

**BIG DATA, BIG IMPACT:** 

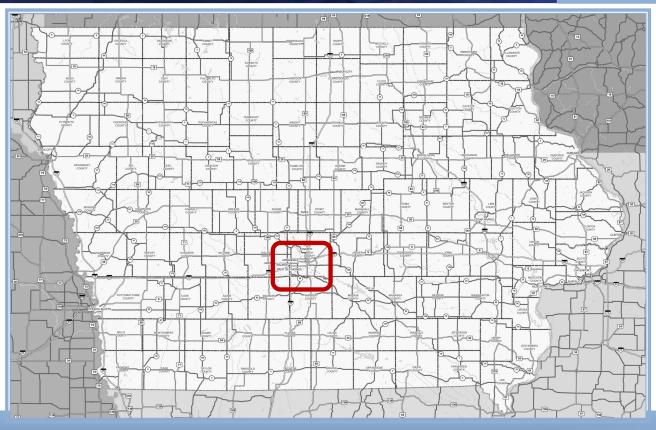
**Des Moines' Traffic Operations** 

Molly Long, PE, PTOE Principal Traffic Engineer



### WHERE ARE WE?

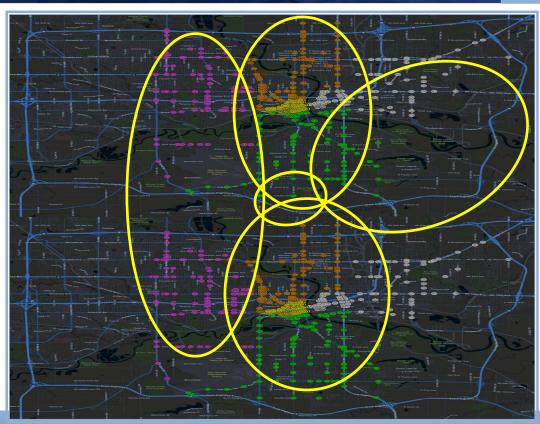






### WHAT DO WE HAVE?







## PROJECT PROGRESSION

Phase 1: 84 Signals, Spring 2019

Phase 2: 86 Signals, Spring 2021

Phase 3: 85 Signals, Spring 2022

Phase 4: 83 Signals, Fall 2022

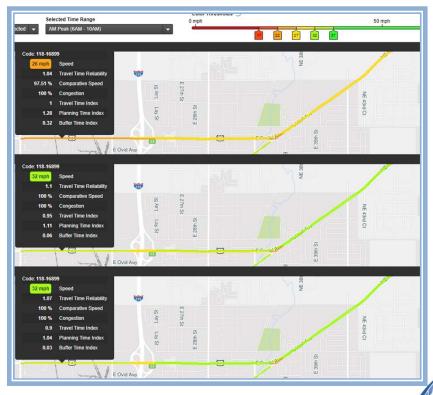
Phase 5: 89 Signals, Fall 2023





#### **HOW IT STARTED VS HOW IT'S GOING**





CITY OF DES MOINES

## DOWNTOWN RESULTS In-Depth Dive



Performance Summaries for XD\_P4\_MLK/19th\_Ingersoll-Washington(Merge)\_NB-Only and XD\_P4\_MLK/19th\_Ingersoll-Washin 2019 vs 2021

			Speed (mph	1)				Trav	el time (min	utes)		1		Trave	l time (sec	onds)	Speed (mph) Percent Change					
	12:00 AM -	6:00 AM -	9:00 AM -	3:00 PM -	6:00 PM -		12:00 AM	6:00 AM -	9:00 AM -	3:00 PM -	6:00 PM -	1	12:00 AM	6:00 AM -	9:00 AM -	3:00 PM -	6:00 PM -	12:00 AM	6:00 AM -	9:00 AM -	3:00 PM -	6:00 PM -
	6:00 AM	9:00 AM	3:00 PM	6:00 PM	12:00 AM		6:00 AM	9:00 AM	3:00 PM	6:00 PM	12:00 AM	-	6:00 AM	9:00 AM	3:00 PM	6:00 PM	12:00 AM	- 6:00 AM	9:00 AM	3:00 PM	6:00 PM	12:00 AM
Mon	-1.1	3.4	2.7	3.7	2.5	0 0	0.17	-0.54	-0.46	-0.66	-0.34	0	10.0	-32.2	-27.4	-39.4	-20.4	-4%	15%	12%	17%	10%
Tue	2.2	2.7	2.7	3.4	2.1	0 0	-0.29	-0.42	-0.46	-0.61	-0.29	0	-17.4	-25.2	-27.6	-36.8	-17.6	8%	11%	12%	16%	8%
Wed	-0.1	2.6	2.6	4.8	2.3	0 0	0.01	-0.40	-0.44	-0.90	-0.33	0	0.8	-24.0	-26.6	-53.8	-20.0	0%	11%	11%	23%	9%
Thu	1.9	3.2	3.1	4.2	1.6	0 0	-0.22	-0.51	-0.54	-0.85	-0.24	0	-13.0	-30.8	-32.2	-50.8	-14.2	7%	14%	14%	21%	6%
Fri	0.5	2.0	2.5	3.5	0.6	0 0	-0.06	-0.30	-0.41	-0.62	-0.06	0	-3.4	-18.0	-24.8	-37.2	-3.8	2%	8%	11%	16%	2%
Weekdays	0.7	2.7	2.7	4.0	1.8	0 0	-0.08	-0.43	-0.46	-0.72	-0.26	0	-4.6	-26.0	-27.8	-43.4	-15.6	2%	11%	12%	19%	7%
Sat	-0.5	2.2	3.4	2.9	2.6	0 0	0.07	-0.25	-0.50	-0.45	-0.36	0	4.0	-15.2	-30.0	-27.2	-21.4	-2%	8%	14%	12%	10%
Sun	0.4	2.1	3.9	3.2	2.7	0 0	-0.04	-0.25	-0.56	-0.49	-0.34	0	-2.6	-14.8	-33.8	-29.4	-20.6	1%	7%	16%	13%	10%
Weekends	-0.1	2.1	3.6	3.0	2.6	0 0	0.01	-0.25	-0.53	-0.47	-0.36	0	0.6	-15.0	-31.6	-28.4	-21.4	0%	8%	15%	13%	10%
All Days	0.5	2.7	2.9	3.7	2.0	0 0	-0.05	-0.38	-0.48	-0.65	-0.28	0	-3.0	-22.8	-28.8	-39.2	-17.0	2%	11%	13%	17%	8%



