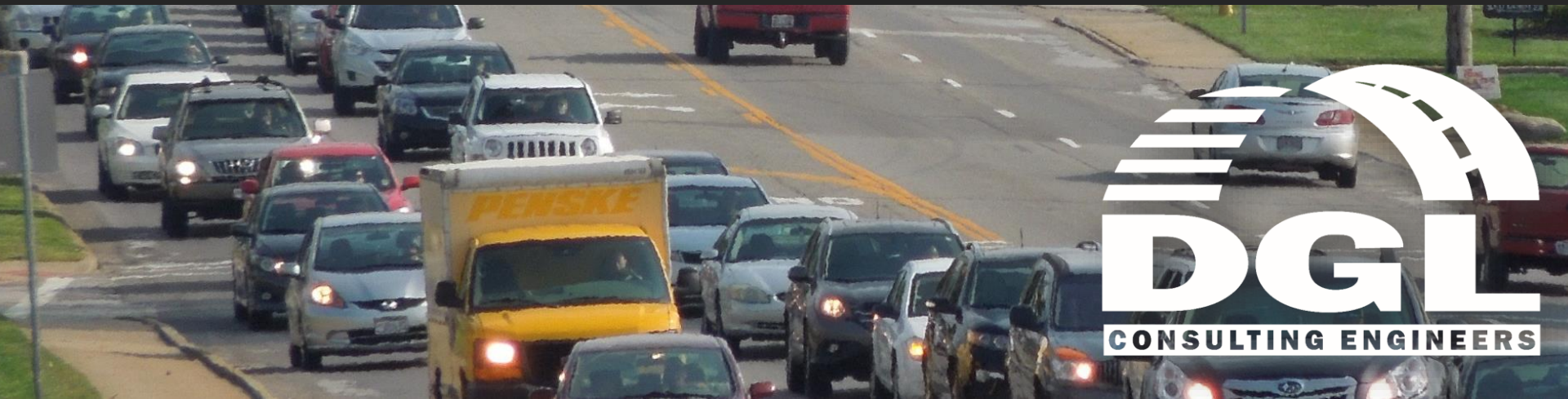
RE-TIMING CONGESTED CORRIDORS...

Increasing Capacity & Safety with Less Costs



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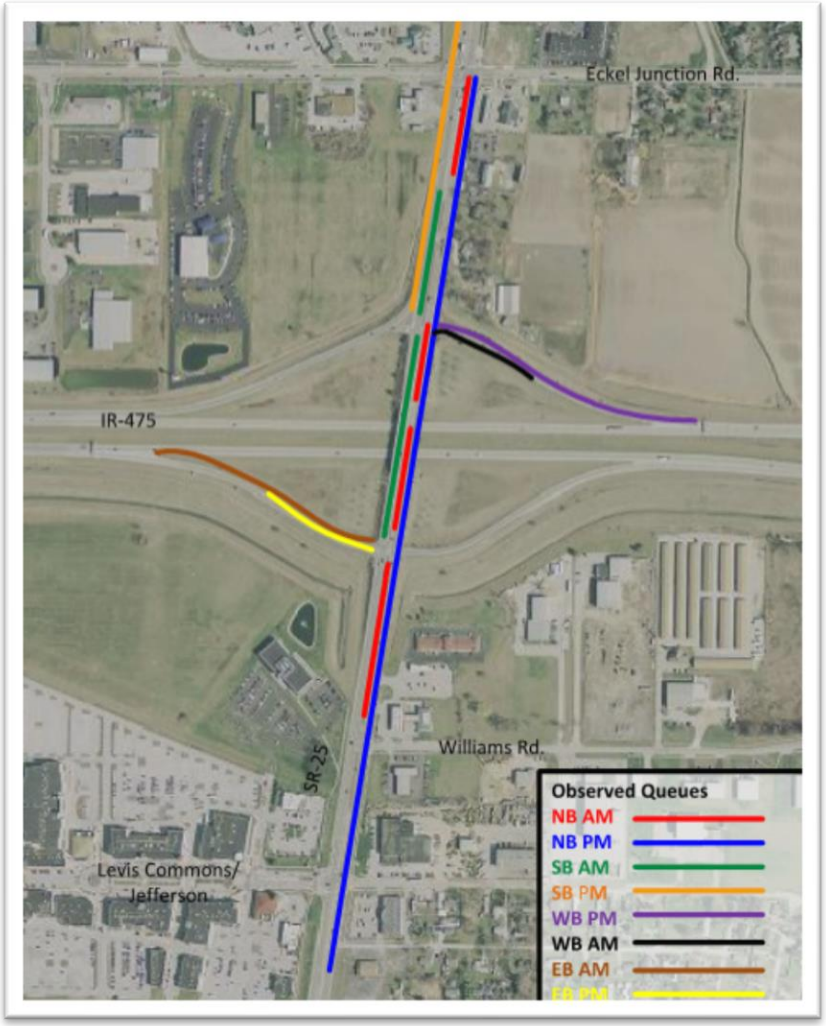
Congestion



A sign of success?

- More Retail
- More Residential
- More Industry

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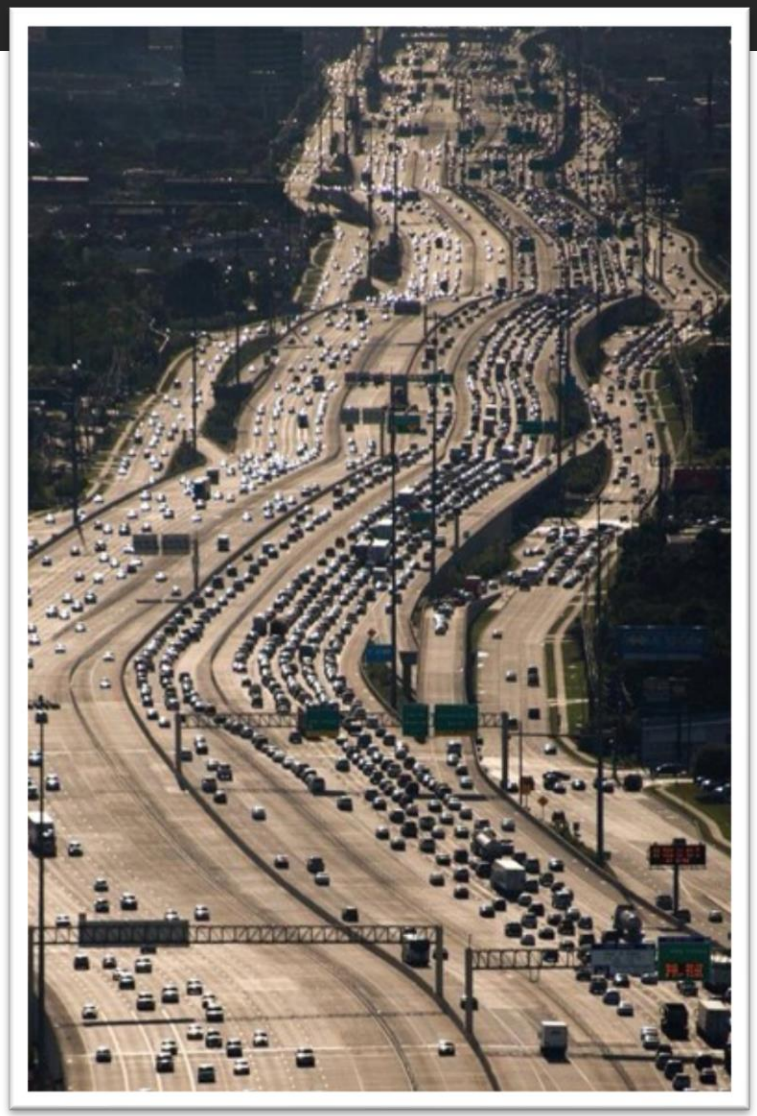
Balancing Needs

- Safer travel
- More efficient travel
- Accommodate all modes
- Access to home, work, shop

Increase Capacity



- Build More Lanes **$$$$**
- Restrict Access **$$$**
- Implement Adaptive Signal Systems **$$**

Low Cost Solution?

Retime Signals

$

Miami-Dade DTPW @GoMiamiDade · Feb 17

Thanks to our **retiming** of traffic **signals** project, the average travel time during peak hours has been reduced by 11 minutes on a segment of US-1 from SW 152nd Street and SW 16th Avenue. ow.ly/ImvU30isHn3

Megan Barry @MeganCBarry · 30 Dec 2016

ICYMI: @NashvillePW completes traffic **signal retiming** project to reduce travel-time delays across Nashville.

Nashville completes traffic light timing project

The traffic signal timing project synchronized 550 signals along 18 major Nashville pikes and corridors.

tennessean.com

Federal Highway Admn @USDOTFHWA

Follow

Signal retiming can improve traffic safety and operations, but highway agencies typically only retime signals on a 3- to 5- year cycle.

NBCWashington @nbcwashington · 5 Jan 2016

D.C. officials are **retiming** all 1,600 traffic lights in the District. Some **signals** haven't been changed for 30 yrs! nbc4dc.com/ipokjcE

1 8 6

Clear The Air @cleartheairutah · 26 Nov 2011

Get the scoop on #SLC's traffic **signal retiming** project, saving 337,00 gallons of gas a year! ow.ly/7BPCk @SLCMayorsOffice...

3 1

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Transportation Asset Management

- Use Technology
- Aggressive Preservation
- Collaboration

Transportation Asset Management (TAM)

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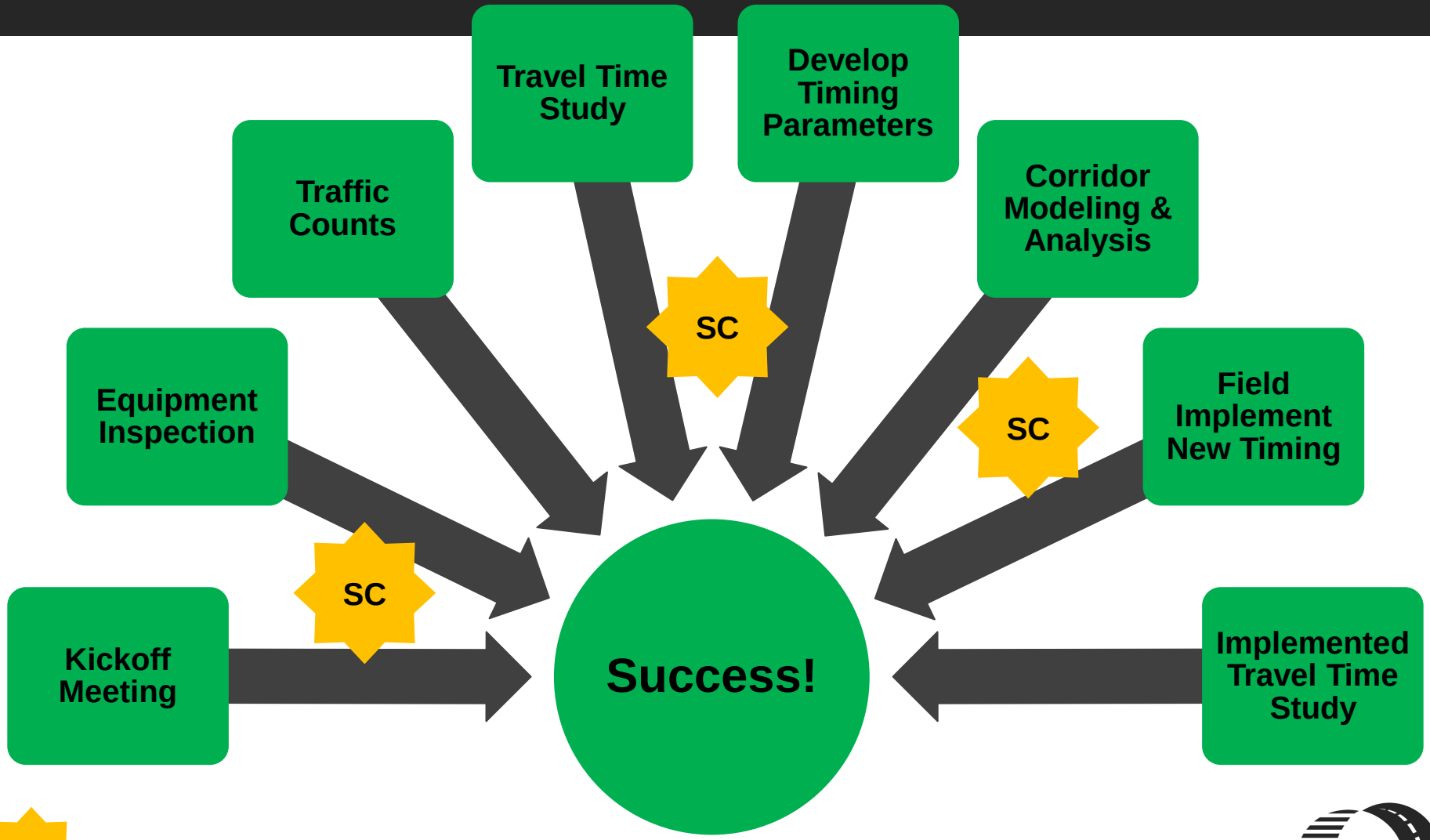
Take Care of What We Have

