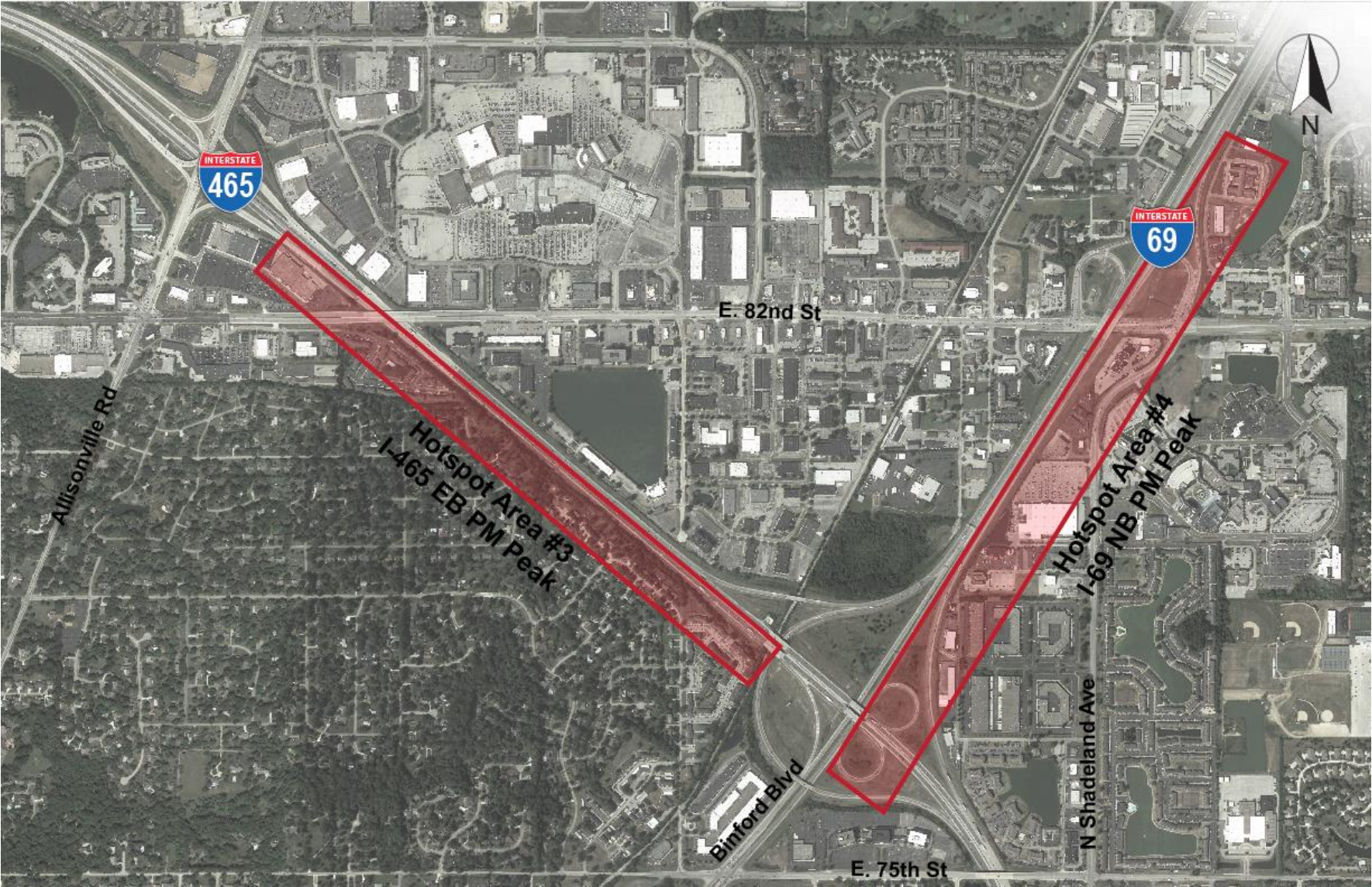
AM Peak “Hot Spot” #2 (SB I-69)

No-Build - AM

Route	Segment	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	Peak-Hour Average	Speed (mph)
SB I-69	106th	64	64	63	63	60	43	36	36	57	>60
		63	62	61	58	24	13	12	13	39	60
	106th On to 96th Off	62	61	59	51	19	14	15	16	36	58
		63	62	61	43	19	15	16	17	34	55
		61	61	60	35	20	16	17	19	33	53
	96th	63	62	61	28	18	15	16	18	30	50
		63	62	61	24	18	16	16	18	29	
		63	62	58	22	17	16	16	18	28	
	96th On to 82nd Off	64	63	50	19	16	15	14	16	25	
		59	56	35	22	19	17	17	19	23	
		59	52	28	24	20	18	19	20	22	
	82nd St	58	45	24	22	18	17	18	19	20	
	82nd On to I-465 Split	48	30	25	23	19	18	18	19	21	
		50	43	42	39	28	26	25	28	34	
		51	50	50	45	30	28	28	31	38	
		54	52	51	42	24	24	24	26	35	

- Bottleneck at 82nd Street weave builds back north
- WB I-465 bottleneck spills back into this area during peak hour

Existing Traffic Operations – PM Peak “Hot Spots”



Existing Traffic Operations PM Peak “Hot Spot” #3 (EB I-465)



Existing Traffic Operations

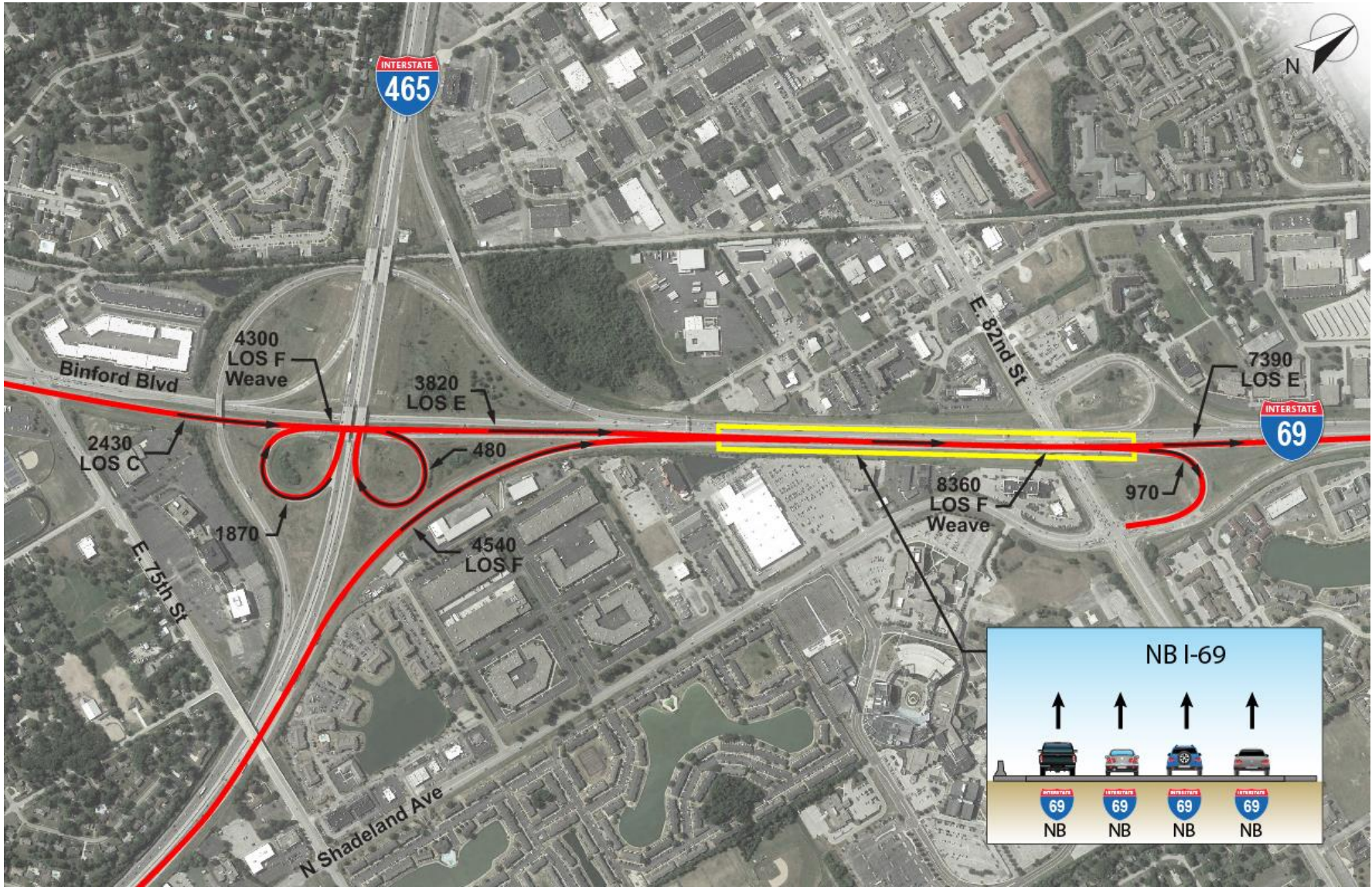
PM Peak “Hot Spot” #3 (EB I-465)