## **DOWNTOWN RESULTS**



-					
		Travel Time	(minutes)		
	12:00 AM -	6:00 AM -	9:00 AM -	3:00 PM -	6:00 PM -
Time Period	6:00 AM	9:00 AM	3:00 PM	6:00 PM	12:00 AM
	N	lorthbound/	Eastbound		
Before	10.80	11.86	12.00	12.90	11.42
After	10.04	9.89	10.16	10.49	10.14
Difference	-0.76	-1.97	-1.84	-2.41	-1.28
Percent Change	-7%	-17%	-15%	-19%	-11%
	S	outhbound/	Westbound		
Before	13.97	14.24	14.27	15.49	13.88
After	12.66	12.43	12.79	13.31	12.59
Difference	-1.31	-1.81	-1.48	-2.18	-1.29
Percent Change	-9%	-13%	-10%	-14%	-9%
	Т	otal Combin	ned System		
Before	24.77	26.10	26.27	28.39	25.30
After	22.70	22.32	22.95	23.80	22.73
Difference	-2.07	-3.78	-3.32	-4.59	-2.57
Percent Change	-8%	-14%	-13%	-16%	-10%

6	Speed (mph)													
	12:00 AM -	6:00 AM -	9:00 AM -	3:00 PM -	6:00 PM -									
Time Period	6:00 AM	9:00 AM	3:00 PM	6:00 PM	12:00 AM									
	N	lorthbound/	Eastbound											
Before	19.70	18.03	17.75	16.70	18.43									
After	20.55	20.58	20.00	19.38	20.05									
Difference	0.85	2.55	2.25	2.68	1.63									
Percent Change	4%	14%	13%	16%	9%									
Southbound/Westbound														
Before	18.20	17.80	17.78	16.22	18.18									
After	20.22	20.32	19.76	18.90	20.12									
Difference	2.02	2.52	1.98	2.68	1.94									
Percent Change	11%	14%	11%	17%	11%									
	Т	otal Combin	ned System											
Before	18.95	17.91	17.77	16.46	18.30									
After	20.39	20.45	19.88	19.14	20.09									
Difference	1.44	2.54	2.12	2.68	1.78									
Percent Change	8%	14%	12%	16%	10%									