ODOT's STW-Signal Timing Task Order

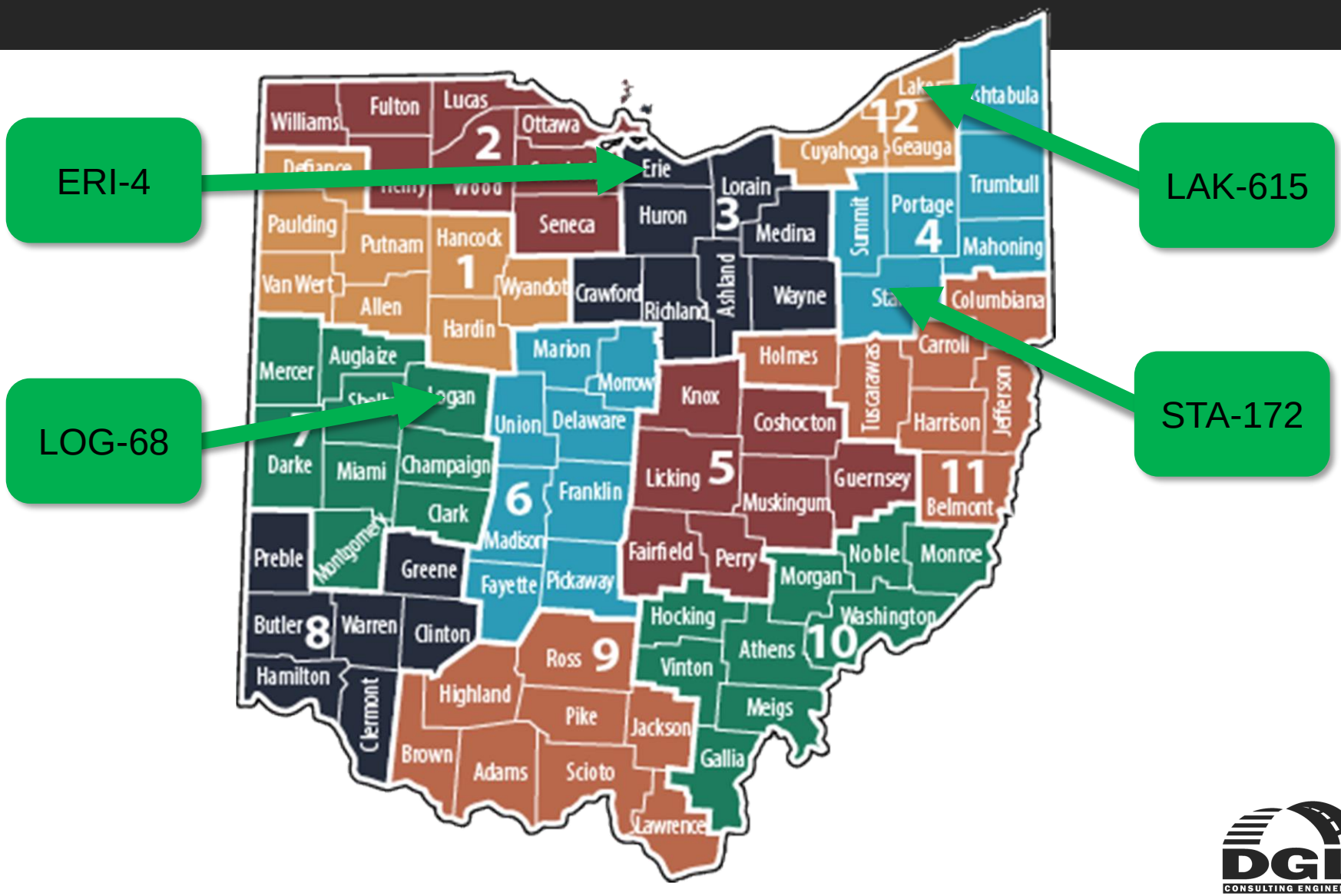
Collaborative Team: ODOT Central Office
DGL | ODOT District | Local Agencies

The Process

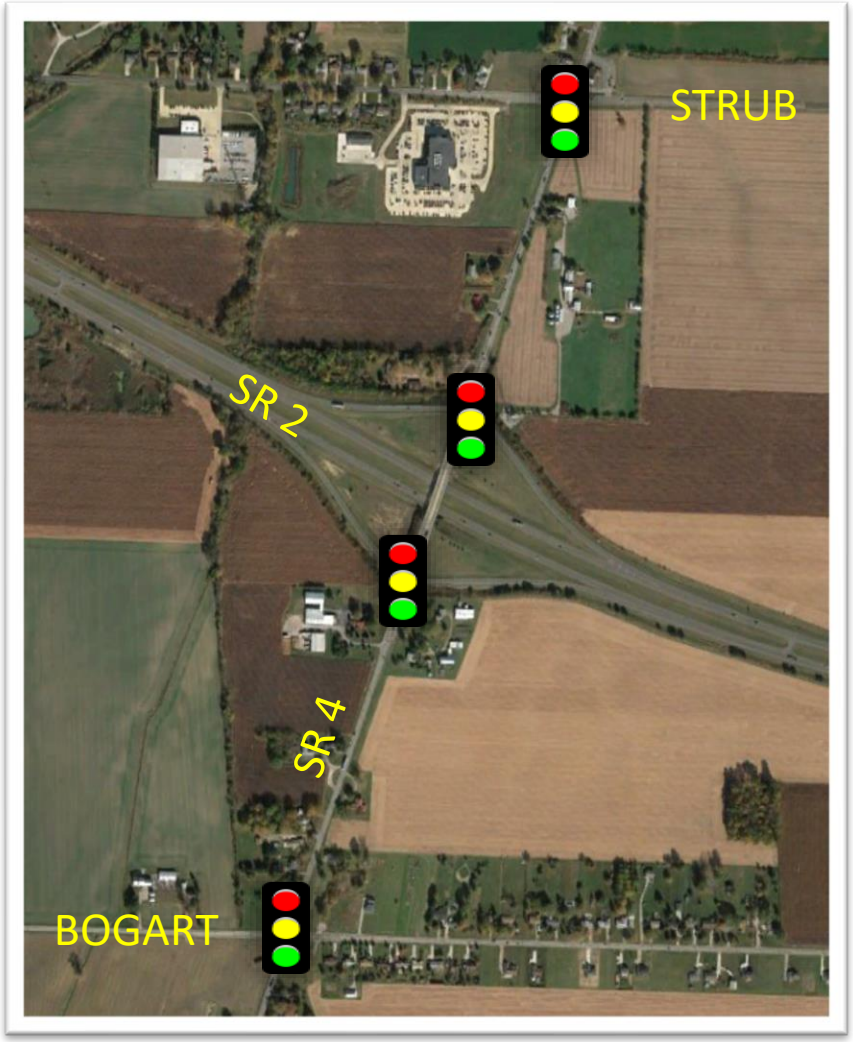


SC **Stakeholder Communication**

Success Stories



ERI-4



Stakeholders

- Office of Traffic Ops
- District 3
- DGL

Intersections

- SR-4 & Bogart Road
- SR-4 & SR-2 EB Ramps
- SR-4 & SR-2 WB Ramps
- SR-4 & Strub Road

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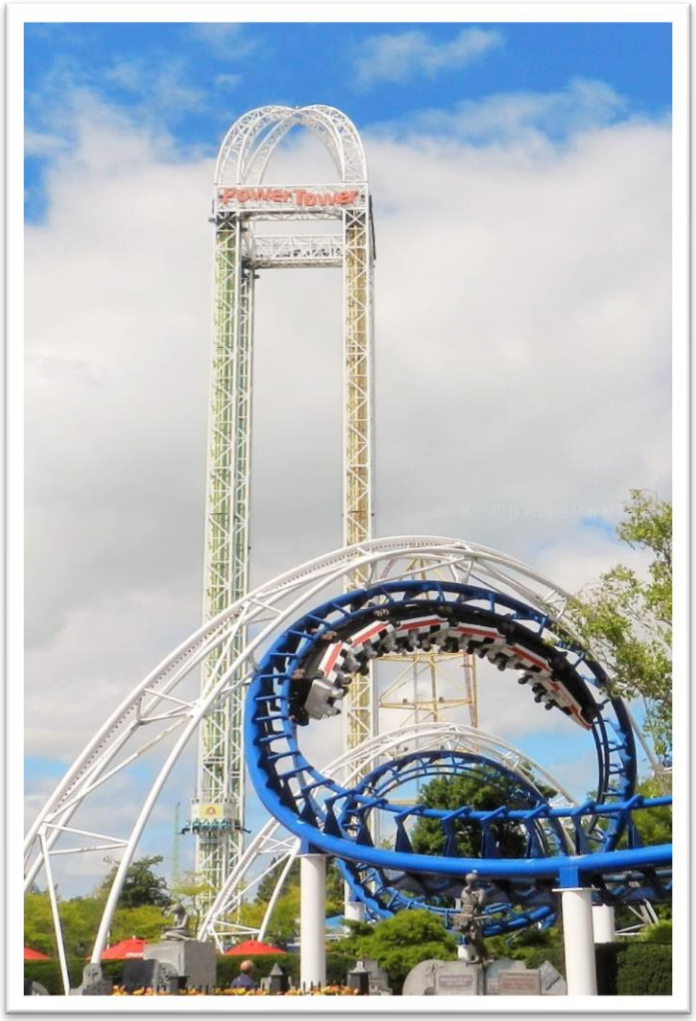
ERI-4



Unique Corridor Features

- Cedar Point Route
- Summer Traffic = 18,000 vpd
- Winter Traffic = 15,000 vpd
- 10 Analysis Periods
- Many rear end crashes

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ERI-4 Winter Intersection Operations

Winter													
Intersection		***SR-4 & Bogart Rd.***			***SR-4 & SR-2 EB Ramps***			***SR-4 & SR-2 WB Ramps***			***SR-4 & Strub Rd.***		
AM	Pre-Study	B	(10.2)		B	(12.2)		B	(10.7)		B	(15.7)	
	Optimized	B	(11.7)		B	(10.9)		A	(6.7)		B	(18.4)	
	% Change	15%			-11%			-37%			17%		
Off	Pre-Study	A	(7.8)		B	(10.6)		A	(7.4)		B	(12.4)	
	Optimized	A	(9.9)		B	(11.5)		B	(10.4)		B	(12.7)	
	% Change	27%			8%			41%			2%		
Mid-day	Pre-Study	A	(8.2)		A	(9.6)		A	(7.1)		B	(14.5)	
	Optimized	B	(11.8)		A	(9.3)		A	(6.2)		B	(19.6)	
	% Change	44%			-3%			-13%			35%		
PM	Pre-Study	B	(10.8)		B	(10.8)		A	(8.9)		B	(18.5)	
	Optimized	B	(15.2)		A	(9.8)		A	(6.1)		C	(20.8)	
	% Change	41%			-9%			-31%			12%		
Weekend	Pre-Study	A	(8.4)		A	(9.7)		A	(9.1)		B	(13.2)	
	Optimized	B	(13.6)		A	(8.7)		A	(9.1)		B	(18.2)	
	% Change	62%			-10%			0%			38%		