No-Build - PM

Route	Segment	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15	Peak-Hour Average	Speed (mph)
EB/SB I-465	Keystone On to Allisonville Off	60	55	45	36	30	24	20	18	34	>60
		65	39	26	25	24	24	25	25	25	60
	at Allisonville Rd	67	44	29	28	27	26	29	29	27	58
		68	43	29	29	28	28	30	30	28	55
		68	41	29	28	28	28	29	30	28	53
		69	38	28	27	27	26	29	30	27	50
	Allisonville to I-69	62	38	30	28	28	28	31	32	29	
		64	31	22	23	22	22	24	26	22	
		65	44	42	40	41	39	40	39	40	
	EB to SB Ramp to EB to NB Ramp	65	50	47	48	47	46	46	46	47	
		62	49	47	46	47	47	47	48	47	
		54	42	39	40	40	42	41	43	40	
	EB to NB Ramp to SB to SB Ramp	65	55	54	54	54	54	54	54	54	
	I-69 to 56th St Off	60	57	56	56	56	56	56	56	56	
		63	58	56	56	56	56	56	57	56	
		64	60	58	58	58	58	58	59	58	

- EB I-465 between Allisonville Road and I-69 Interchange
- Lasts throughout PM peak period

Existing Traffic Operations PM Peak "Hot Spot" #4 (NB I-69)



Existing Traffic Operations

PM Peak “Hot Spot” #4 (NB I-69)

No-Build - PM

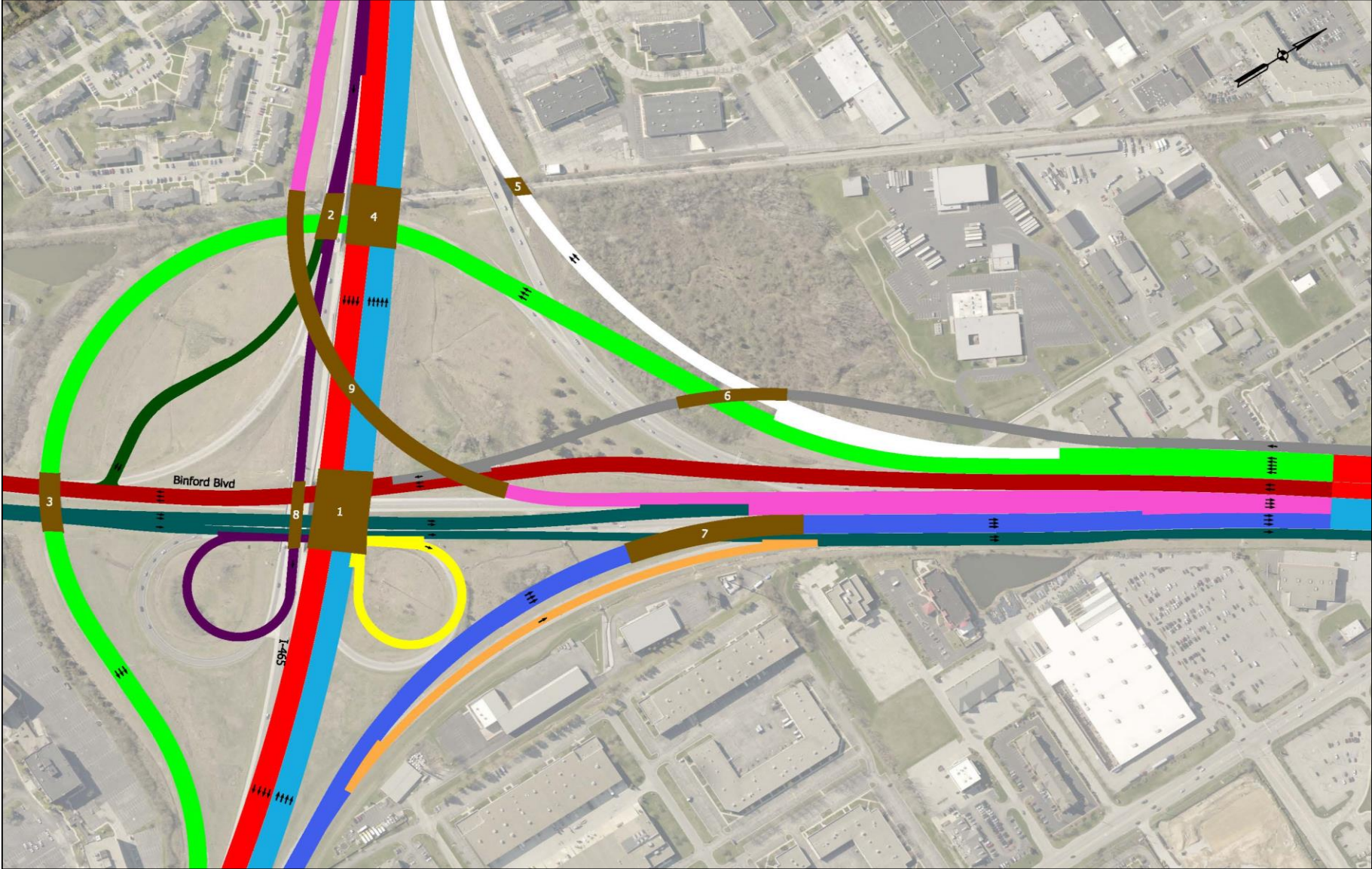
Route	Segment	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15	Peak-Hour Average	Speed (mph)	
NB I-69	NB Binford Blvd	57	55	54	54	54	54	55	56	54	>60	
		59	53	51	51	51	51	52	52	51	60	
	I-465 to 82nd St Off	64	58	57	57	57	57	57	57	57	58	
		62	54	55	53	54	54	55	56	54	55	
	at 82nd St	65	60	59	59	59	59	59	59	60	59	53
		64	61	60	60	60	60	60	60	60	60	50
	82nd St On to 96th St Off	64	59	58	57	57	58	58	58	58	57	
		65	62	62	61	61	61	62	62	62	61	
		65	62	62	61	61	61	62	61	61	61	
	at 96th St	66	63	63	62	62	63	63	63	63	62	
		66	64	63	63	63	63	63	63	63	63	
		66	64	63	63	63	63	63	63	63	63	
	96th St On to 106th St Off	66	64	63	63	63	63	63	63	63	63	
		66	64	63	63	63	63	63	63	63	63	
		65	62	61	61	61	61	61	61	61	61	
	at 106th St	66	64	63	63	63	63	63	63	63	63	
		67	65	65	65	65	65	65	65	65	65	

- NB I-69 between I-465 and 82nd Street
- Bottleneck is metered by WB I-465 bottleneck