## DOWNTOWN CONGESTION



100	300	100	90.05	99.96 88.88	95.9 87.71	97.78	99.47	96.08 96.2	95.76 96.38	93.65 98.62	86. 94.		85.54	95.24		3.79	100	99.38		100					
82.58	84.55	84.83	90.05	88.88 92.25	73.44	92.23 78.01	95.3 84.81	96.2 81.92	96.38 77.26	98.62 80.49	94. 81.		85.54	84.93 84.31		.07	82.16	87.68	. 8	9.54					
99.6	100	100	1,00	100	86.66	91.25	99.08	94.37	91.54	93.8	90.	79	90.31	93.57	89	.27	93.34	97.24	, 9	7.87					
82.32	86.16 100	89.52 100	90.56	100	77.83 97.83	82.63	84.66	77.05	74.13	69.44	72.	.95	80.74	82.59	81	.75	83.65	92.62	9	0.73					
74.76	74.18	75.85	80.87	80.11	65.4	66.4	70.14	68.86	2:45 PM × 3	00 PM   3:1	15 PM - 3:3	30 PM   + 3	:45 PM - 4:0	0 PM   + 4:1	5 PM - 4:3	30 PM - 4	45 PM × 5:0	0 PM   - 5:1	5 PM - 5:	30 PM - 5:	45 PM × 6:	00 PM × 6::	15 PM - 6	:30 PM - 6	:45 PM 💌
1.00	100	100	100	100	100	100	100	100	100 98.16	100 88.75	93,55 94,14	100	100 99.42	100 95.81	100	100	97.34	97.61 91.34	100 86.33	100 88.31	100	98.66 96.92	94.84	100	100 98.82
1.00	100	100	1.00	100	100	100	100	100	90.97	92.14	91.08	91.36	97.27	100	97.81	98.26	97.25	96.83	94.12	93.21	91.15	94.34	95.52	95.35	98.42
76.53 89.35	76.52 84.16	80.32 82.11	79.27 92.09	74.47 89.4	65.46 92.48	69.07 <b>92.5</b>	68.11 92.9	64.33 96.09	97.34 96.2	97.18 91.24	94.63 87.21	98.65 87.31	100 92.97	100 94.48	100 98.45	100	100	100	100 97.65	100 96.08	98.94 91.23	97.98 98.13	97.53 100	100	100
100	100	100	100	100	95.71	99.4	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
89.81	84.59	89.3	88.3	89.79	91.37	86.57	88.47	86.24	88.72 100	89.61 100	84.52	84.89	90.61	91.76	87.8	87.62	100	81.4	80.83	83.48	85.91	92.76	94.01	93.19	96.88
95.29 75.35	96.71 72,47	99.27 80.1	95.54 73.35	93.33 75.54	91.69 79.36	96.25 74.89	95.35 75.25	94.66 73.58	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
88.81	88.38	96.63	90.79	93.88	96.11	99.55	100	100	91.5 93.41	90.23 82.74	82.88	82.24	87.75 97.83	88.21 97.19	98.6	90.72	95.37	92.82	90.83	88.28	88.86	97.5		98.6	99.64
68.05	70.29	77.15	67.41	69.09	73.79	70.04	68.38	67.44	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
76.94	100 79.71	100 79.71	100 69.92	100 71.52	74.63	100 71.87	100 67.9	100 67.83	100	100 98.87	100 96.26	98.73	100	100 100	100		100 100	100	100	100 99.24	100	100	100		
70.96	79.71	80.13	69.92	69.56	74.63	70.97	67.47	68.22	100	100 88.87	100	100	100	100	100	99.96	100	98.98	92.98	100	100	99.85	100	100	97.71
100	99.44	98.48	100	100	100	100	100	100	99.92	100	90.66	96.52	100	100	97.19	99.04	98.44	97.53	91.08	97.58	98.73	99.65	100	100	99.73
72.15	66.38	73.35	73.16	76.3	80.98	77.23	83.08	85.35	100	100	100	100	100	100 93.43	100	100	100 88.69	100	100	100	100	100	100	100	100
73.67 63.68	75.25 70.72	72.22 71.16	66.68 66.07	72.97 69.79	72.86 74.23	67.82 68.6	73.09	65.59 67.96	96.25	100	92.22	100	100	93.43	92.89	96.3	95.87	94.96	84.63 89.42	84.73 92.44	94.72	100	100	100	100
64.93	68.06	68.46	63.09	70.12	70.87	63.85	67.21	64.58	100 81.39	100 74	100 72.58	100 76.76	100 83.58	100 88.89	100 91.57	100	100	100	100	100 82.91	100 85.07	100 88.33	100 85.65	100 92.53	100
74.18	83.21	82.58	74.26	75.7	69.31	68.79	77.52	74.52	90.47	93.08	85.29	92.86	94.1	88.37	91.82	90.24	84.23	79.46	80.53	80.19	86.6	97.76	100	98.96	94.34
97.18 60.04	95.73 70.3	97.88 71.16	88.52 65.18	81.12 69.32	71.96 61.58	71.83 63.64	68.99 69.21	73.83 65.45	80.97 82.53	79.36 83.54	74.18 77.48	77.5 83.95	82.15 85.01	79.14 84	79.21 88.32	72.94 82.25	71.56 75.57	73.39 73.8	76.72 74.09	75.77 73.46	78.53 82.41	81.92 89.31	81.25 87.69	82.15	77.03 81.53
65.75	73.52	73.24	66.73	63.35	56.47	58.65	59.29	58.08	88.44	88.35	100	100	86.63	86.64	85.27	86.56	83.31	83.66	91.09	91	87.82	87.09	96.5	100	96.71