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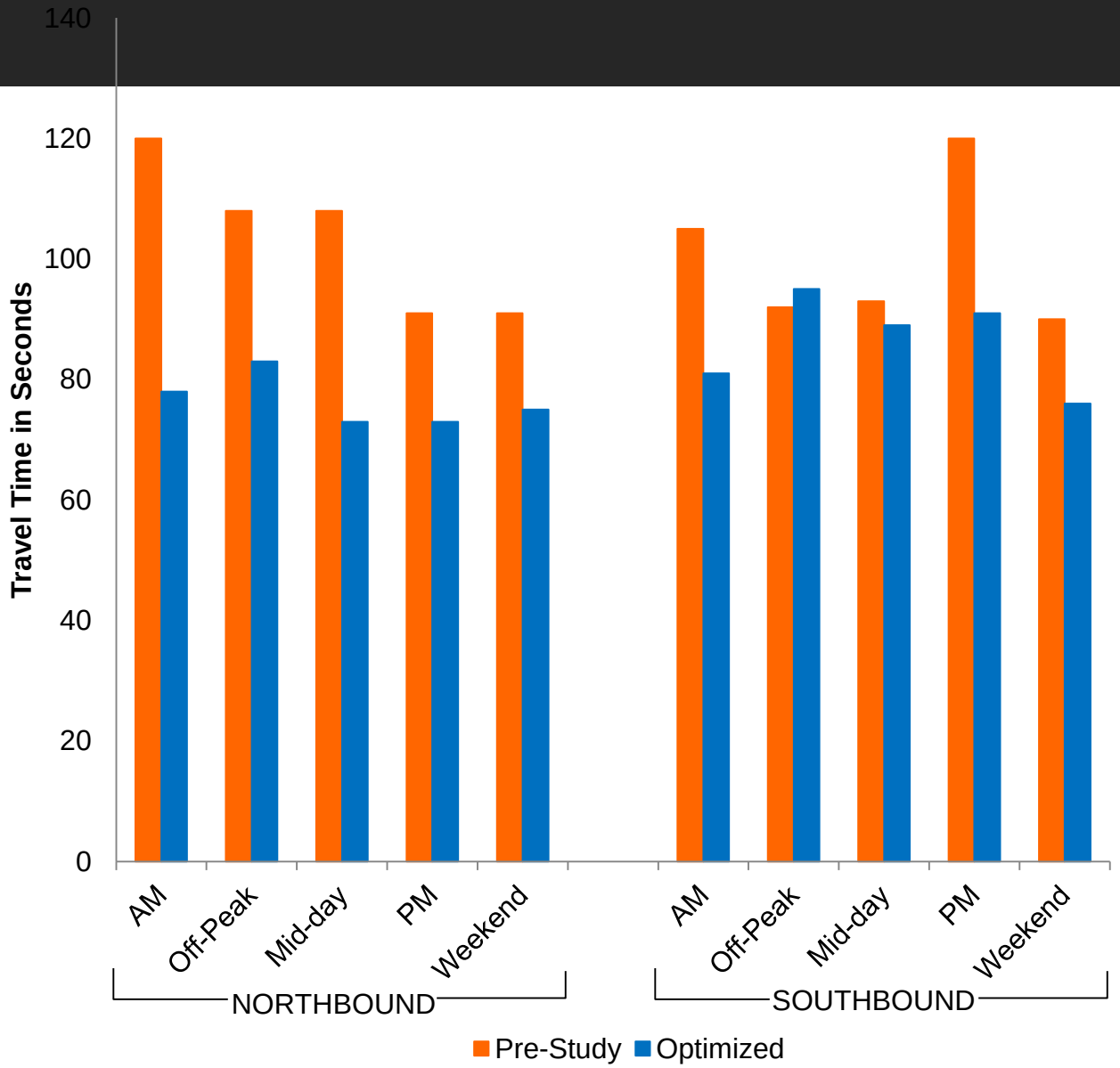
ERI-4 Winter Travel Time

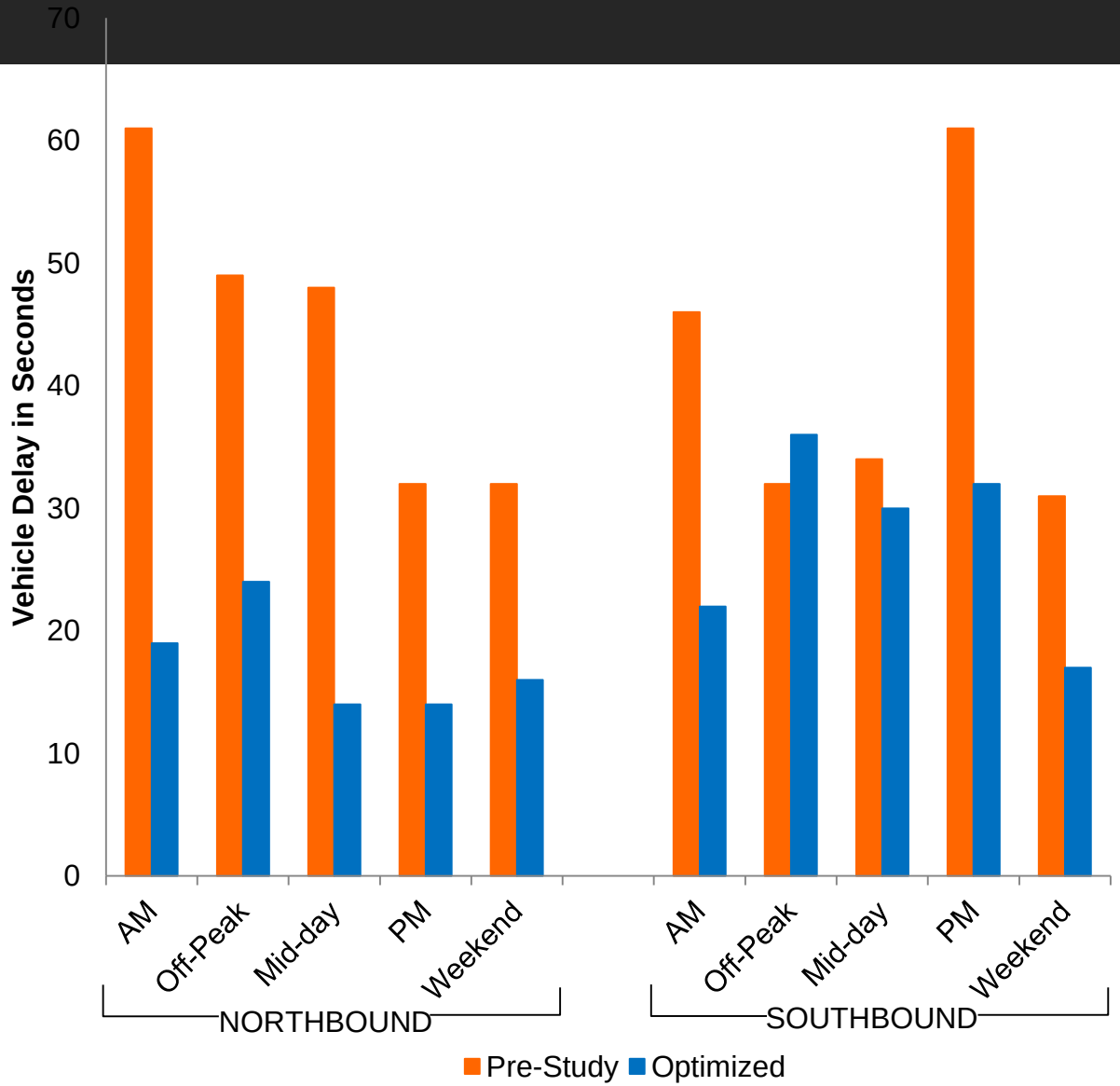


ERI-4 Winter Travel Time

NORTHBOUND		
AM Peak	-42 secs	35% reduction
Off-Peak	-25 secs	23% reduction
Mid-day Peak	-35 secs	32% reduction
PM Peak	-18 secs	19% reduction
Weekend Peak	-16 secs	18% reduction
SOUTHBOUND		
AM Peak	-23 secs	22% reduction
Off-Peak	3 secs	4% increase
Mid-day Peak	-5 secs	5% reduction
PM Peak	-29 secs	24% reduction
Weekend Peak	-14 secs	16% reduction

DGL CONSULTING ENGINEERS

ERI-4 Winter Vehicle Delay



ERI-4 Winter Vehicle Delay

NORTHBOUND		
AM Peak	-42 secs	69% reduction
Off-Peak	-25 secs	52% reduction
Mid-day Peak	-35 secs	72% reduction
PM Peak	-18 secs	55% reduction
Weekend Peak	-16 secs	50% reduction
SOUTHBOUND		
AM Peak	-23 secs	51% reduction
Off-Peak	3 secs	10% increase
Mid-day Peak	-5 secs	14% reduction
PM Peak	-29 secs	48% reduction
Weekend Peak	-14 secs	46% reduction

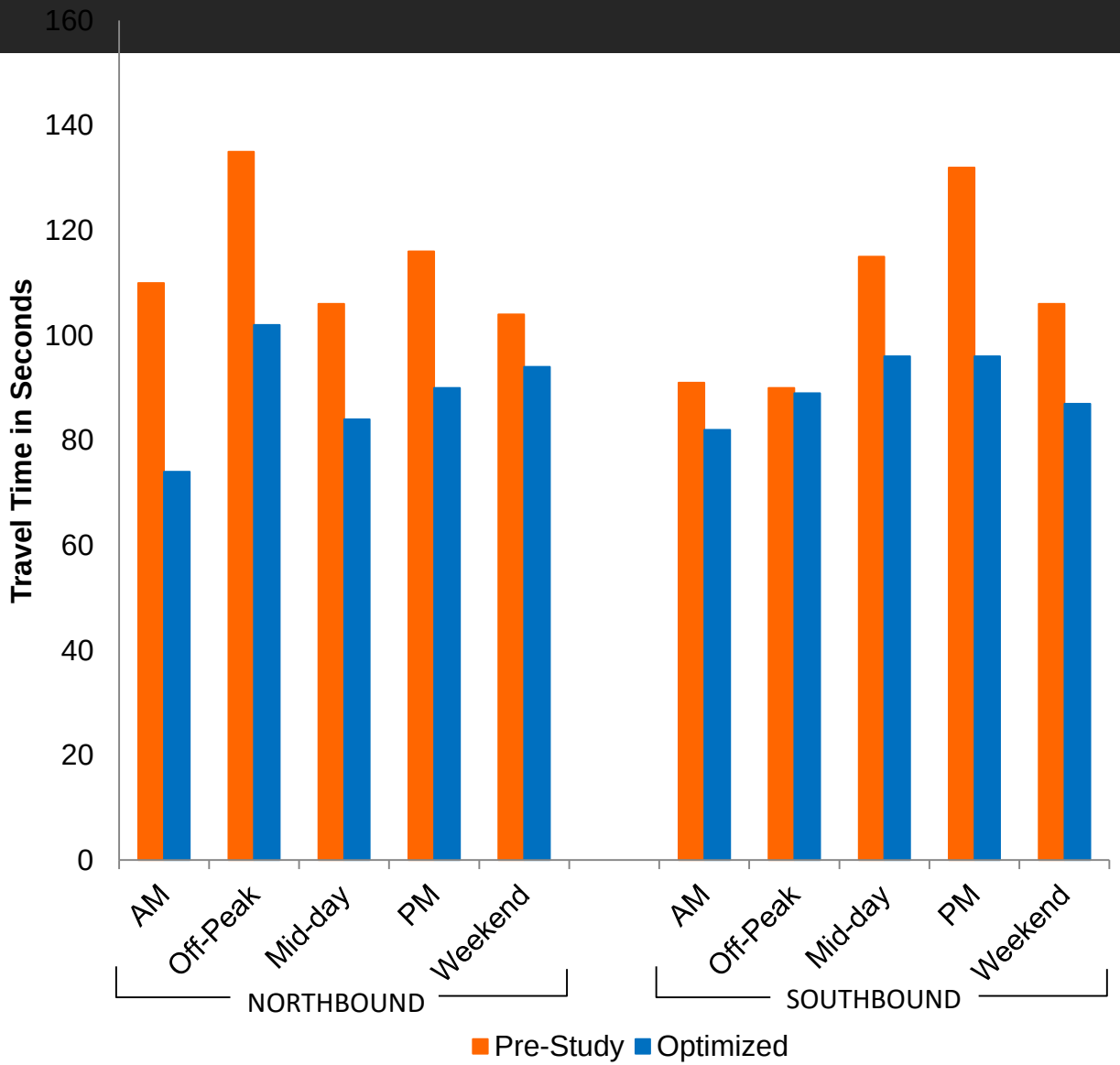
DGL CONSULTING ENGINEERS

ERI-4 Summer Intersection Operations

Summer					
Intersection		***SR-4 & Bogart Rd.***	***SR-4 & SR-2 EB Ramps***	***SR-4 & SR-2 WB Ramps***	***SR-4 & Strub Rd.***
AM	Pre-Study	B (11.2)	B (13.4)	B (14.0)	B (15.7)
	Optimized	B (12.4)	B (13.1)	A (7.9)	B (18.8)
	% Change	11%	-2%	-44%	20%
Off	Pre-Study	A (8.8)	B (13.5)	A (8.6)	B (14.6)
	Optimized	B (11.3)	B (11.9)	A (6.6)	B (14.7)
	% Change	28%	-12%	-23%	1%
Mid-day	Pre-Study	B (11.6)	B (12.6)	A (9.7)	B (17.8)
	Optimized	B (11.9)	B (11.9)	A (7.1)	C (20.2)
	% Change	3%	-6%	-27%	13%
PM	Pre-Study	B (13.9)	B (12.9)	B (10.1)	C (21.5)
	Optimized	B (19.3)	B (12.6)	A (8.1)	C (24.6)
	% Change	39%	-2%	-20%	14%
Weekend	Pre-Study	C (23.0)	B (15.5)	B (12.1)	C (20.8)
	Optimized	B (13.6)	B (11.2)	A (7.7)	B (18.0)
	% Change	-41%	-28%	-36%	-13%