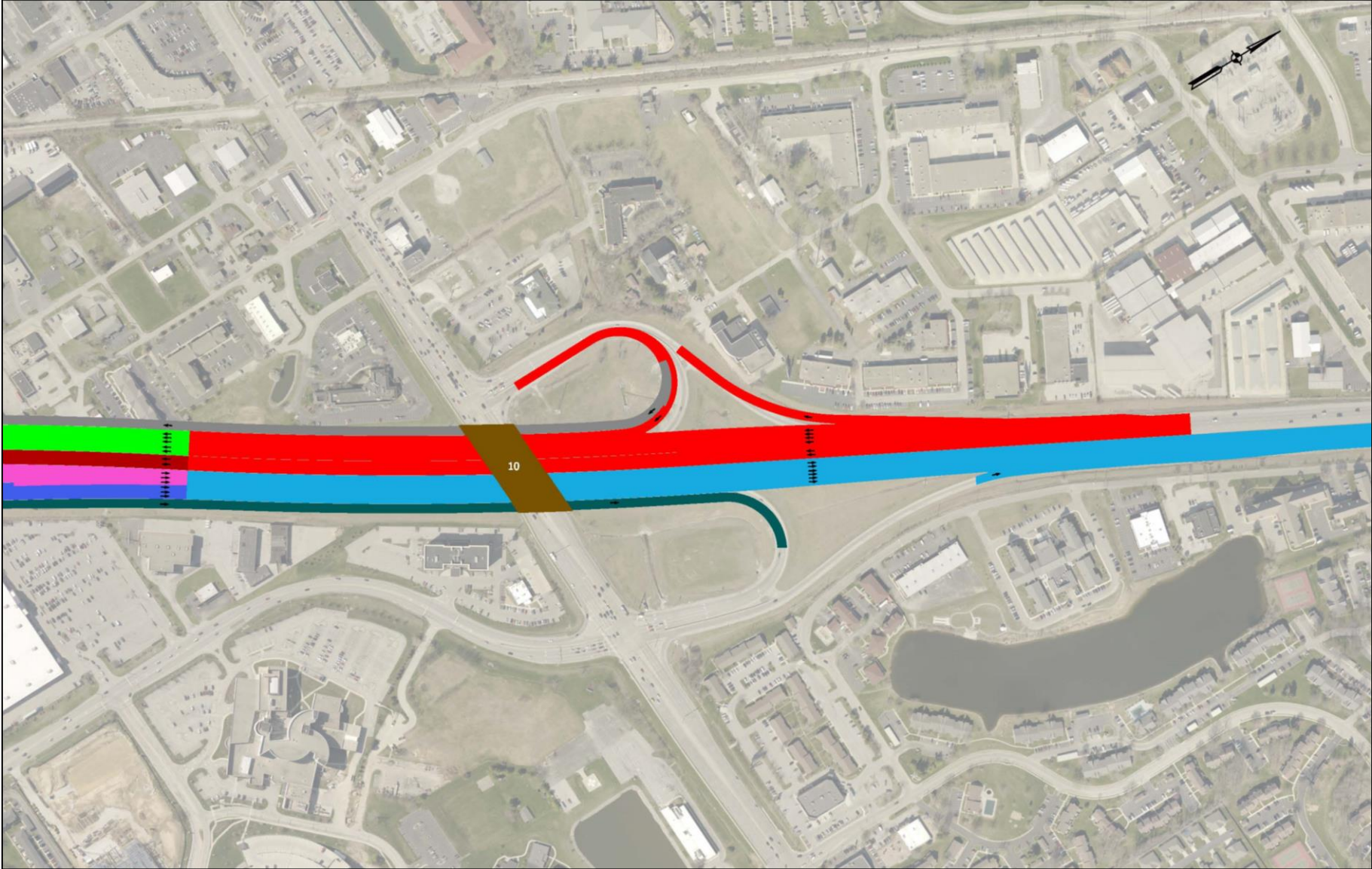
Alternative Analysis – I-465 Mainline (Off-Line)



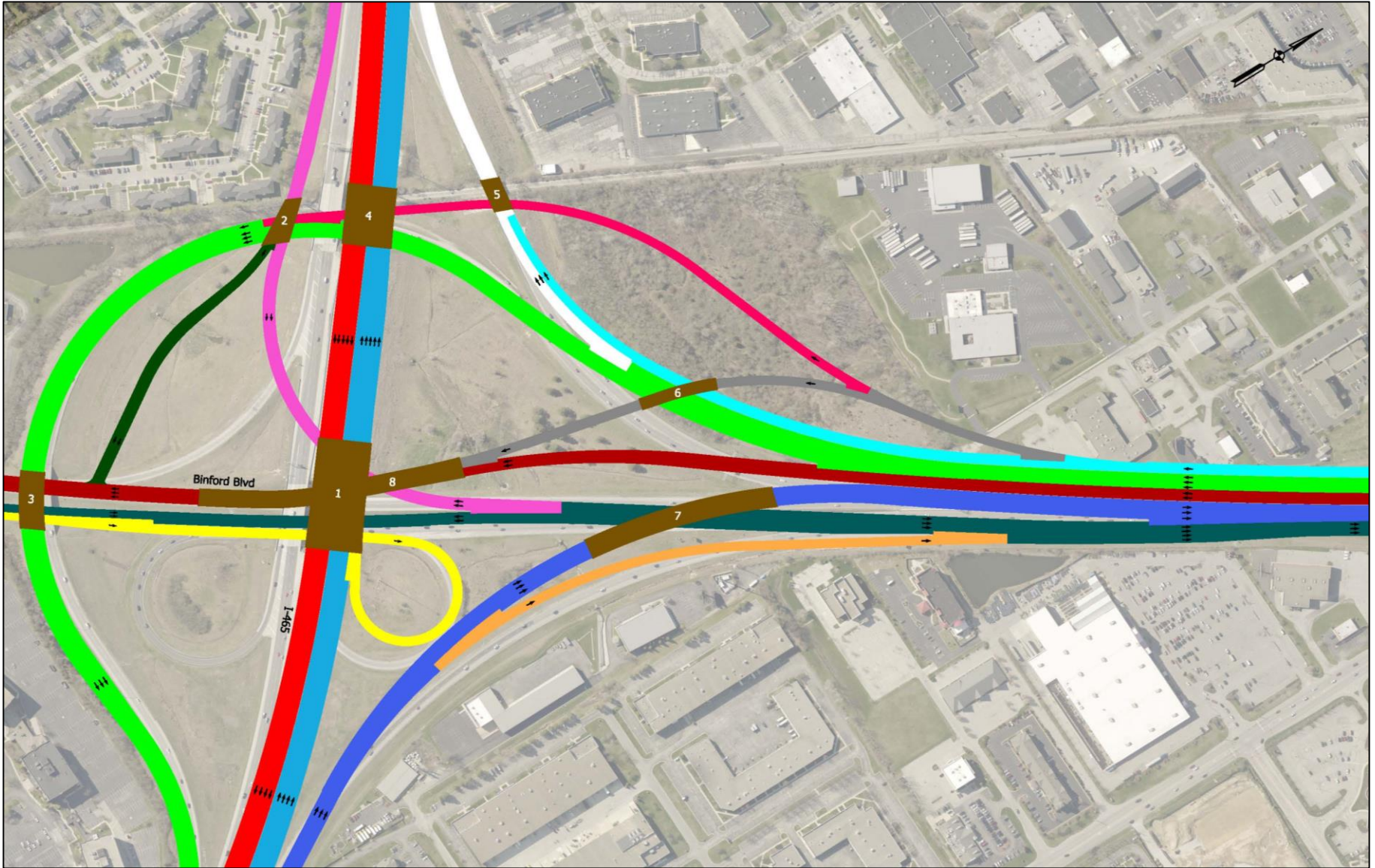
Build Alternative "A" Overview (I-465/I-69 Interchange)