70.90	741.09	oJ.99	o <sub>5</sub> 1.94	83.38	89.75	73.37	υ <b>7</b> 547	88.25	76.68 79.53	67.26 81.76	69.45 94.9	74 91.18	68.97 79.81	61.56 78.06	62.03 74.53	74.66 78.11	80.54 76.42	81.62 77.54	82.95 86.17	92.73 86.69	92.73 83.15	98.17 81.06	90.62 87.36	90.64 93.2	92.71 88.97
100	99.44	98.48	100	100	100	100	100	100	89.66	89.41	90,55	87.12	80.51	76	72.79	78.99	76.79	80.47	89.96	89.32	89.31	90.8	95.82	97.38	95.48
72.15	66.38	73,35	73.16	76.3	80.98	77.23	83.08	85,35	*9,93	85 <sub>4</sub> 38	93.22	89,38	<sup>88</sup> ,03	39.51	82.68	*30.9	99.87	94.98	93.42	92.44	94.72	100	100		
73.67	75.25	72.22	66.68	72.97	72.86	67.82	66.14	65.59	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Contract of the								67.96	81.39 90.47	74	72.58	76.76	83.58	88.89 88.37	91.57	93.91	89.5	88.59	86.76	82.91	85.07	88.33	85.65	92.53	95.83
63.68	70.72	71.16	66.07	69.79	74.23	68.6	73.09	100000000000000000000000000000000000000	1000.11	93.08 79.36	85.29	92.86	2.15	00001	91.82	90.24	84.23	79.46	80.53	80.19	86.6	97.76	100	98.96	77.03
64.93	68.06	68.46	63.09	70.12	70.87	63.85	67.21	64.58	80.97		74.18 77.48	77.5	82.15 85.01	79.14 84	79.21 88.32	72.94 82.25	71.56 75.57	73.39	76.72 74.09	75.77 73.46	78.53 82.41	81.92 89.31	81.25 87.69	82.15 86.5	81.53
74.18	83.21	82.58	74.26	75.7	69.31	68.79	77.52	74.52	82.53	83.54 88.35	100	83.95 100	85.01	86.64	85.27	86.56	83.31	73.8 83.66	91.09	73.40	87.82	87.09	96.5	100	96.71
97.18	95.73	97.88	88.52	81.12	71.96	71.83	68.99	73.83	76.68	67.26	69.45	74	68,97	61.56	62.03	74.66	80.54	81.62	82.95	92.73	92.73	98.17	90.62	90.64	90.71
60.04	70.3	71.16	65.18	69.32	61.58	63.64	69.21	65.45	79.53	81.76	94.9	91.18	79.81	78.06	74.53	78.11	76.42	77.54	86.17	86.69	83.15	81.06	87.36	93.2	88.97
65.75	73.52	73.24	66.73	63.35	56,47	58.65	59.29	58.08	89.66	89.41	90.55	87.12	80.51	76.00	72.79	78.99	76.79	80.47	89.96	89.32	89.31	90.8	95.82	97.38	95.48
100	100	100	100	97.37	89.26	87.22	86.3	91.06	89.91	85.38	87.54	89.14	88.03	79.61	80.68	87.06	90.62	92.04			92.73	100	100		100
97.18	95.73	97.88	88.52	81.12	71.96	71.83	68.99	73.83	78.01	74.06	78.49	81.37	76.23	67.56	67.12	77.69	85.57	86.8	87.54	92.73		98.96	90.86	92.31	94.52
									97.43	97.48	91.49	91.26	85.86	84.35	84.82	90.1	88.74	92.28	99.76	99.14	100	100	98.02	97.98	100
91.75	95.57	96.15	88.28	80.63	72.96	75.13	74.23	74.81	100	100	100	100	100	100	100	100	96.48	94.98	100	100	99.57	100	100	100	100
99.61	100	100	92.03	88.45	82.24	83.18	92.38	90.35	99.49	96.34	92.83	95.31	87.12	83.34	87.56	99.04	94.08	96.94	100	100	100	100	100	100	100
97.59	100	100	91.84	85.63	74.03	79.44	75.93	79.27	97.19	96.06	88.73	85.35	83.21	79.02	77.13	78.8	77.78	83.15	93.49	91.62	91.36	94.27	94.12	93.61	99.02
78.27	83.56	81.45	74.32	63.53	59.46	59.57	60.09	59.36	79.68	68.47	71.34	76.19	72.44	65.09	66.08	76.05	83.19	84.44	85.45	92.73	92.73	99.29	93.89	94.07	95.29
97.18	95.73	97.88	88.52	81.12	71.96	71.83	68.99	73.83	82.52	79.36	75.81	74.41	77.35	74.83	71.71	78.81	78.18	81.26	81.68	82.62	93.57	95.54	94.43	81.33	86.53
76.7	88.06	80.61	77.05	74.94	75.3	70.9	71.69	68.93	89.19	81.62	77.84	78.48	81.81	82.93	83.1	88.43	87.34	90.61	91.23	90.95	97.82	99.87	94.06	88.78	89.94
	90.06	88.34	81.45	82.73	84.95	81.33	82.02	76.62	76.47	78.95	78.61	75.29	72.46	67.4	73.55	74.5	74.34	74.26	72.32	76.25	90.9	92.72	93.66	84.97	83.7
81.71					-		111112000000		93.61	85.19	83.22	85.27	89.21	90.64	93.6	96.24	97.54	98.69	100	100	100	100	95.22	89.58	93.77
73.99	87.97	77.6 91.74	73.84	65.01 91.81	66.73 94.6	63.06 93.95	63.43 91.17	62.92	- 13	N. 7/4	TV4	***	7.5.5.	801-000		· na	*****	*****							