DGL CONSULTING ENGINEERS

ERI-4 Summer Travel Time

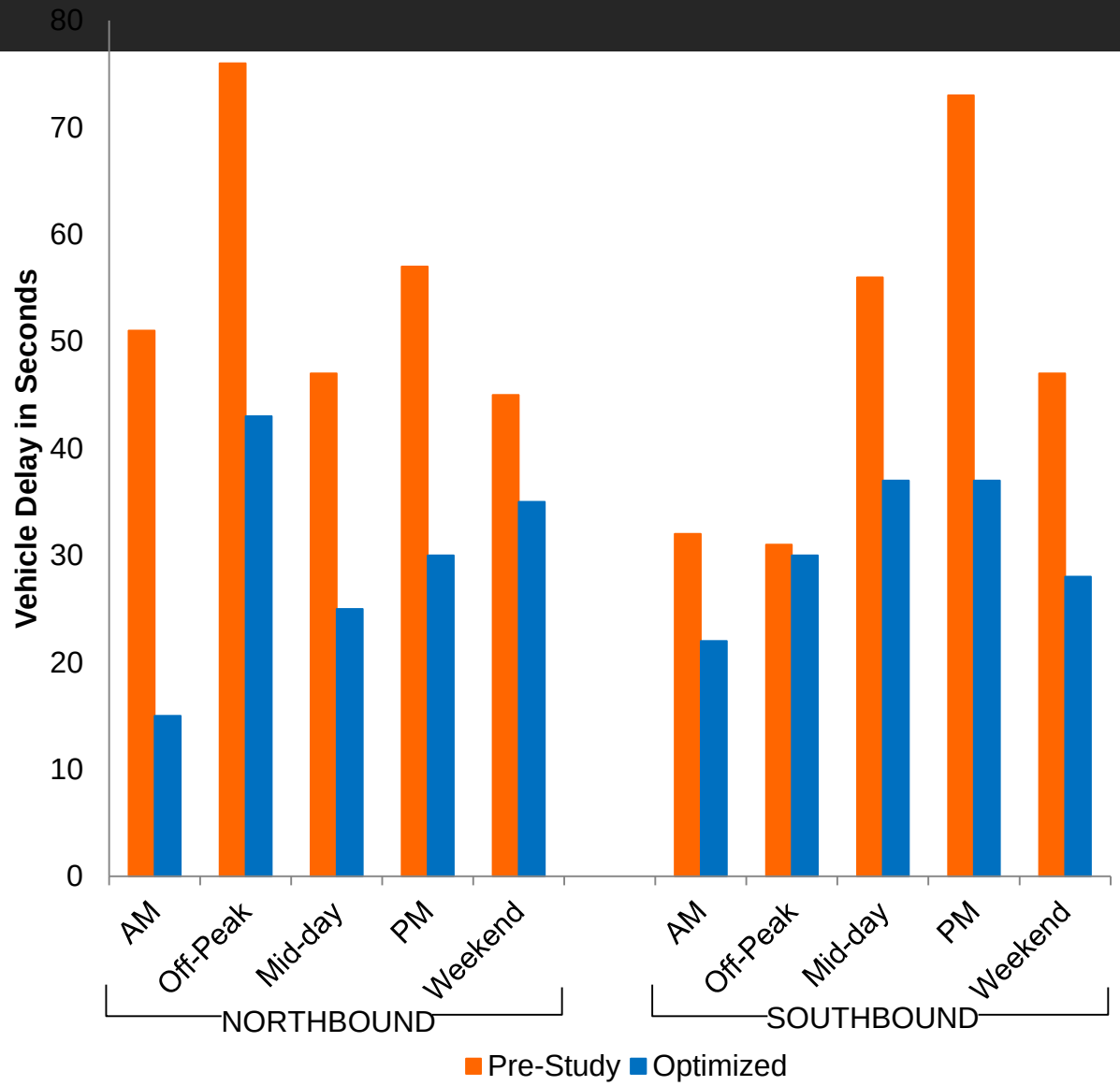


ERI-4 Summer Travel Time

NORTHBOUND		
AM Peak	-36 secs	32% reduction
Off-Peak	-33 secs	24% reduction
Mid-day Peak	-22 secs	21% reduction
PM Peak	-26 secs	23% reduction
Weekend Peak	-10 secs	9% reduction
SOUTHBOUND		
AM Peak	-10 secs	11% reduction
Off-Peak	-1 secs	1% reduction
Mid-day Peak	-18 secs	16% reduction
PM Peak	-36 secs	27% reduction
Weekend Peak	-19 secs	18% reduction

DGL CONSULTING ENGINEERS

ERI-4 Summer Vehicle Delay



ERI-4 Summer Vehicle Delay

NORTHBOUND		
AM Peak	-36 secs	70% reduction
Off-Peak	-33 secs	43% reduction
Mid-day Peak	-22 secs	47% reduction
PM Peak	-26 secs	46% reduction
Weekend Peak	-10 secs	22% reduction
SOUTHBOUND		
AM Peak	-10 secs	31% reduction
Off-Peak	-1 secs	3% reduction
Mid-day Peak	-18 secs	33% reduction
PM Peak	-36 secs	49% reduction
Weekend Peak	-19 secs	40% reduction

DGL CONSULTING ENGINEERS

ERI-4 Estimated Signal Retiming Benefits

Delay Savings

29,246 Hours
$597,331

Crash Reductions

3 Crashes
$68,920

Emissions Savings

1.8 kg
$4,029

Fuel Savings

5,723 Gallons
$10,873

Benefit Cost Ratio

24:1

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STA-172

Stakeholders

- Office of Traffic Ops
- District 4
- DGL

Intersections

- SR-172 & Austin
- SR-172 & Genoa
- SR-172 & Leonard
- SR-172 & Perry
- SR-172 & Bordner*
- SR-172 &Woodlawn
- SR-172 & Whipple

STA-172

Unique Corridor Features

- 2.7 mile corridor
- 7 signals
- 2 schools
  - St Joan of Arc K-8
  - Canton Central Catholic
- Heavily commercial
- 25,300 vpd

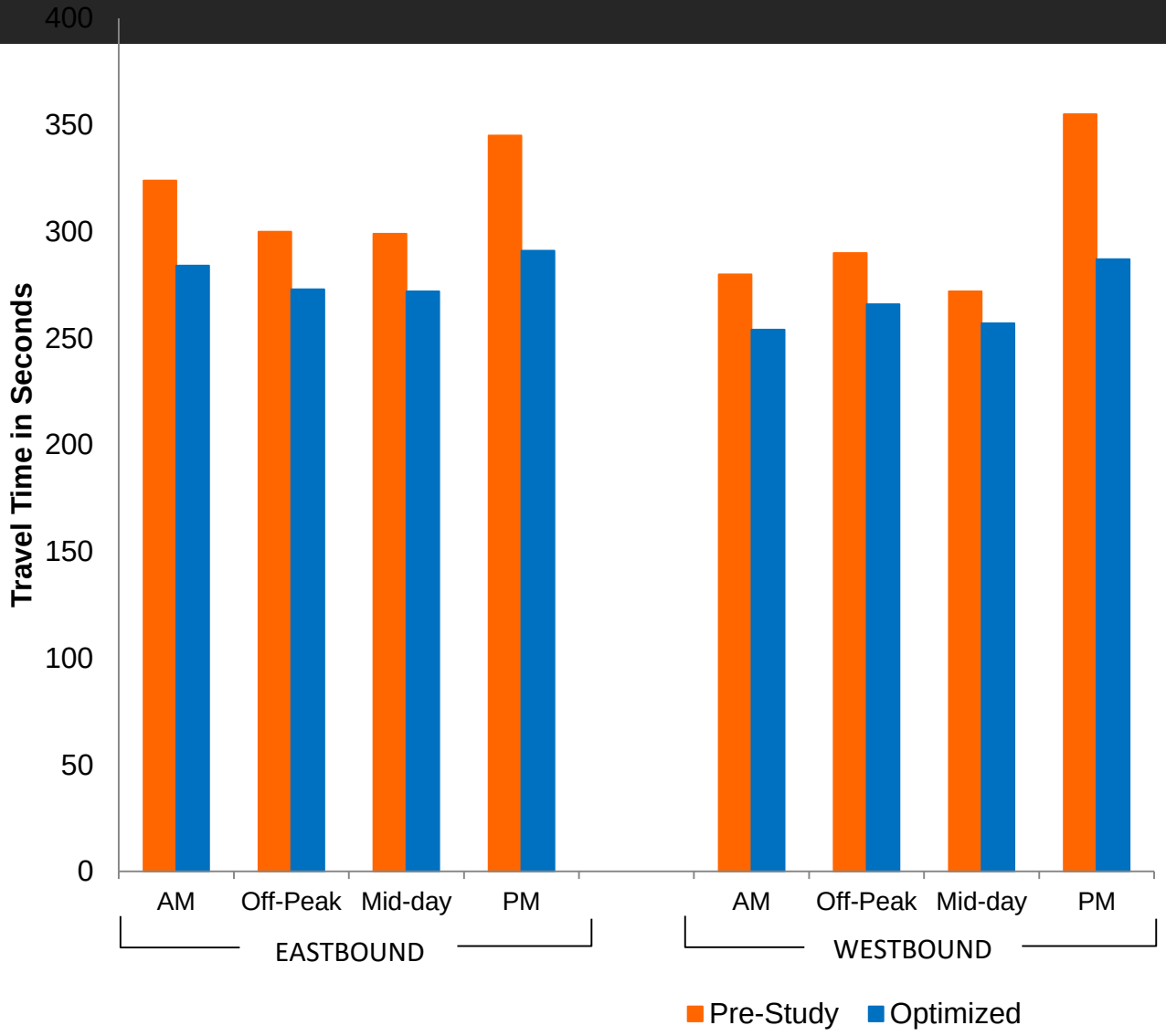
STA-172 Traffic Operations

Intersection		*SR-172 & Austin Ave.*	*SR-172 & Genoa Ave.*	*SR-172 & Leonard Ave.*	*SR-172 & Perry Dr.*	*SR-172 & Bordner Ave.*	*SR-172 & Woodlawn Ave*	*SR-172 & Whipple Ave.*
AM	Pre-Study	A 2.9	C 21.9	A 5.1	C 33.0	A 2.9	B 15.8	B 16.9
	Optimized	A 3.3	C 23.2	A 4.4	C 29.7	A 1.6	B 14.5	B 15.8
	% Change	14%	6%	-14%	-10%	-45%	-8%	-7%
Off	Pre-Study	A 4.9	B 17.7	A 3.4	D 37.4	A 0.3	A 7.6	B 17.9
	Optimized	A 3.8	B 19.4	A 1.5	C 29.2	A 0.9	A 8.0	B 17.0
	% Change	-22%	10%	-56%	-22%	200%	5%	-5%
Mid-day	Pre-Study	A 3.1	B 19.3	A 3.4	C 33.6	A 0.2	B 10.2	B 19.6
	Optimized	A 2.5	C 20.0	A 1.7	C 30.2	A 1.4	A 9.8	C 20.4
	% Change	-19%	4%	-50%	-10%	600%	-4%	4%
PM	Pre-Study	A 4.2	C 26.6	A 4.8	D 40.9	A 0.3	B 18.1	C 22.8
	Optimized	A 3.1	C 26.8	A 4.6	D 43.3	A 2.3	B 14.8	C 22.2
	% Change	-26%	1%	-4%	6%	667%	-18%	-3%