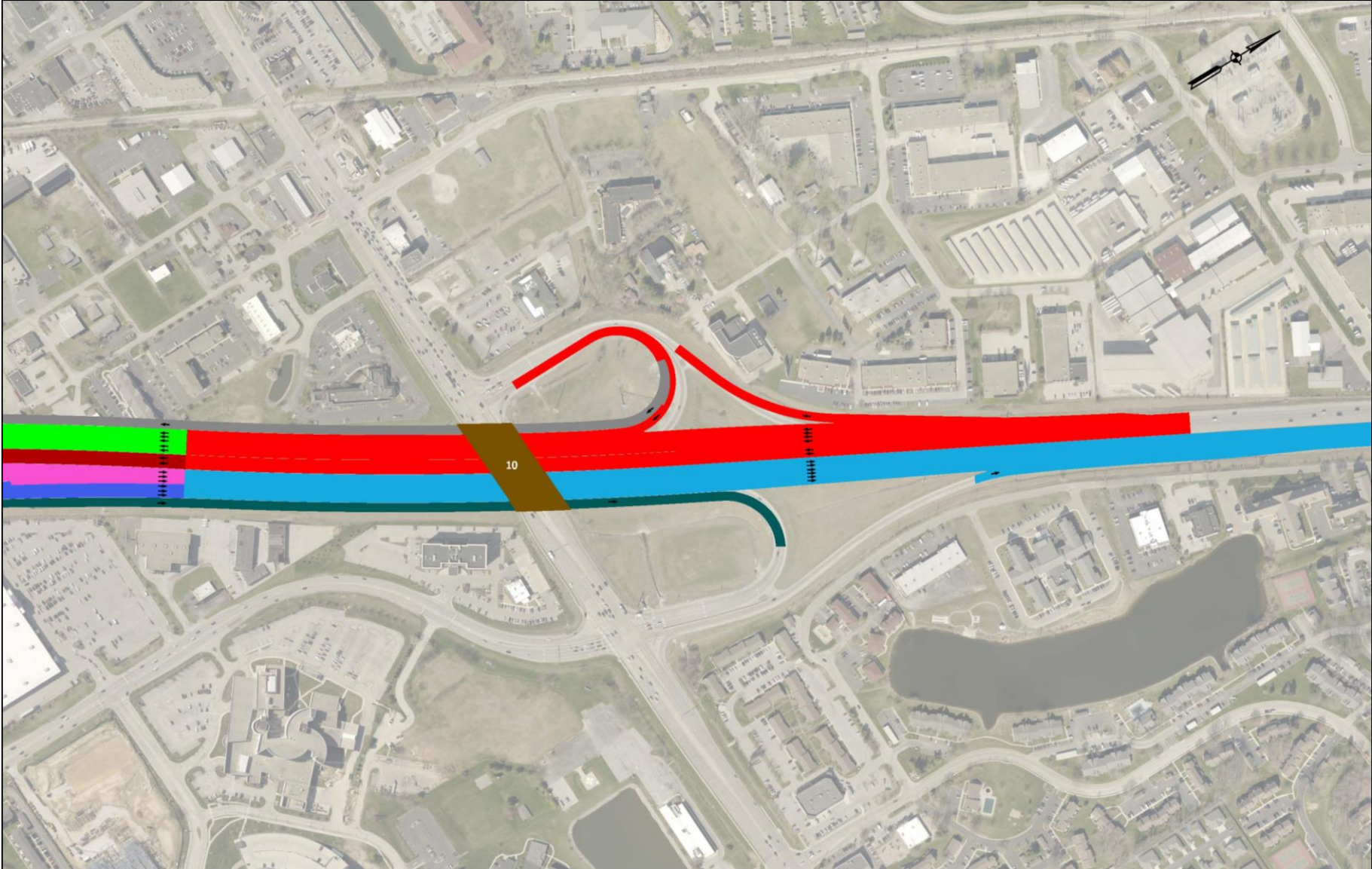
Build Alternative "A" Overview (I-69/82nd St Interchange)



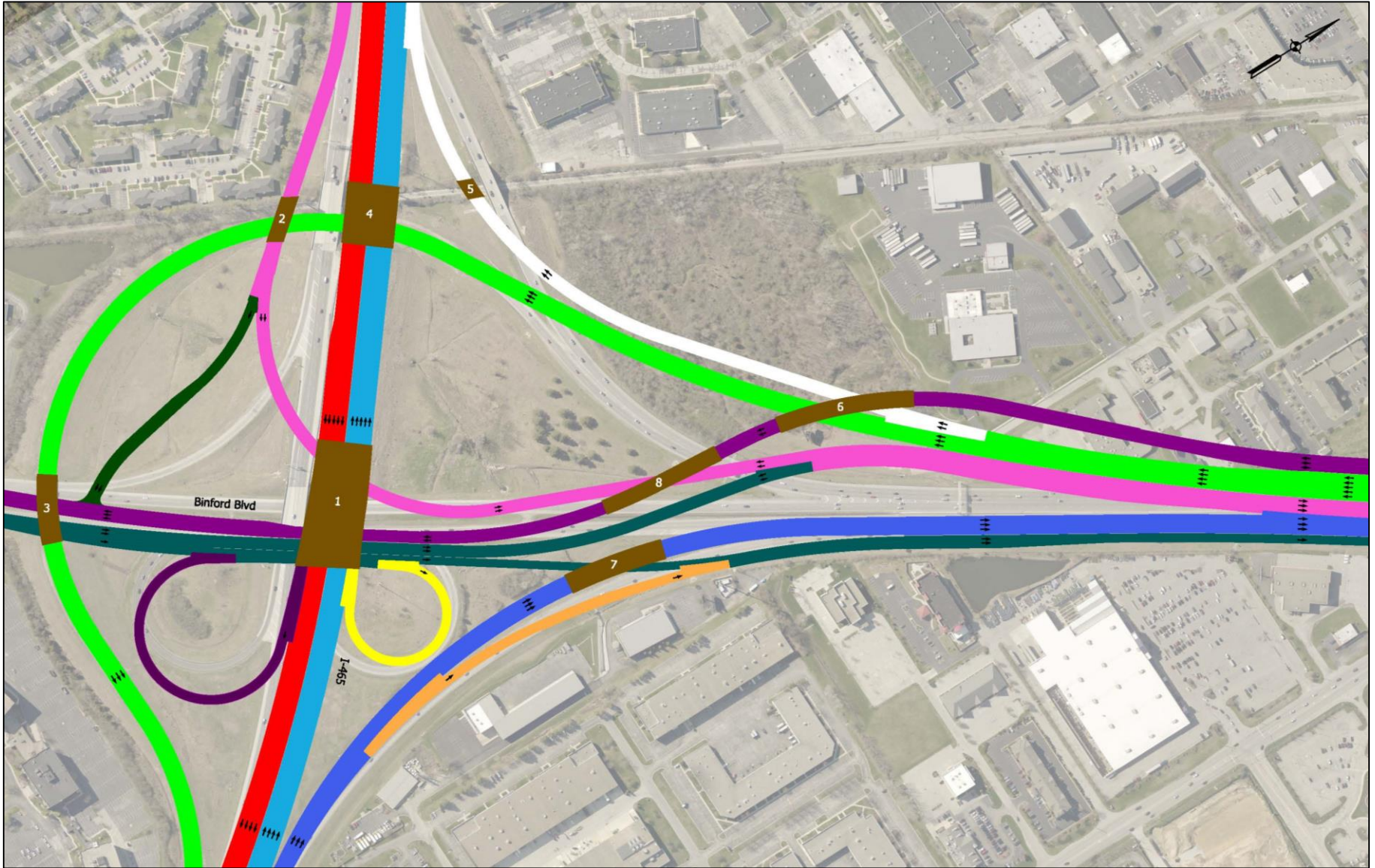
Build Alternative "B" Overview (I-465/I-69 Interchange)