# REAL RESULTS FOR LEADERSHIP AND PUBLIC BUY IN

#### Phase &

"From 12/4-Khabrul? kweektalayethectiveriall travel time safviorg & war is to the pearth patrice of patrice to the safviorg & war is to the pearth patrice of the safviorg & war is to the pearth patrice of the safviorg of t



#### HOW IT STARTED VS HOW IT'S GOING

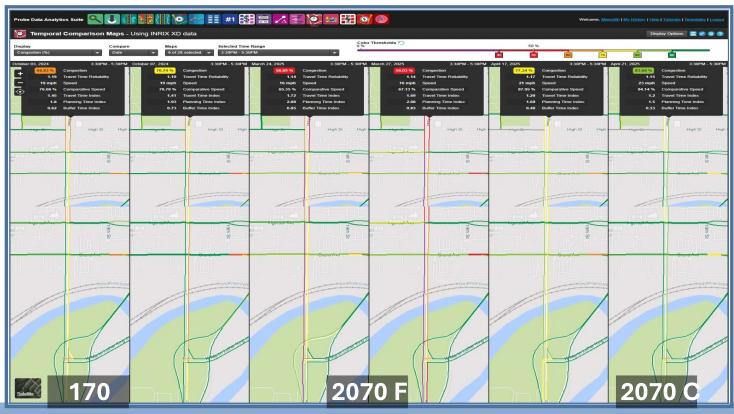




CITY OF DES MOINES

#### VISUAL VALIDATIONS







#### **CONGESTION COMPARE**

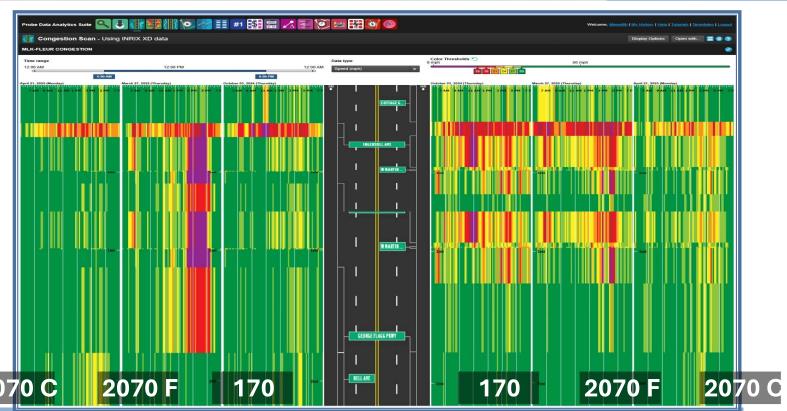






### SPEED COMPARE







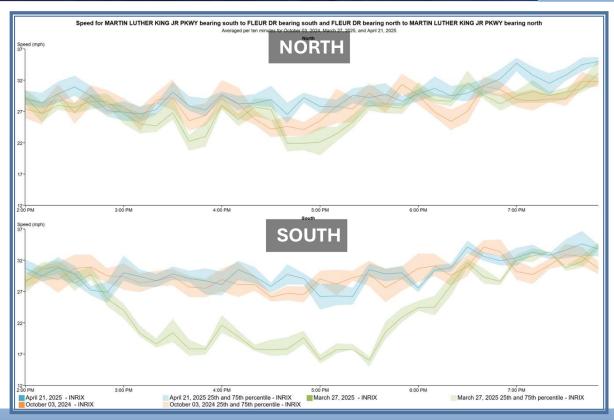
#### SPEED COMPARE



October 3, 2024

March 27, 2025

April 21, 2025





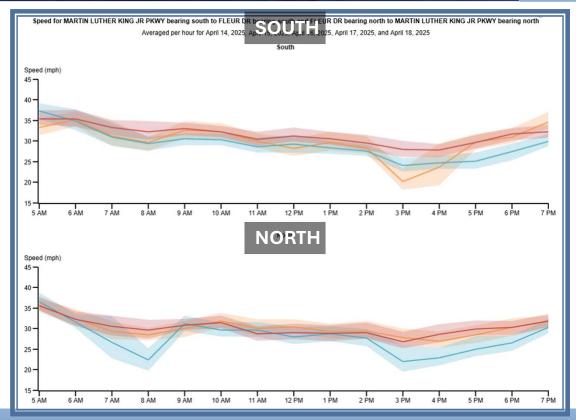
### SPEED COMPARE



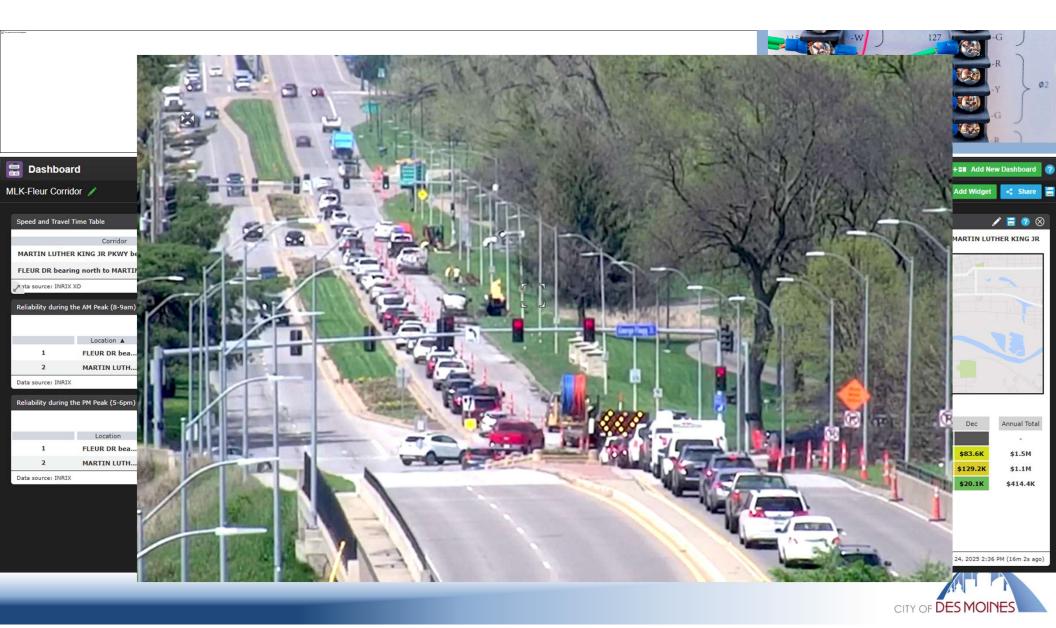
April 14

April 16

April 18







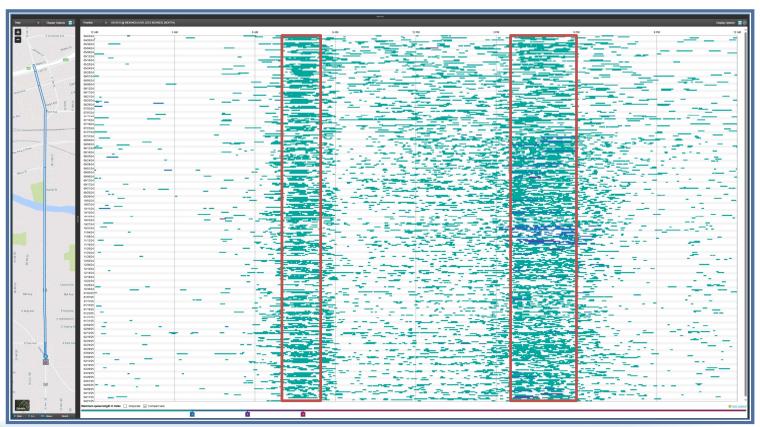
## DASHBOARD QUICK CHECKS



Das	shboard	d																						Select a Dashboard +≡■ Add New Dashi
sMoine	es-All 🥖																							+=   Add Widget   <
Ranked E	Sottleneck	Compariso	on																					/= 0
											2023 - 2025												Current Month	
May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Арг	Location