ASSUMES Full Time Operation

DGL CONSULTING ENGINEERS

STA-172 Travel Time

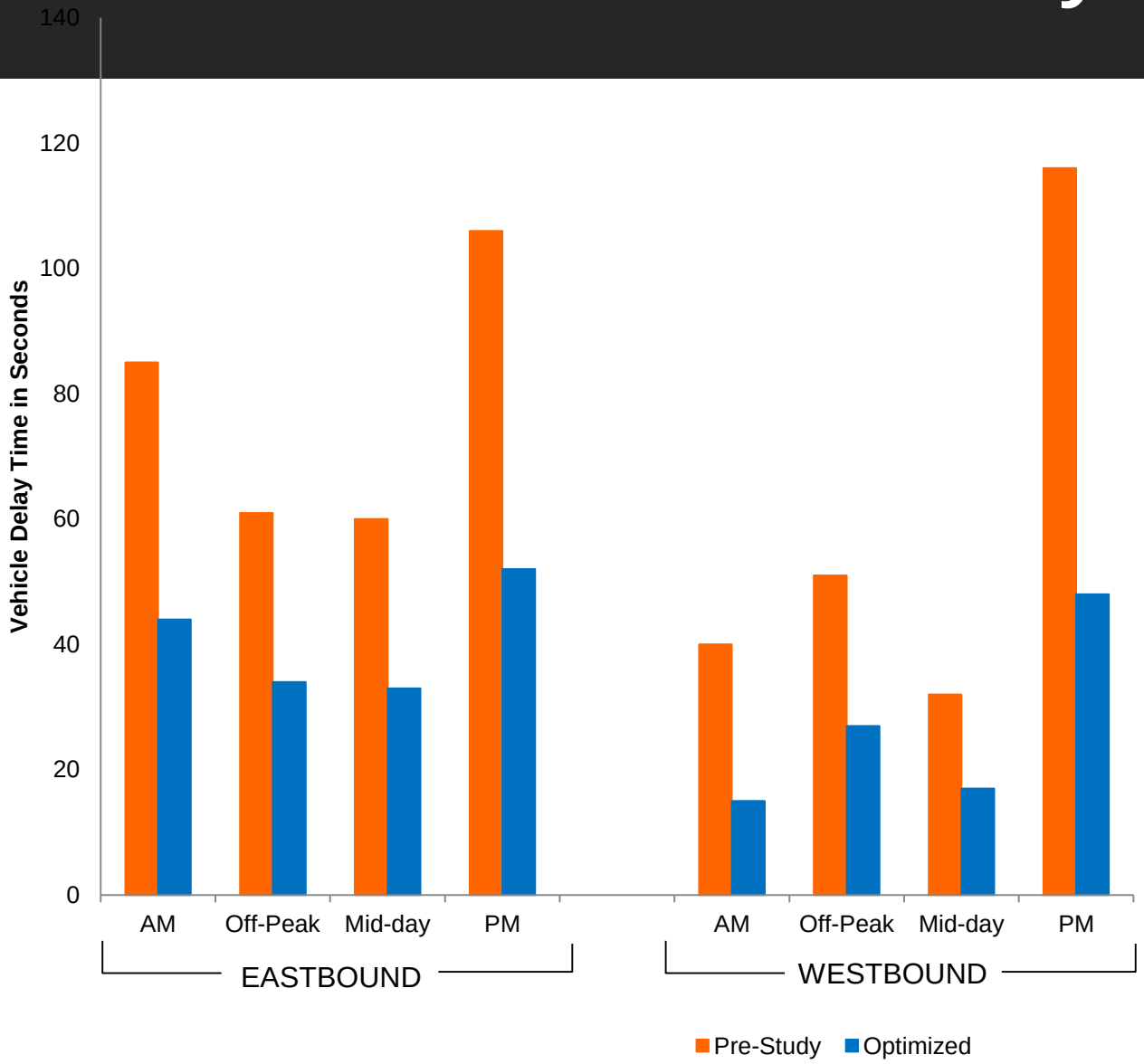


STA-172 Travel Time

EASTBOUND		
AM Peak	-40 secs	13% reduction
Off-Peak	-27 secs	9% reduction
Mid-day Peak	-27 secs	9% reduction
PM Peak	-54 secs	16% reduction
WESTBOUND		
AM Peak	-26 secs	9% reduction
Off-Peak	-24 secs	8% reduction
Mid-day Peak	-15 secs	6% reduction
PM Peak	-68 secs	19% reduction

DGL CONSULTING ENGINEERS

STA-172 Vehicle Delay



STA-172 Vehicle Delay

EASTBOUND		
AM Peak	-41 secs	48% reduction
Off-Peak	-27 secs	45% reduction
Mid-day Peak	-27 secs	45% reduction
PM Peak	-54 secs	51% reduction
WESTBOUND		
AM Peak	-25 secs	64% reduction
Off-Peak	-24 secs	47% reduction
Mid-day Peak	-15 secs	47% reduction
PM Peak	-68 secs	59% reduction

DGL CONSULTING ENGINEERS

STA-172 Estimated Signal Retiming Benefits

Delay Savings

71,812 Hours

$1,322,170

Crash Reductions

5 Crashes

$107,871

Emissions Savings

3.9 kg

$7,346

Fuel Savings

14,609 Gallons

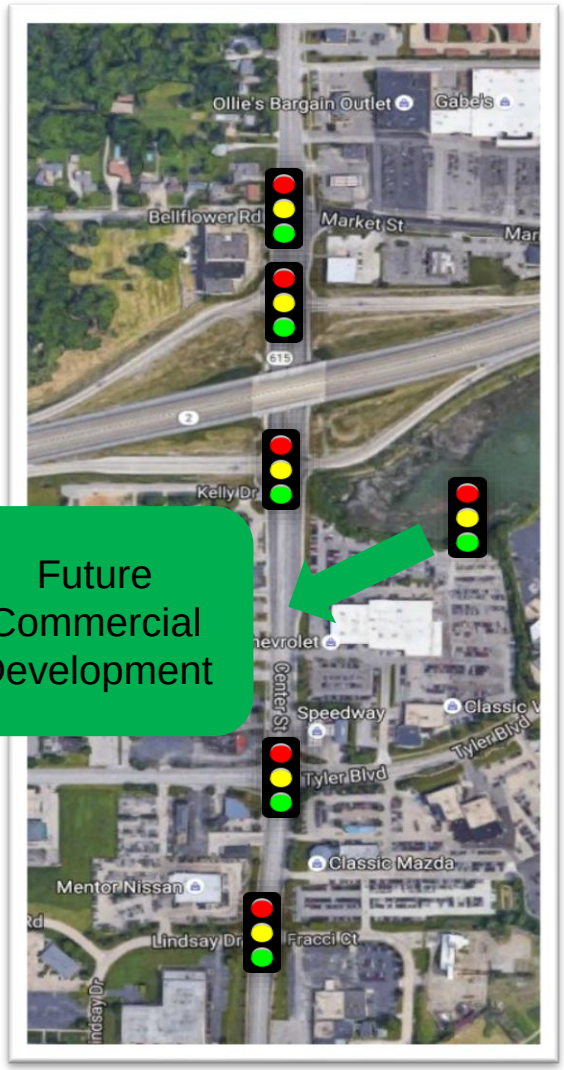
$27,757

Benefit Cost Ratio

47:1

DGL CONSULTING ENGINEERS

LAK-615



Stakeholders

- Office of Traffic Ops
- District 12
- City of Mentor
- DGL

Intersections

- SR-615 & Lindsey/Fracci
- SR-615 & Tyler
- SR-615 & SR-2 EB Ramps
- SR-615 & SR-2 WB Ramps
- SR-615 & Bellflower/Market

Note: Signal added with future development

LAK-615

Unique Corridor Features

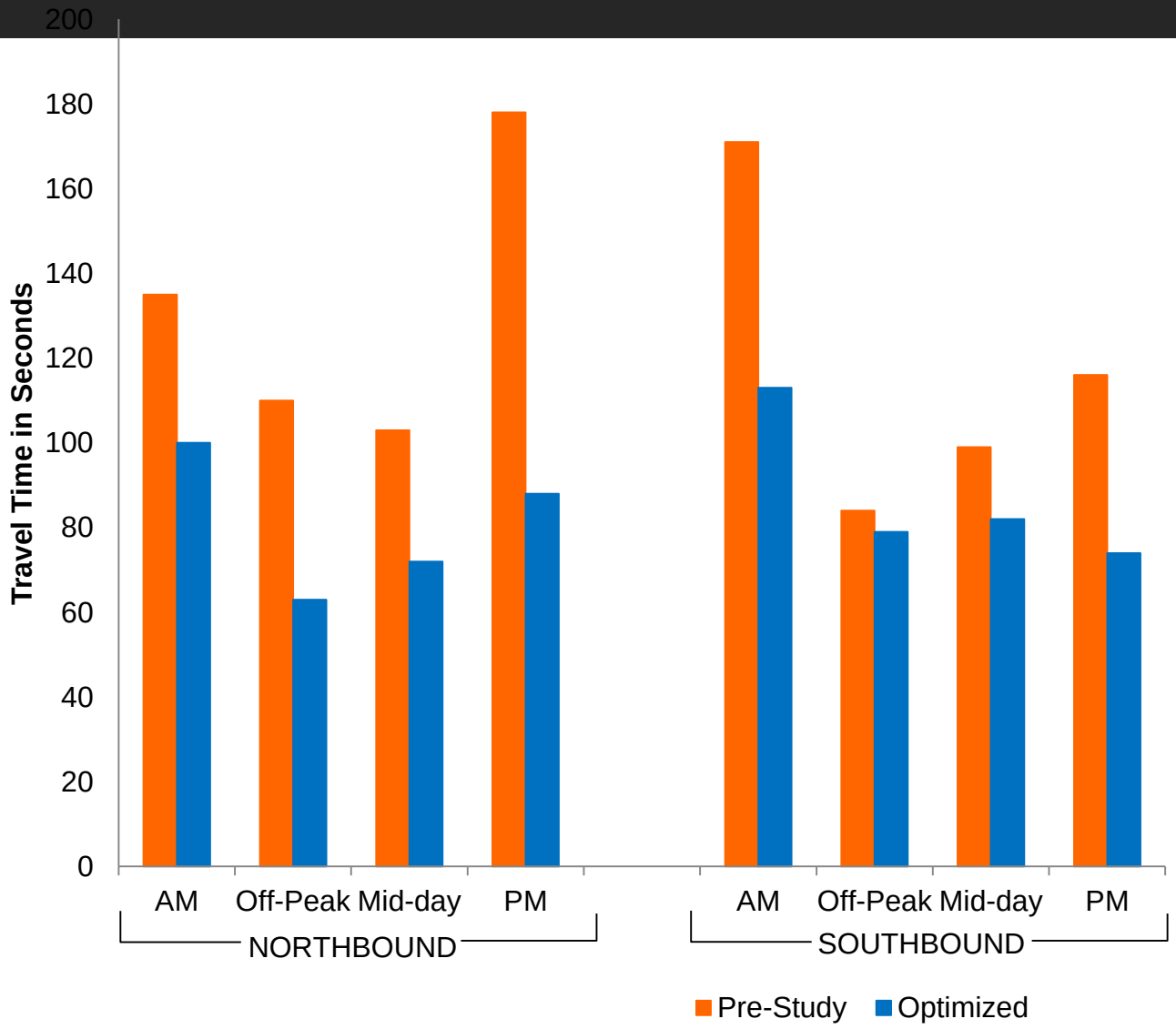
- Very heavy traffic volumes
- Distinct AM / PM traffic splits
- Heavily commercial / car dealerships
- Large Commercial Development proposed
- 37,700 vpd