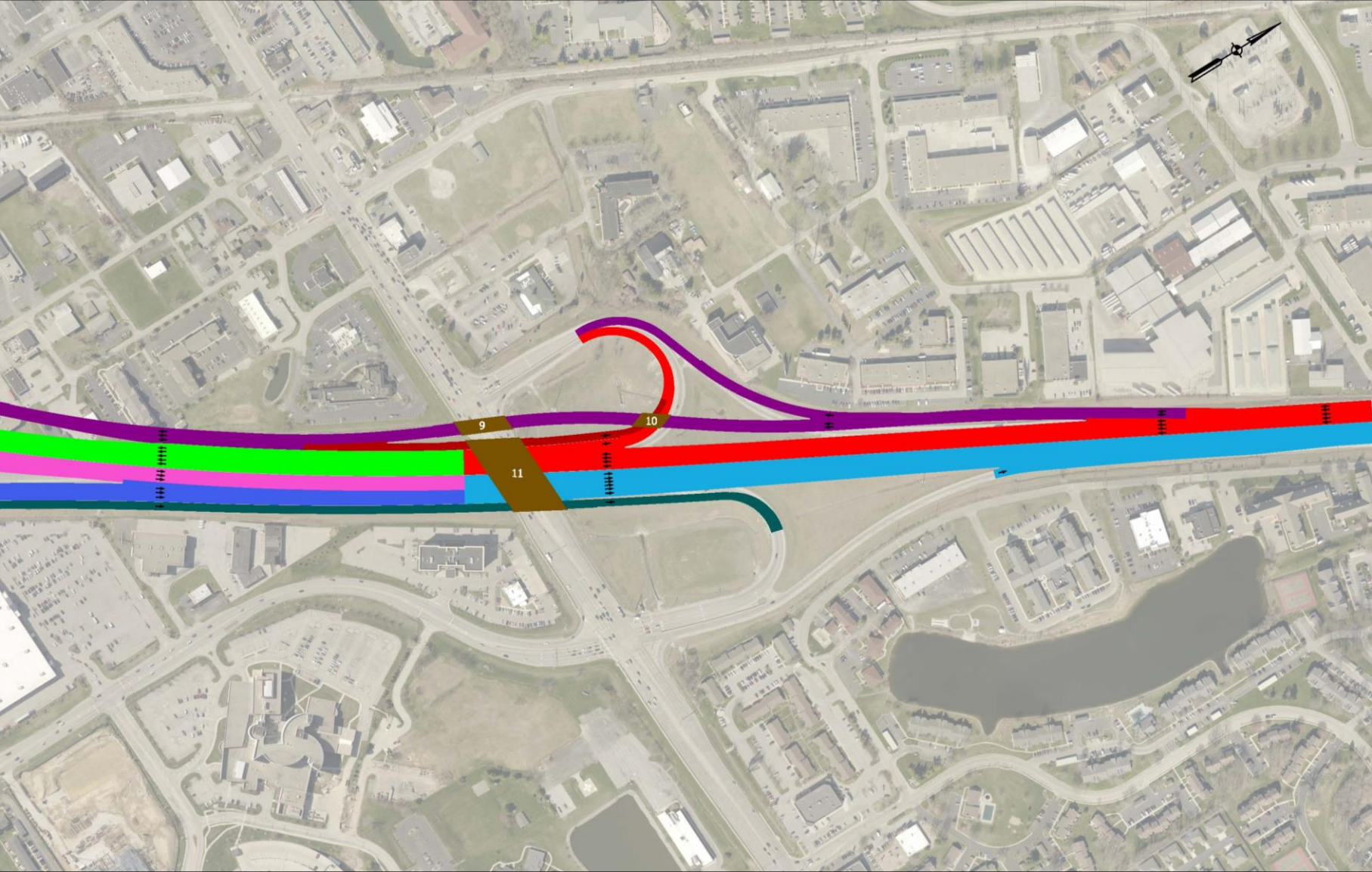
Build Alternative "B" Overview (I-69/82nd St Interchange)



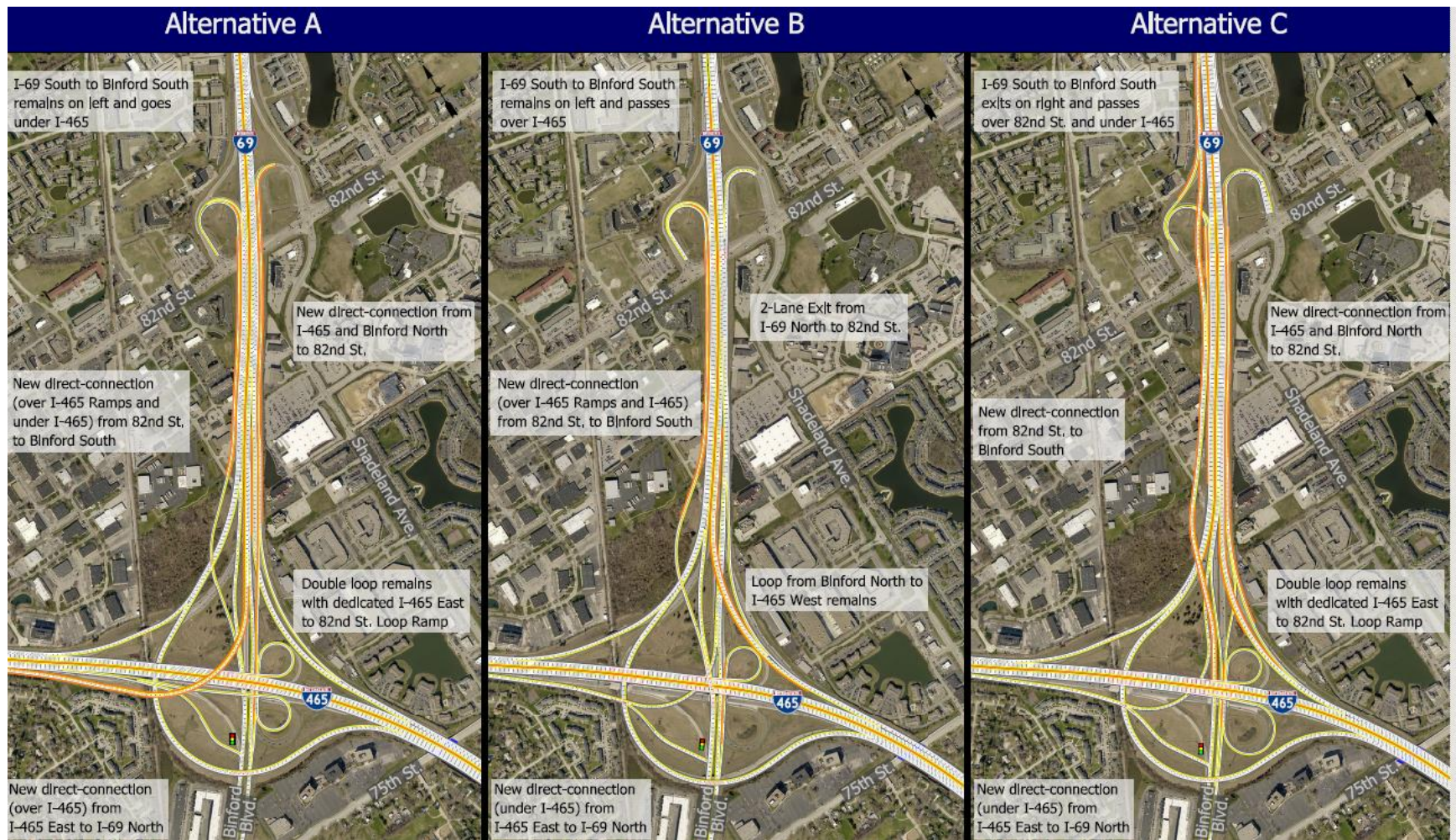
Build Alternative "C" Overview (I-465/I-69 Interchange)



Build Alternative "C" Overview (I-69/82nd St Interchange)



Alternative Analysis Overview - A, B and C



Three Build-Alternatives were presented at an August 2017 open house.