7	6	5	6	1	4	1	2	3	1	2	5	2	2	2	7	2	2	3	3	3	3	2	1	US-69 N @ E PARK AVE
-	18		=	-	-		-	1	-	-	-	-	-	11	-	-	19	-	20	-	19	4	2	FLEUR DR N @ W MARTIN LUTHER KING JR PKWY  GRAND AVE W @ HUBBELL AVE/E 18TH ST
-		9.50			-	100					14	4	4	5	13	6	4	2	-	-	-	(1)	A	COURT AVE E @ US-69/JOHNSON CT
9	5	11	12	10	5	2	3	2	2	3	3	•	1	1	8	3	1	1	2	2	2	3	5	US-69 S @ INDIANOLA AVE (DES MOINES) (NORTH)
2	-	-	-			-	-	- 2		-	-	12		-	=	- 2	-	-	13	-	-	6	6	US-6 E @ 2ND AVE
12	8		8	~	14	20		13	16	Ner		11	10	Ner	-	20	16	12	-	12	100	Ner	7	US-69 S @ MAURY ST
1	2	6	3	2	16	3	9		10	11	17	13	15	16	5	13	12	13	6	10	8	10	8	IA-28 N @ I-235
5	4	4	11	-	11	6	4	6	4	-	(FE)	- 5	11	11	11	5	17	15	14	11	9	8	9	US-69 S @ NE 46TH AVE/NE BROADWAY AVE  IA-28 S @ GRAND AVE
19	11	20	20	4	10	12	15	11	18	9	19	17	-	14	19	16	8	11	8	7	7	12	11	DADE AVE W @ TA-28
8	19	-	15	8	6	16	16	9	6	12	7	19	5	3	10	(1)	3	9	15	9	5	9	12	HICKMAN RD E @ 6TH AVE
4	9	8	18	-	13	5(=1	=	15	-	18	8	8	7	10	-	150	13	17	7	150	15	19	13	2ND N @ CRAND AVE
2	-	-	-	17	12	14	19		-	20	-	2	-		-		-	8	12	8	10	13	14	COTTAGE GROVE AVE W @ 19TH ST
1	2	6	3	2	16	3	9	2	10	11	17	13	15	16	2	13	12	13	6	10	8	10	8	IA-28 N @ I-235
6	(5)	1070	73	- 5	1711	1070	7.		170	1570	7	15	170	11	11	5	17	15	5	6	170	1070	9	US-69 S @ NE 46TH AVE/NE BROADWAY AVE