LAK-615 Traffic Operations

Intersection		SR-615 & Fracci Ct. / Lindsay Dr.	SR-615 & Tyler Blvd.	SR-615 & EB SR-2	SR-615 & WB SR-2	SR-615 & Bellflower Rd. / Market St.
AM	Pre-Study	A (2.2)	D (35.1)	C (26.3)	C (30.6)	C (33.9)
	Optimized	A (1.9)	C (25.6)	C (20.1)	C (30.4)	C (27.2)
	% Change	-14%	-27%	-24%	-1%	-20%
Off	Pre-Study	A (2.9)	B (20.0)	B (17.4)	B (19.8)	B (18.9)
	Optimized	A (2.9)	C (20.5)	B (12.6)	B (16.1)	B (14.3)
	% Change	0%	3%	-28%	-19%	-24%
Mid-day	Pre-Study	A (5.5)	C (29.3)	B (17.9)	C (20.1)	B (19.9)
	Optimized	A (6.0)	C (32.2)	B (12.5)	B (16.0)	B (17.2)
	% Change	9%	10%	-30%	-20%	-14%
PM	Pre-Study	A (8.7)	E (57.2)	C (27.0)	C (28.3)	C (29.9)
	Optimized	A (8.1)	D (44.9)	C (21.6)	B (19.5)	C (23.4)
	% Change	-7%	-22%	-20%	-31%	-22%

DGL CONSULTING ENGINEERS

LAK-615 Travel Time

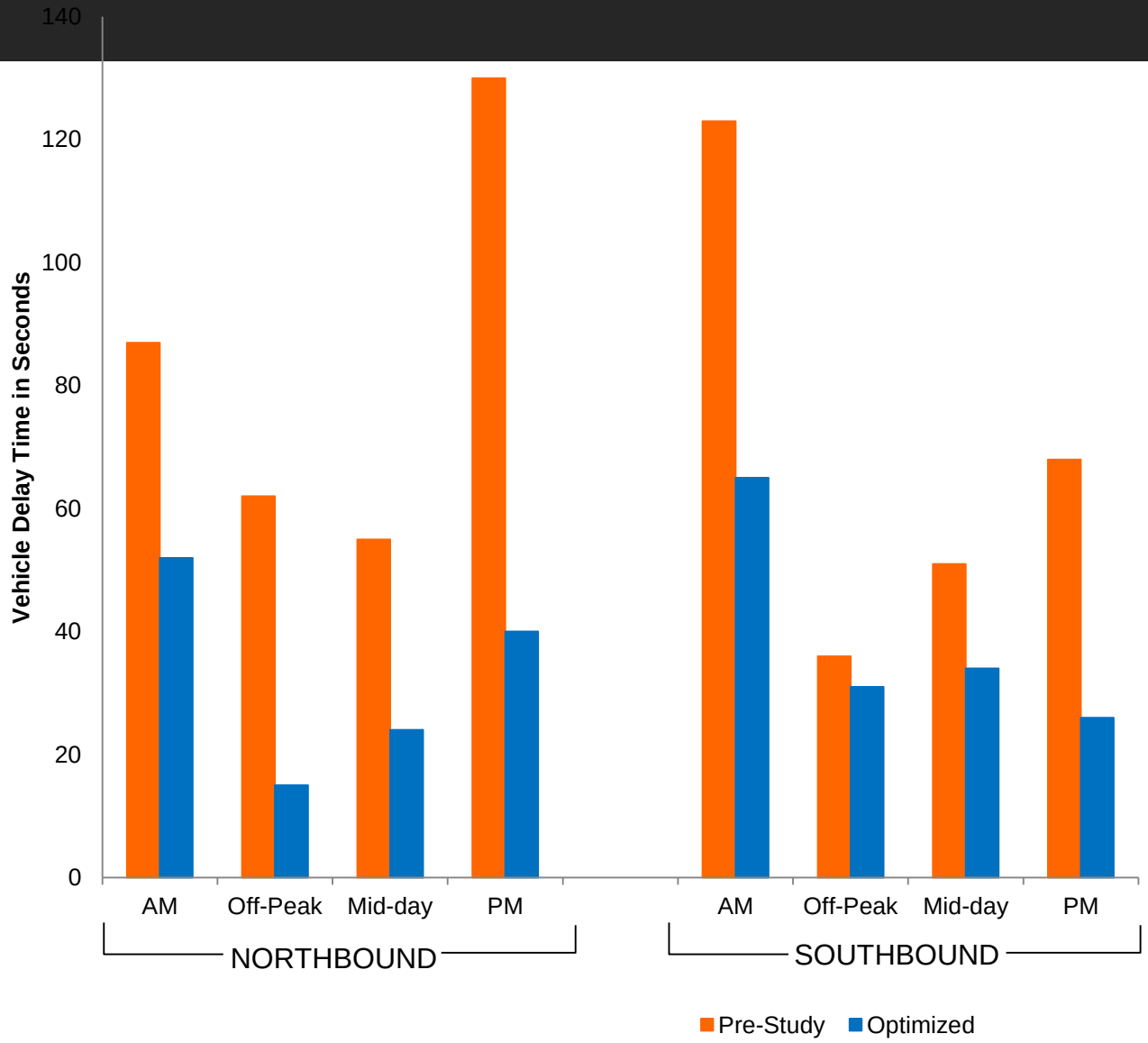


LAK-615 Travel Time

NORTHBOUND		
AM Peak	35 secs	26% reduction
Off-Peak	47 secs	43% reduction
Mid-day Peak	31 secs	30% reduction
PM Peak	90 secs	51% reduction
SOUTHBOUND		
AM Peak	58 secs	34% reduction
Off-Peak	5 secs	6% reduction
Mid-day Peak	17 secs	18% reduction
PM Peak	42 secs	36% reduction

DGL CONSULTING ENGINEERS

LAK-615 Vehicle Delay



LAK-615 Vehicle Delay

NORTHBOUND		
AM Peak	35 secs	40% reduction
Off-Peak	47 secs	75% reduction
Mid-day Peak	31 secs	56% reduction
PM Peak	90 secs	69% reduction
SOUTHBOUND		
AM Peak	58 secs	47% reduction
Off-Peak	5 secs	13% reduction
Mid-day Peak	17 secs	34% reduction
PM Peak	42 secs	62% reduction