Alternative Analysis – Traffic Operations

Qualitative Ratings (Three Adjectives – Low, Medium, High):

- Low – Does not meet LOS requirements for most movements.
- Medium – Achieves minimum LOS for all movements. Limited separation between freeway system and local service movements.
- High – Achieves desirable LOS for majority of movements. Full separation between freeway system and local service movements.

CRITERIA	BUILD ALTERNATIVES			NO BUILD
	A	B	C	
AM Vehicular Delay (s)	33	33	34	185
PM Vehicular Delay (s)	37	37	37	289
AM Network Speed (mph)	57	58	57	47
PM Network Speed (mph)	57	57	57	40
Overall Traffic Operations (Vissim)	High	High	High	Low
NB I-69 (Binford to 82 nd Street)	High (Barrier Separated)	Medium (EB I-465 to NB I-69 freeway traffic weaves with 82 nd Street local traffic)	High (Barrier Separated)	Low
C-D System Operations	Medium (Limited CD System)	Medium (Limited C-D System)	High (Full C-D System)	N/A
SB I-69 Split to I-465/Binford	Medium (SB Binford on left)	Medium (SB Binford on left)	High (SB I-465 on left)	Medium

Alternative Analysis – Safety

Qualitative Ratings (Three Adjectives – Low, Medium, High):

- Low – Large overall crash rate in relation to other ramps.
- Medium – Above-average overall crash rate in relation to other ramps.
- High – Small overall crash rate in relation to other ramps.

CRITERIA	BUILD ALTERNATIVES			NO BUILD
	A	B	C	
Predicated Yearly Crashes	231	216	232	305
Fatal/Injury Percentage	31.20%	29.60%	31.00%	32.50%
82 nd Street to SB I-69 (Alt A/C) 82 nd Street to WB I-465 (Alt B)	Medium	High (Barrier Separated)	Medium	Medium
NB Binford to WB I-465	Medium	High (No Weave with EB I-465 to NB Binford Loop)	Medium	Medium
SB I-69 to SB I-465	Medium (Long Barrier Separated Ramp)	High	High (SB I-465 ramp on left)	Low
SB I-69 to SB Binford	High	Low (5% downgrade to signal creates risk of rear-end crashes)	Medium	High
NB I-69 to 82 nd	High (Barrier Separated)	Medium	High (Barrier Separated)	Medium

Alternative Analysis – Driver Expectancy

Qualitative Ratings (Three Adjectives – Low, Medium, High):

- Low – Non-desirable geometric features. Signing does not meet MUTCD requirements
- Medium – Adequate geometry and signing . MUTCD minimum values met.
- High – Desirable geometry meets / exceeds standards with simple signing that meets MUTCD desirable values.

CRITERIA	BUILD ALTERNATIVES			NO BUILD
	A	B	C	
Overall Geometric Layout	Medium (SB Binford on left; NB I-69 lane drop)	Medium	High (SB Binford on right; Full C-D system)	Low
EB I-465 to NB I-69 Ramp Profile	High (Upgrade)	Medium (Downgrade)	Medium (Downgrade)	Medium
NB I-465 to NB I-69 Ramp	Medium	High (Enters on left side of I-69)	Medium	Low
NB I-69 Lane Drop Spacing	Medium (Flyover pushes gore farther north)	Medium	High (Maximize lane drop distance)	N/A
NB I-69 Separation for 82 nd Street	High (Barrier)	Medium	High (Barrier)	Medium
EB I-465 Exit Ramps	Medium	High (Single Exit)	Medium	Low
SB I-69 to SB Binford Blvd	Medium (Exit on Left)	Medium (Exit on Left)	High (Exit on Right)	Medium
EB I-465 to NB Binford / 82 nd Street Loop Ramp	Medium	High (Existing loop ramp is removed)	Medium	Low
SB I-69 to SB I-465	High	Low (RT side ramp drops on curve)	High	Low
SB Binford Blvd Profile at Signal	High	Low (Steep profile from 3 rd level bridge to existing ground)	High	N/A
Signing	High (Separates SB I-69 to Binford ramp from 82 nd Street entrance)	High (One EB I-465 exit)	Medium (SB 82 nd Street on-ramp splits)	Medium

Alternative Analysis – Constructability / Long-Term Maintenance

Qualitative Ratings (Three Adjectives – Low, Medium, High):

- Low – Complex bridges (large skew, straddle bents, long spans, etc.) and construction (extra MOT phases, traffic conflicts). Difficult on-going maintenance.
- Medium – Unconventional construction, conflicts with existing traffic and phases. No overly complex elements requiring special access/preventative maintenance.
- High – Conventional construction techniques with few traffic conflicts. Potential for accelerated construction. Straight-forward on-going maintenance.

CRITERIA	BUILD ALTERNATIVES			NO BUILD
	A	B	C	
Overall Constructability / Maintenance	Medium (large 3 rd -level bridge)	Medium (large 3 rd -level bridge)	High (no 3 rd -level bridges)	N/A
Number of Bridges:	10	9	11	8
Complex Bridges	3 Bridges (#6, #7, #9)	3 Bridges (#6, #7, #8) Bridge #8 is most complex	3 Bridges (#6, #7, #8)	
Total Bridge Area (sf)	274,550	259,170	257,550	96,000
No. of 3 rd Level Structures	1	1	0	0
No. of Straddle Bent Bridges	1	1	2	0
Retaining Wall Area (sf)	149,000	62,320	128,600	N/A

Summary of Alternative Analysis

CRITERIA	BUILD ALTERNATIVES			NO BUILD
	A	B	C	
MEETS PURPOSE AND NEED				
	Yes	Yes	Yes	No
OVERALL QUALITATIVE SUMMARY				
High	20	15	23	
Medium	17	18	15	
Low	3	6	3	

Preliminary Recommended Alternative C Modified (I-69 / 82nd Street Interchange)



Preliminary Recommended Alternative C Modified (I-465 / I-69 Interchange)



Preliminary Recommended Alternative C Modified (I-465 ATL)



Proposed Traffic Operations AM Peak "Hot Spot" #1 (WB I-465)



Proposed Traffic Operations

AM Peak “Hot Spot” #1 (WB I-465)