5	4	4	11	3	11	6	4	6	4	5	1	5	11	7	-	=	15	7	14	11	9	8	10	IA-28 S @ GRAND AVE
19	11	20	20	4	10	12	15	11	18	9	19	17	(50)	14	19	16	8	11	8	7	7	12	11	PARK AVE W @ IA-28
8	19		15	8	6	16	16	9	6	12	7	19	5	3	10	1	3	9	15	9	5	9	12	HICKMAN RD E @ 6TH AVE
4	9	8	18	-	13	150	-			18	8	8	7	10	-		13	17	7	-	15	19	13	2ND N @ GRAND AVE
2	-	-	5	17	12	14	19	2	-	20	5	2	~	-	2	2	-	8	12	8	10	13	14	COTTAGE GROVE AVE W @ 19TH ST
-	-	-	-	-	-	0-1	-	5	140	0-1	-	-	14.0	-	-	-	-	0-1	-	-	140	-	15	FLEUR DR N @ BELL AVE
11	7	16	7	5	9	8	8	20	5	6	9	3	18		14	9	7	10	5	æ	14	18	16	IA-163 E @ HUBBELL AVE
ù.	927	194	-	2	-	-	-	2	927	-	-	2	97	100	-	4	92	-	-	19	17	16	17	MARTIN LUTHER KING JR PKY N @ INGERSOLL AVE
8	-	-	17	7	7	7	7	*	11	10				-	-	+	-	-		16	) <del>-</del> (	-	18	IA-28 N @ I-80/I-35
=	-	97.		-		9 <del>-</del> 3			-	55-5		12	19	15		-		-		5	12	17	19	SCOTT AVE W @ US-69/SE 14TH ST
2	-	-	3	2	20	17	13	2	12	19	٥	2	27	12	2	2		-	3	2	27	12	20	IA-28 S @ I-80/I-35
nking	1 2	3																						
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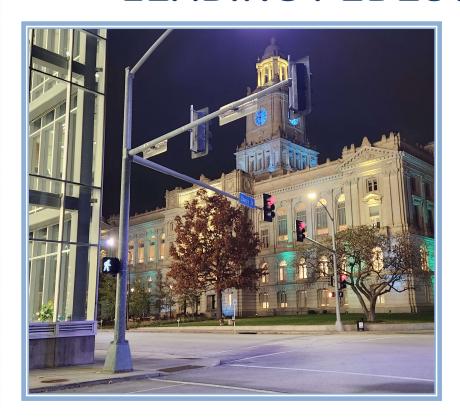
## BOTTLENECKS OF A FULL YEAR: SE 14<sup>th</sup> SB @ Indianola