DGL CONSULTING ENGINEERS

LAK-615 Estimated Signal Retiming Benefits

Delay Savings

126,914 Hours

$2,265,226

Crash Reductions

3 Crashes

$60,178

Emissions Savings

2.7 kg

$4,249

Fuel Savings

8,708 Gallons

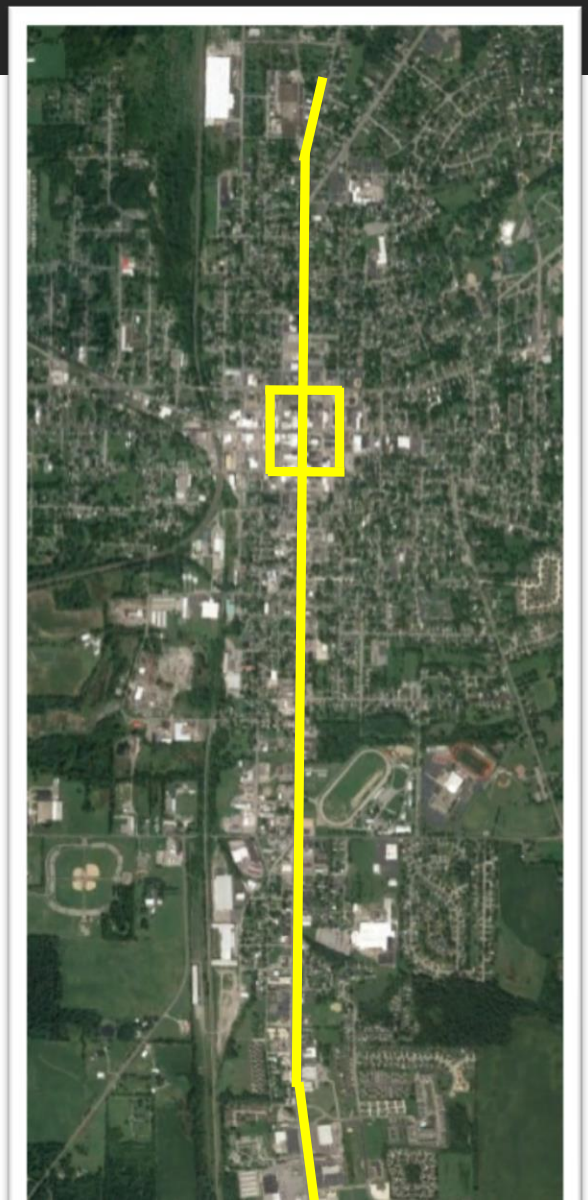
$16,546

Benefit Cost Ratio

90:1

DGL CONSULTING ENGINEERS

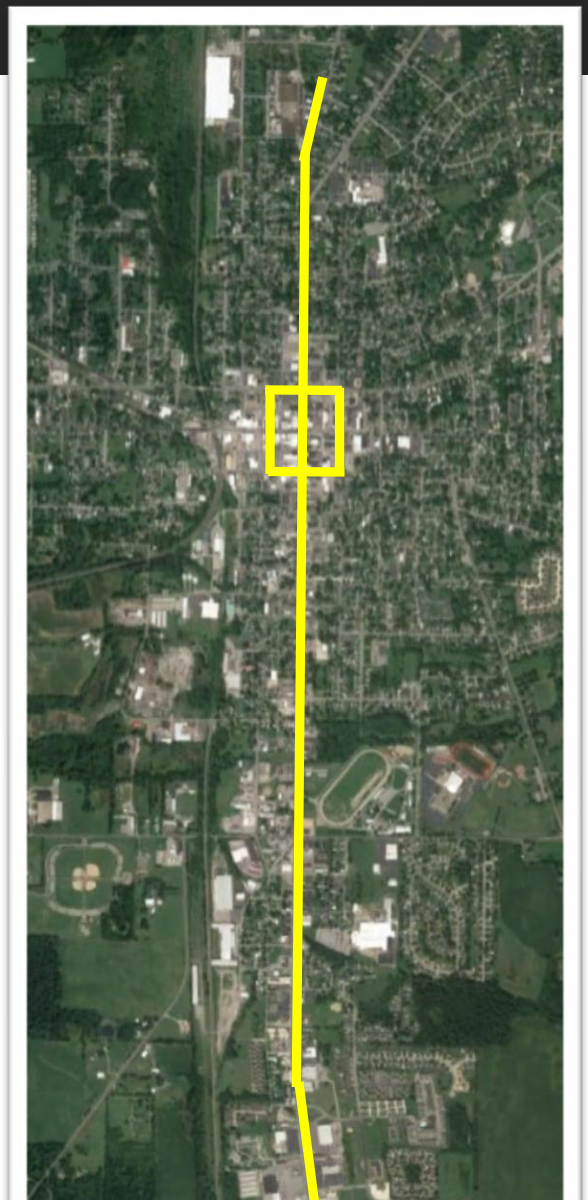
LOG-68



Stakeholders

- Office of Traffic Ops
- District 7
- City of Bellefontaine
- DGL

LOG-68

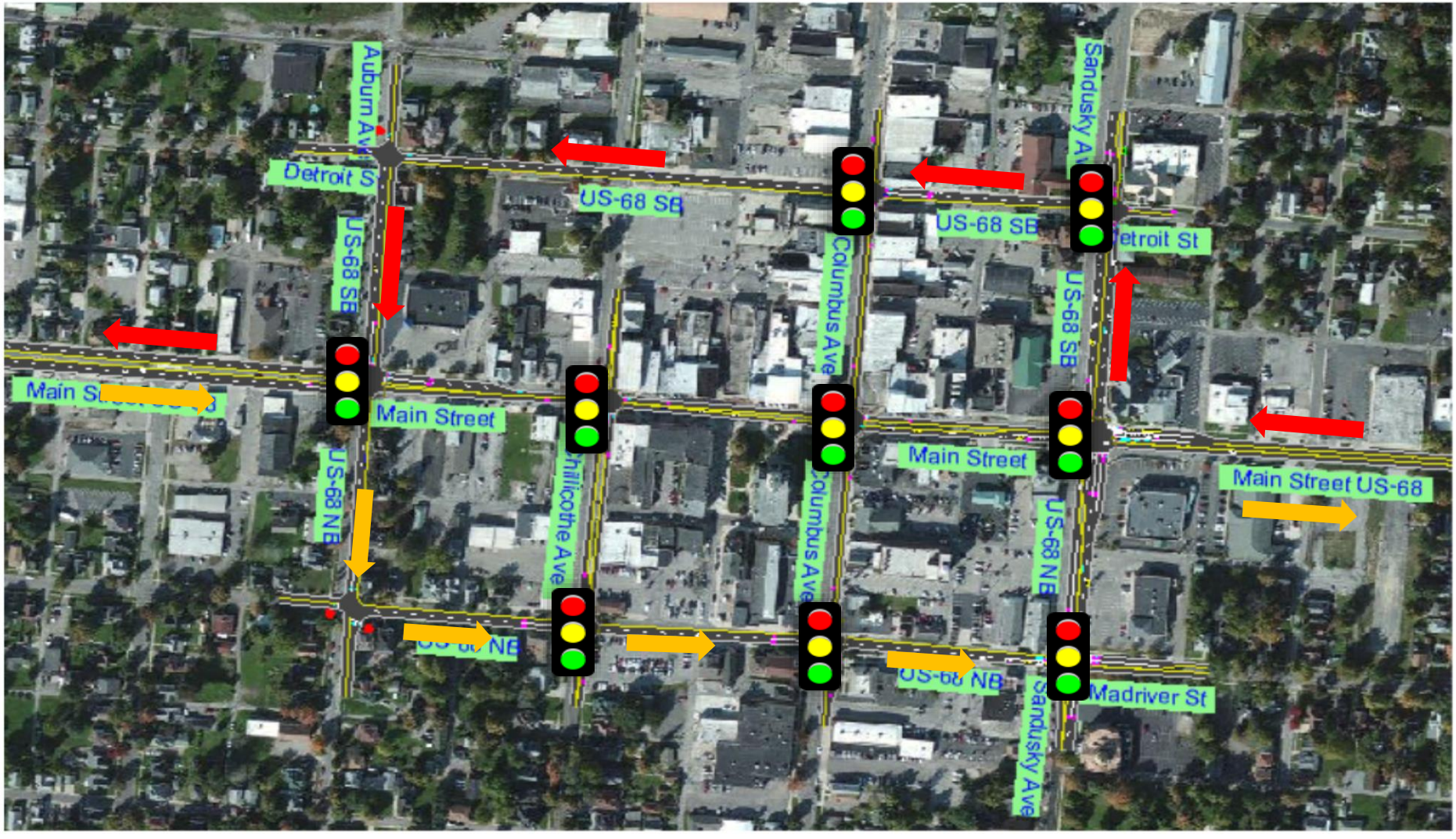


Intersections

1. US-68/Main St. & Rush Ave.
2. US-68/Main St. & Williams Ave.
3. US-68/Main St. & Sandusky Ave.
4. Main St. & Columbus Ave.
5. Main St. & Chillicothe Ave.
6. US-68/Main St. & Auburn Ave.
7. US-68/Main St. & Water Ave.
8. US-68/Main St. & Reynolds Ave.
9. US-68/Main St. & Washington Ave.
10. US-68/Main St. & Lake Ave.
11. US-68/Main St. & Clarkson Ave-Kent Dr.
12. US-68/Main St. & Augusta Ln.
13. US-68/Main St. & Allen Rd.
14. US-68/Main St. & Gunntown Rd.
15. US-68/Detroit St. & Sandusky Ave.
16. US-68/Detroit St. & Columbus Ave.
17. US-68/Madriver St. & Sandusky Ave.
18. US-68/Madriver St. & Columbus Ave.
19. US-68/Madriver St. & Chillicothe Ave.

DGL CONSULTING ENGINEERS

LOG-68 MAPS


Auburn Ave
Detroit St
US-68 SB
US-68 SB
Columbus Ave
Sandusky Ave
US-68 SB
Detroit St
US-68 SB
Main Street
Main Street
Main Street
Main Street US-68
US-68 NB
Chillicothe Ave
Columbus Ave
US-68 NB
US-68 NB
Madriver St
Sandusky Ave

LOG-68

Unique Corridor Features

- 19 intersections
- SR-68 splits in CBD
- One-Way pairs
- 90 degree turns
- 4 Analysis Periods
- Controller changeout
- 13,500 vpd

DGL
CONSULTING ENGINEERS

LOG-68 Traffic Operations

Intersection		*Main & Rush*	*Main & Williams*	*Main & Sandusky*	*Main & Columbus*	*Main & Chillicothe*	*Main & Auburn*	*Main & Water*	*Main & Washington*	*Main & Lake*	*Main & Clarkson-Kent*
AM	Pre-Study	A (5.5)	A (1.6)	C (24.1	A (7.6)	A (6.8)	A (5.3)	A (2.7)	A (3.4)	A (8.0)	A (4.1)
	Optimized	A (7.0)	A (1.2)	B (19.8	B (12.3)	A (7.0)	A (4.1)	A (2.6)	A (2.9)	A (8.8)	A (3.0)
	% Change	27%	-25%	-18%	62%	3%	-23%	-4%	-15%	10%	-27%
Off	Pre-Study	A (6.5)	A (2.4)	C (22.7	A (9.8)	A (8.6)	A (5.2)	A (3.5)	A (4.2)	A (8.1)	A (3.2)
	Optimized	A (9.4)	A (1.9)	B (18.2	B (12.5)	A (8.0)	A (5.8)	A (2.5)	A (5.1)	A (9.7)	A (3.6)
	% Change	45%	-21%	-20%	28%	-7%	12%	-29%	21%	20%	13%
Mid-day	Pre-Study	A (6.1)	A (2.5)	C (28.8	A (14.4)	B (10.7)	A (6.3)	A (4.5)	A (6.1)	A (8.0)	A (4.3)
	Optimized	B (10.1)	A (1.8)	C (20.0	B (16.0)	B (13.1)	A (6.3)	A (4.6)	A (5.3)	B (10.2)	A (4.1)
	% Change	66%	-28%	-31%	11%	22%	0%	2%	-13%	28%	-5%
PM	Pre-Study	A (9.1)	A (5.0)	D (40.8	B (14.0)	B (13.6)	A (6.4)	A (5.6)	A (6.0)	A (9.3)	A (4.4)
	Optimized	B (10.6)	A (3.1)	C (28.2	B (17.5)	B (16.4)	A (7.3)	A (5.4)	A (5.6)	B (13.2)	A (4.2)
	% Change	16%	-38%	-31%	25%	21%	14%	-4%	-7%	42%	-5%
Weekend	Pre-Study	A (5.1)	A (2.1)	C (26.5	B (11.8)	B (11.6)	A (5.6)	A (4.2)	A (5.4)	A (7.6)	A (5.2)
	Optimized	A (9.5)	A (2.1)	B (19.1	B (16.0)	B (12.4)	A (7.4)	A (5.2)	A (5.1)	B (11.8)	A (4.9)
	% Change	86%	0%	-28%	36%	7%	32%	24%	-6%	55%	-6%

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LOG-68 Traffic Operations

Intersection		*Main & Augusta*		*Main & Allen*		*Main & Gunntown*		*Detroit & Sandusky*		*Detroit & Columbus*		*Madriver & Sandusky*		*Madriver & Columbus*		*Madriver & Chillicothe*		*Main & Reynolds*	
AM	Pre-Study	A	(2.5)	A	(7.5)	A	(8.7)	A	(3.8)	A	(7.7)	B	(10.9)	A	(7.2)	A	(8.0)	A	(1.6)
	Optimized	A	(2.3)	A	(6.4)	A	(7.8)	A	(7.8)	B	(11.1)	B	(10.2)	A	(7.8)	B	(11.2)	A	(1.6)
	% Change	-8%		-15%		-10%		105%		44%		-6%		8%		40%		0%	
Off	Pre-Study	A	(4.1)	A	(8.0)	A	(9.7)	A	(4.5)	A	(8.3)	B	(16.0)	A	(8.1)	A	(9.0)	A	(4.0)
	Optimized	A	(2.8)	A	(9.4)	A	(8.8)	A	(6.5)	A	(9.0)	B	(13.9)	A	(9.0)	B	(12.3)	A	(5.3)
	% Change	-32%		18%		-9%		44%		8%		-13%		11%		37%		33%	
Mid-day	Pre-Study	A	(6.3)	A	(8.9)	B	(11.1)	A	(6.8)	A	(9.4)	D	(39.6)	A	(8.3)	A	(9.4)	A	(6.8)
	Optimized	A	(7.1)	A	(9.2)	B	(11.5)	A	(8.4)	B	(16.4)	B	(15.8)	A	(8.3)	B	(16.1)	A	(6.3)
	% Change	13%		3%		4%		24%		74%		-60%		0%		71%		-7%	
PM	Pre-Study	A	(5.1)	A	(9.3)	B	(12.2)	A	(8.2)	A	(9.5)	E	(62.6)	A	(9.4)	A	(9.9)	A	(6.6)
	Optimized	A	(4.7)	B	(11.4)	B	(12.8)	B	(10.5)	B	(19.5)	B	(17.0)	B	(15.9)	B	(13.9)	A	(5.2)
	% Change	-8%		23%		5%		28%		105%		-73%		69%		40%		-21%	
Weekend	Pre-Study	A	(7.1)	B	(11.1)	B	(14.5)	A	(4.6)	A	(8.8)	D	(38.3)	A	(8.1)	A	(8.9)	A	(1.7)
	Optimized	A	(5.8)	B	(10.0)	B	(11.5)	A	(8.4)	B	(15.6)	B	(15.8)	A	(8.1)	B	(12.8)	A	(5.8)
	% Change	-18%		-10%		-21%		83%		77%		-59%		0%		44%		241%	

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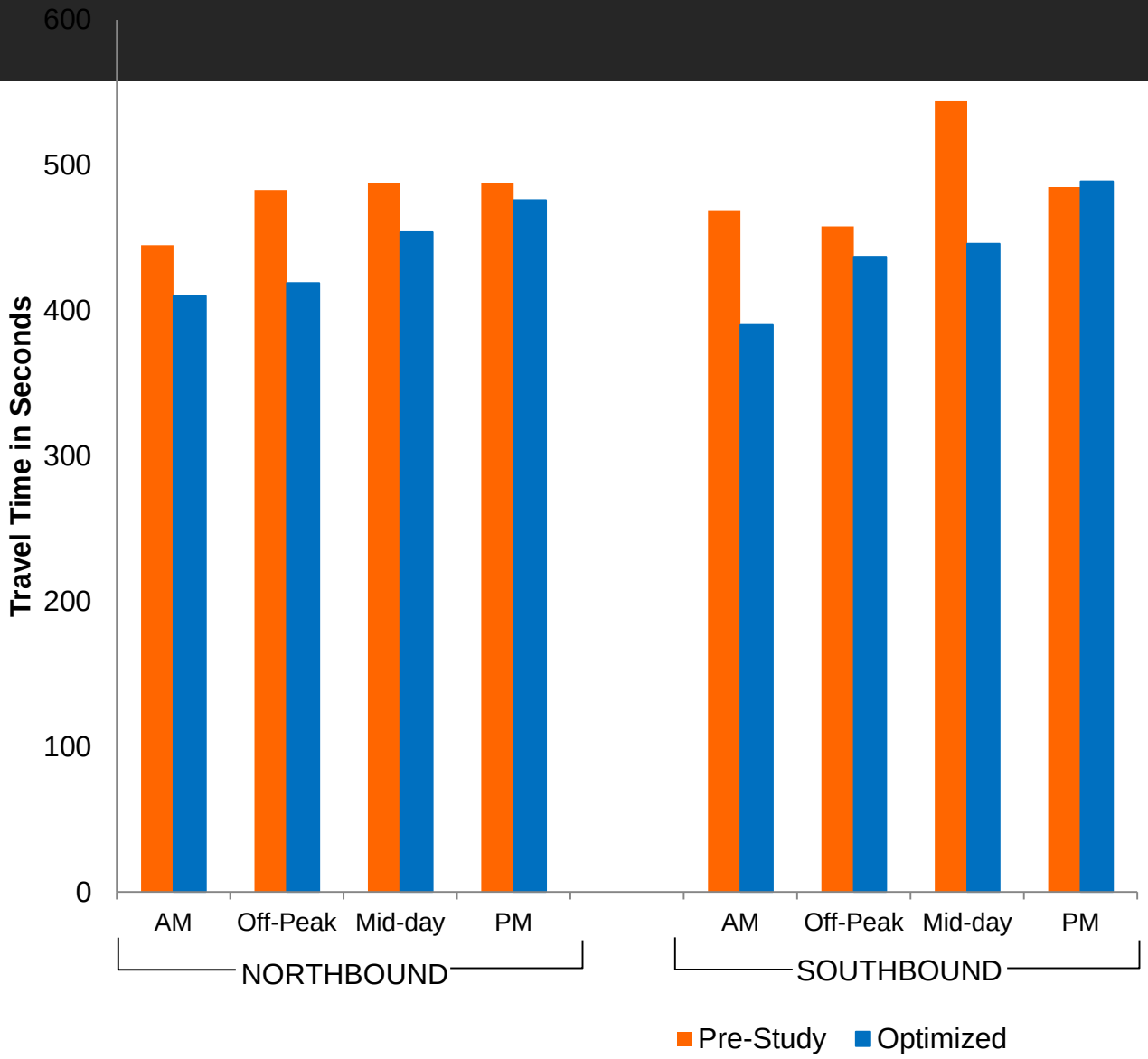
LOG-68 Travel Time