No-Build - AM

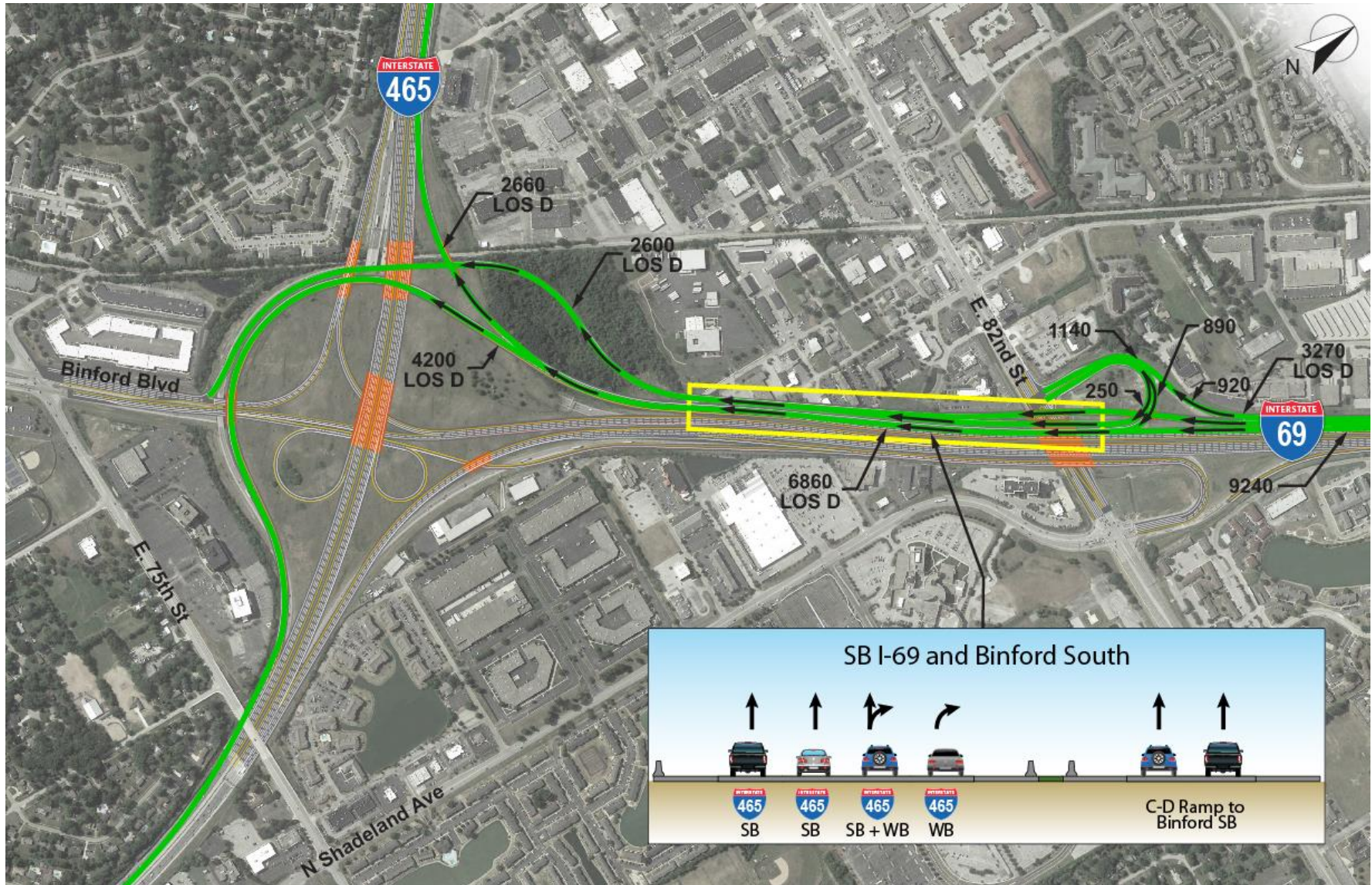
Route	Segment	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	Peak-Hour Average	Speed (mph)
NB/WB I-465	56th St On to NB to NB Ramp	60	38	22	16	16	16	22	26	17	>60
		64	40	34	34	34	34	32	31	34	60
		65	55	53	54	54	54	53	52	54	58
		65	56	55	55	55	55	55	52	55	55
		65	56	54	55	54	53	54	50	54	53
	NB to NB thru NB to WB	67	59	58	53	40	40	45	39	48	50
	NB to WB Ramp to SB to WB Ramp	63	57	49	34	31	31	32	26	36	
		66	54	36	26	28	28	29	23	30	
	I-69 to Allisonville Rd	62	46	29	20	22	23	23	20	23	
		64	51	45	45	46	46	45	45	45	
	at Allisonville Rd	64	55	52	52	52	52	52	53	52	
		64	57	54	54	54	54	54	55	54	
		64	57	55	55	55	55	55	55	55	
	Allisonville On to Keystone Off	64	60	58	58	58	58	58	58	58	
		65	61	60	60	60	60	60	60	60	

Recommended Alternative - AM

Route	Segment	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	Peak-Hour Average	Speed (mph)
NB/WB I-465	56th/Shadeland On to NB to NB Ramp	60	59	58	58	59	60	60	61	59	>60
		60	59	59	59	59	60	61	61	59	60
		60	59	58	58	59	60	60	61	59	57.5
		61	60	59	59	59	60	61	61	59	55
		61	60	59	59	59	60	60	61	59	52.5
	NB to NB Ramp to NB to WB Ramp	61	60	60	60	60	60	61	62	60	50
	NB to WB Ramp to SB to WB Ramp	60	60	58	58	59	60	61	61	59	
		59	58	56	56	57	58	60	60	57	
	I-69 to Allisonville Rd	60	59	57	57	57	58	60	61	57	
		61	60	59	59	60	60	61	61	60	
	at Allisonville Rd	61	60	59	59	59	60	61	61	59	
		61	60	59	59	59	60	61	61	59	
		62	60	59	59	60	61	61	62	60	
	Allisonville Rd On to Keystone Ave Off	62	60	60	59	60	61	61	62	60	
		61	59	56	56	57	59	60	61	57	
		61	59	57	57	57	59	60	60	58	

Proposed Traffic Operations

AM Peak "Hot Spot" #2 (SB I-69)



Proposed Traffic Operations

AM Peak “Hot Spot” #2 (SB I-69)

No-Build - AM

Route	Segment	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	Peak-Hour Average	Speed (mph)
SB I-69	106th	64	64	63	63	60	43	36	36	57	>60
		63	62	61	58	24	13	12	13	39	60
	106th On to 96th Off	62	61	59	51	19	14	15	16	36	58
		63	62	61	43	19	15	16	17	34	55
	96th	61	61	60	35	20	16	17	19	33	53
		63	62	61	28	18	15	16	18	30	50
	96th On to 82nd Off	63	62	61	24	18	16	16	18	29	
		63	62	58	22	17	16	16	18	28	
	82nd St	64	63	50	19	16	15	14	16	25	
		59	56	35	22	19	17	17	19	23	
	82nd On to I-465 Split	59	52	28	24	20	18	19	20	22	
		58	45	24	22	18	17	18	19	20	
	82nd On to I-465 Split	48	30	25	23	19	18	18	19	21	
		50	43	42	39	28	26	25	28	34	
51		50	50	45	30	28	28	31	38		
		54	52	51	42	24	24	26	35		

Recommended Alternative - AM

Route	Segment	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	Peak-Hour Average	Speed (mph)
SB I-69	at 106th St	65	64	64	64	65	65	65	65	65	>60
		65	64	63	64	64	65	65	65	64	60
	106th St On to 96th St Off	63	62	61	61	62	63	64	64	62	57.5
		63	62	61	61	62	63	64	64	62	55
	at 96th St	62	60	58	58	60	62	62	63	60	52.5
		62	61	60	60	61	62	63	63	61	50
	96th St On to 82nd St Off	63	62	60	62	62	63	63	63	62	
		62	61	56	58	60	62	63	63	59	
	at 82nd St	62	61	58	59	60	62	63	63	60	
		60	59	57	58	58	60	61	61	58	
	82nd St On to I-465 Split	60	58	57	58	58	59	60	60	58	
		61	60	59	59	59	60	61	61	59	
		60	59	58	58	59	60	61	61	59	
			59	57	55	56	57	58	60	57	
		60	58	57	57	58	59	60	58		
		59	59	58	58	58	59	60	58		

Proposed Traffic Operations PM Peak “Hot Spot” #3 (EB I-465)



Proposed Traffic Operations

PM Peak “Hot Spot” #3 (EB I-465)