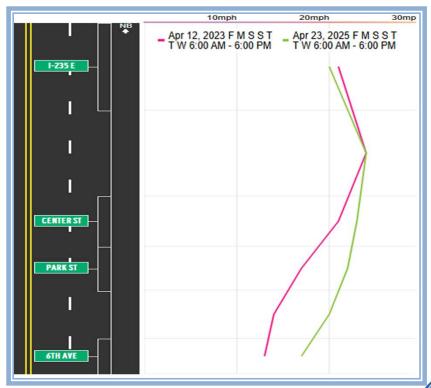






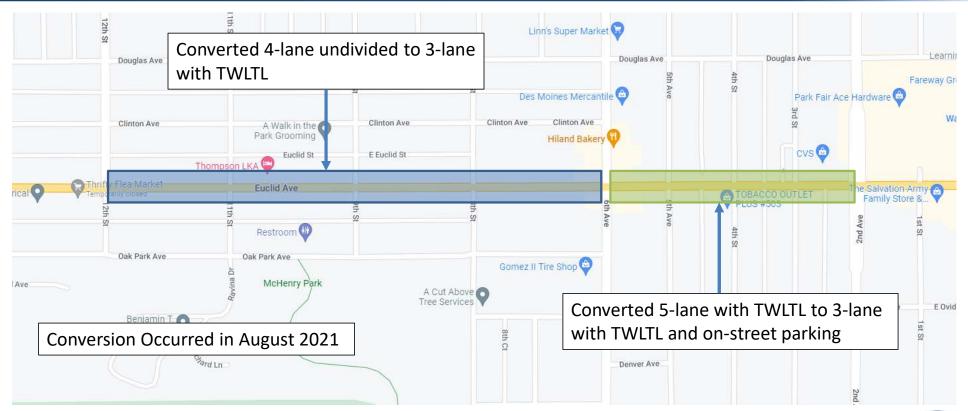
#### **LEADING PEDESTRIAN INTERVALS**





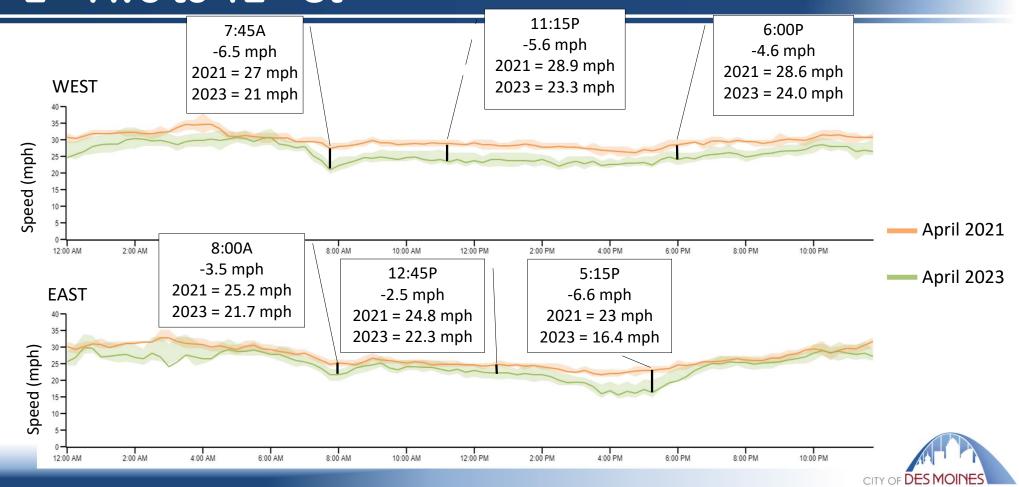
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#### **EUCLID AVENUE TEMPORARY ROAD DIET**

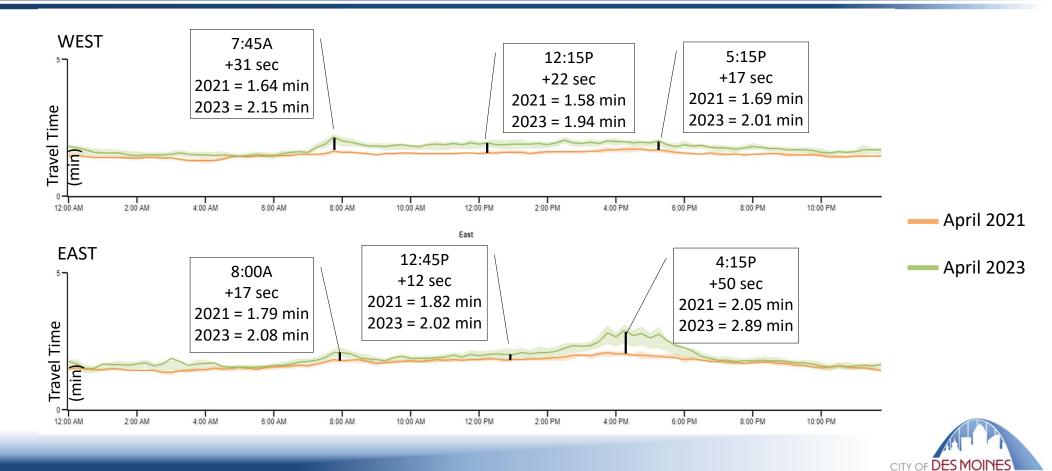


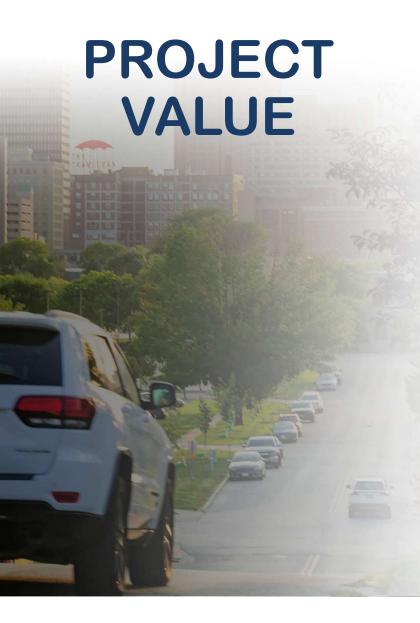


## AVERAGE SPEED COMPARISON: 2<sup>nd</sup> Ave to 12<sup>th</sup> St



## AVERAGE TRAVEL TIME COMPARISON: 2<sup>nd</sup> Ave to 12<sup>th</sup> St





#### **Before/After Evaluation**

Easy before/after performance evaluation of corridors for project effectiveness.

#### **Data-Driven Signal Retiming Program**

Match resources to measured biggest needs across an area.

#### **Proactive Traffic Management**

Monitor for operational changes through dashboards for quick response.

#### **Congestion Analysis**

Easy query of data for analysis or visual representation.

#### **Model/Simulation Calibration**

Speed, travel time, delay and other metrics to calibrate existing conditions model/simulation to measured reality.

#### **Prioritized Troubleshooting**

Determine highest increase in delay, indicating a location to troubleshoot.

#### **Signal Control Evaluation**

Determine candidates for responsive or adaptive signal control.





Molly Long, PE, PTOE Principal Traffic Engineer mmlong@dmgov.org