No-Build - PM

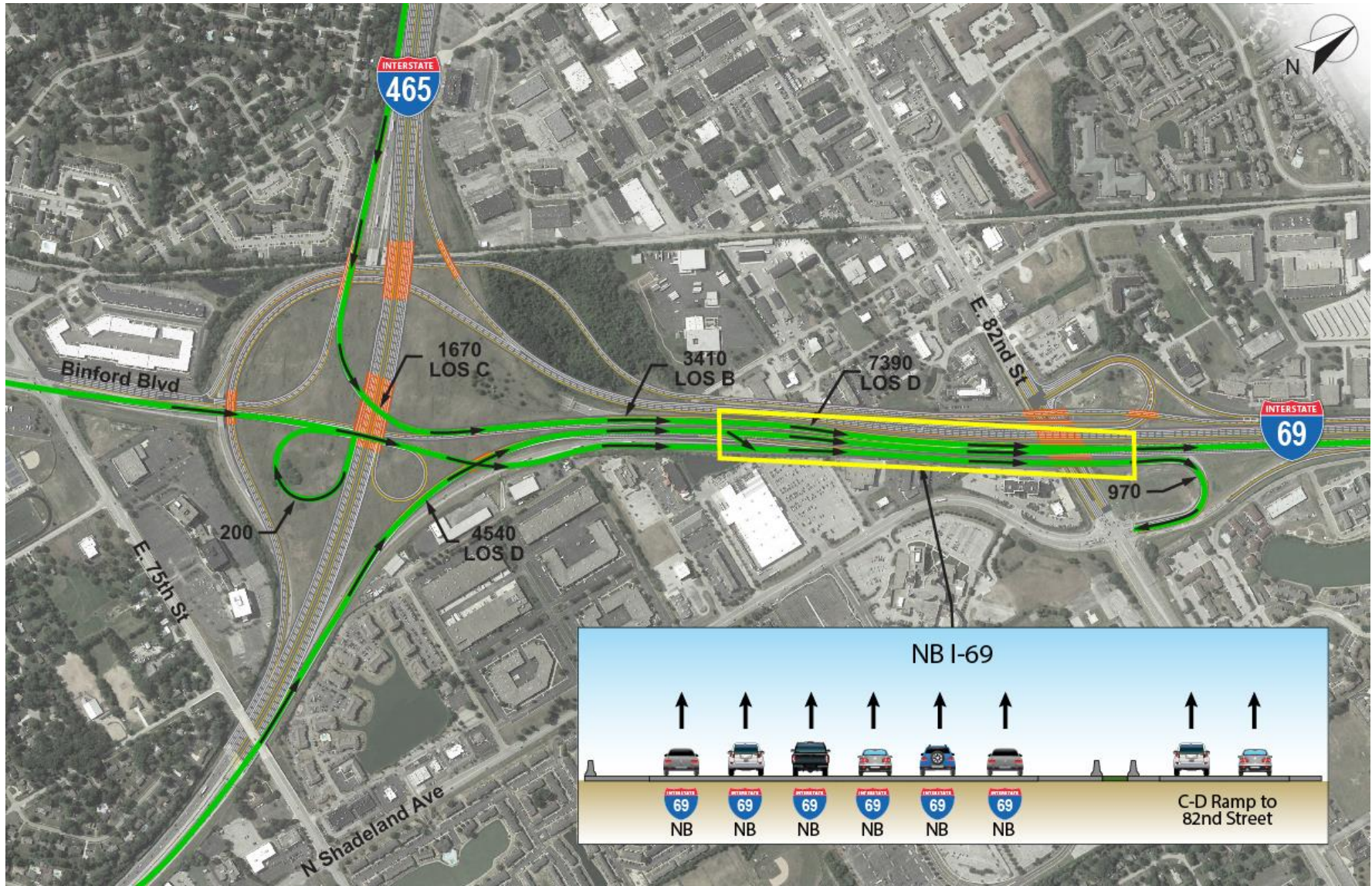
Route	Segment	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15	Peak-Hour Average	Speed (mph)
EB/SB I-465	Keystone On to Allisonville Off	60	55	45	36	30	24	20	18	34	>60
		65	39	26	25	24	24	25	25	25	60
	at Allisonville Rd	67	44	29	28	27	26	29	29	27	58
		68	43	29	29	28	28	30	30	28	55
		68	41	29	28	28	28	29	30	28	53
		69	38	28	27	27	26	29	30	27	50
	Allisonville to I-69	62	38	30	28	28	28	31	32	29	
		64	31	22	23	22	22	24	26	22	
		65	44	42	40	41	39	40	39	40	
	EB to SB Ramp to EB to NB Ramp	65	50	47	48	47	46	46	46	47	
		62	49	47	46	47	47	47	48	47	
	EB to NB Ramp to SB to SB Ramp	54	42	39	40	40	42	41	43	40	
		65	55	54	54	54	54	54	54	54	
	I-69 to 56th St Off	60	57	56	56	56	56	56	56	56	
		63	58	56	56	56	56	56	57	56	
		64	60	58	58	58	58	58	59	58	

Recommended Alternative - PM

Route	Segment	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15	Peak-Hour Average	Speed (mph)
EB/SB I-465	Keystone Ave On to Allisonville Rd Off	59	59	59	59	58	59	59	60	59	>60
		57	57	57	57	55	56	57	58	56	60
	at Allisonville Rd	59	58	58	58	57	57	58	59	58	57.5
		58	57	58	57	57	57	58	59	58	55
		56	56	57	56	56	55	57	58	56	52.5
		56	56	56	55	55	55	56	57	55	50
	Allisonville Rd On to I-69	59	58	58	58	58	58	59	59	58	
		59	58	58	58	58	58	58	59	58	
		59	57	58	57	57	57	58	58	57	
	EB to NB Ramp to EB to 82nd St Ramp	61	60	60	60	59	60	60	60	60	
		60	59	59	59	59	59	59	60	59	
		60	59	59	59	59	59	59	60	59	
	EB to 82nd St Ramp to SB to SB Ramp	60	59	59	59	59	59	59	60	59	
		61	60	60	60	59	59	60	61	60	
	I-69 to 56th/Shadeland	61	60	60	60	60	60	60	61	60	
		58	56	55	55	54	55	56	58	55	
58		56	56	56	55	55	56	58	55		
	60	58	58	57	58	57	58	59	58		

Proposed Traffic Operations

PM Peak “Hot Spot” #4 (NB I-69)



Proposed Traffic Operations

PM Peak “Hot Spot” #4 (NB I-69)

No-Build - PM

Route	Segment	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15	Peak-Hour Average	Speed (mph)
NB I-69	NB Binford Blvd	57	55	54	54	54	54	55	56	54	>60
		59	53	51	51	51	51	52	52	51	60
	I-465 to 82nd St Off	64	58	57	57	57	57	57	57	57	58
		62	54	55	53	54	54	55	56	54	55
	at 82nd St	65	60	59	59	59	59	59	60	59	53
		64	61	60	60	60	60	60	60	60	50
	82nd St On to 96th St Off	64	59	58	57	57	58	58	58	57	
		65	62	62	61	61	61	62	62	61	
		65	62	62	61	61	61	62	61	61	
	at 96th St	66	63	63	62	62	63	63	63	62	
		66	64	63	63	63	63	63	63	63	
		66	64	63	63	63	63	63	63	63	
	96th St On to 106th St Off	66	64	63	63	63	63	63	63	63	
		65	62	61	61	61	61	61	61	61	
		66	64	63	63	63	63	63	63	63	
	at 106th St	66	64	63	63	63	63	63	63	63	
67		65	65	65	65	65	65	65	65		

Recommended Alternative - PM

Route	Segment	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15	Peak-Hour Average	Speed (mph)
NB I-69	EB to NB Ramp On to NB to NB Ramp On	61	61	60	61	60	61	61	61	61	>60
		62	61	61	61	61	61	61	61	61	60
	at 82nd St	59	58	57	57	57	56	57	59	57	57.5
		62	61	61	61	60	60	61	61	61	55
	82nd St On to 96th St Off	62	61	61	61	61	61	61	61	61	52.5
		60	59	59	59	58	58	59	60	58	50
		57	55	55	54	53	54	55	57	54	
	at 96th St	61	60	60	59	58	59	60	61	59	
		62	60	61	60	61	60	61	61	60	
		63	61	62	61	61	61	62	62	61	
	96th St On to 106th St Off	63	62	62	62	62	62	62	63	62	
		63	62	62	62	62	62	62	63	62	
		64	63	63	63	63	63	63	63	63	
	at 106th St	64	63	63	63	63	63	63	63	63	
		63	60	61	61	61	61	61	62	61	
		64	63	63	63	63	63	63	63	63	
	65	64	64	64	64	64	64	65	64		

Questions