LOG-68
Travel Time

NORTHBOUND		
AM Peak	-35 secs	8% reduction
Off-Peak	-64 secs	13% reduction
Mid-day Peak	-34 secs	7% reduction
PM Peak	-12 secs	3% reduction
SOUTHBOUND		
AM Peak	-79 secs	17% reduction
Off-Peak	-21 secs	5% reduction
Mid-day Peak	-98 secs	18% reduction
PM Peak	4 secs	1% increase

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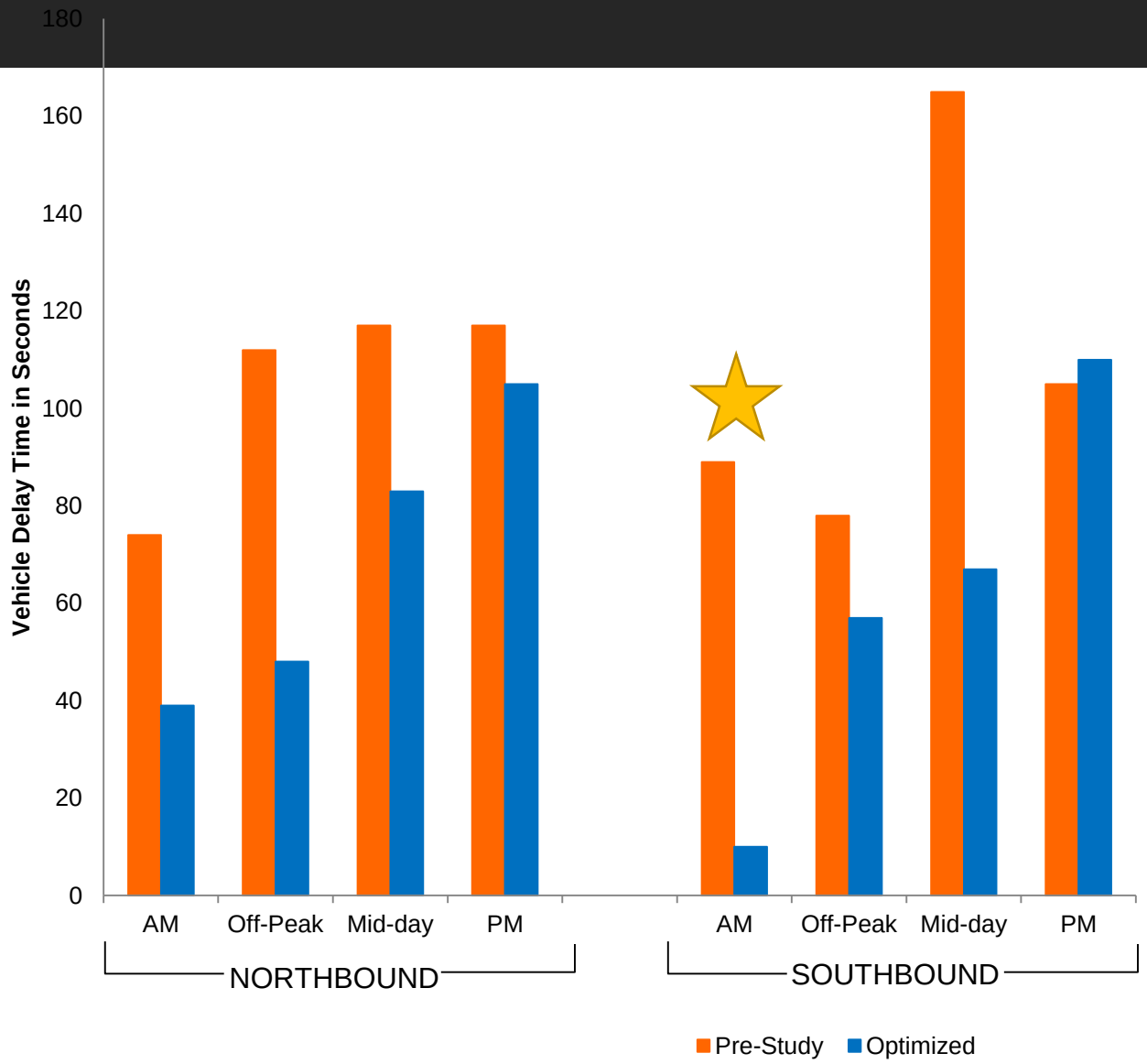
LOG-68 Vehicle Delay



LOG-68 Vehicle Delay

NORTHBOUND		
AM Peak	-35 secs	47% reduction
Off-Peak	-64 secs	57% reduction
Mid-day Peak	-34 secs	29% reduction
PM Peak	-12 secs	10% reduction
SOUTHBOUND		
AM Peak	-79 secs	88% reduction
Off-Peak	-21 secs	28% reduction
Mid-day Peak	-98 secs	60% reduction
PM Peak	5 secs	4% increase

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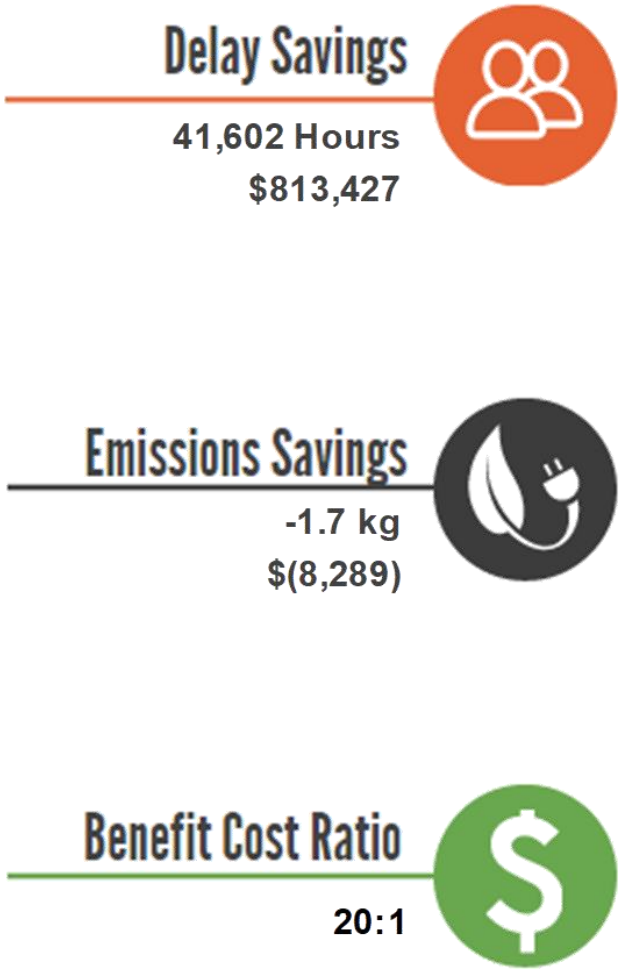
LOG-68 Estimated Signal Retiming Benefits



LOG-68 Additional Benefits

Controllers and GPS clocks replaced through STEP (Signal Timing Equipment Purchasing)

To be eligible Locals must have :

- Retimed the corridor through the Systematic Signal Timing and Phasing Program (Federal Safety Money)
- Sub-standard equipment
  - Controllers 10+ years old
  - Mixed manufacturer controllers
  - Poor communications
  - Time/sync issues

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LOG-68 Additional Benefits

Controllers and GPS clocks replaced through STEP (Signal Timing Equipment Purchasing)

- $66,475 to replace 18 controllers and GPS time clocks
- Installed through a Maintenance purchasing Contract
- City forces ensured that emergency pre-emption worked with the new controllers

ODOT

SIGNAL TIMING BENEFITS

Total Signals: 1,460
55% With Remote Comm.

Total Savings
$26 million

Signals Retimed: 190
Corridors Retimed: 21

Benefit Cost Ratio
40:1

ANNUAL SAVINGS

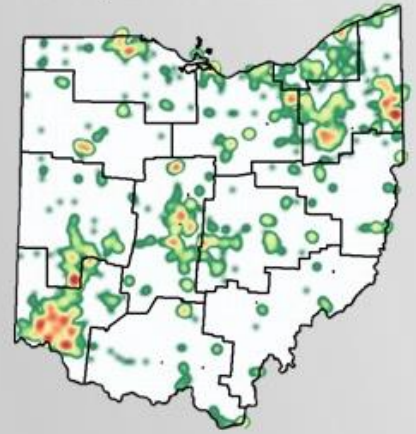
DELAY SAVINGS
985,000 hours
$21 million

FUEL SAVINGS
270,000 gallons
$520,000

CRASH REDUCTIONS
183 Crashes
$4.5 million

OTHER BENEFITS

COORDINATED SYSTEMS
696 signals in systems
125 systems statewide



REMOTELY MONITORING
810 Signals

2017

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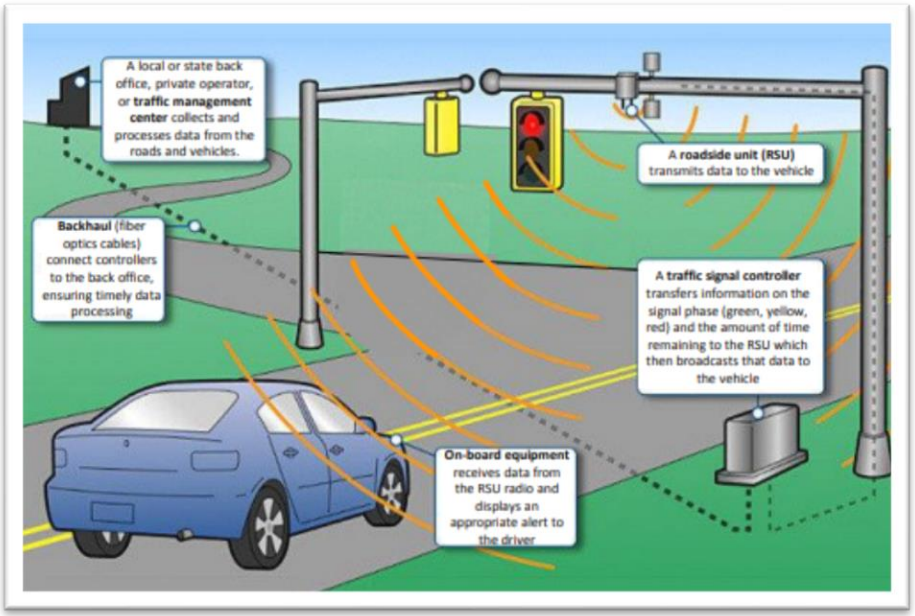
Coming Soon to a Corridor Near You

Lessons Learned



- Monitor corridor
- Inspect equipment
- Recount & retime every 3-5 years
- Plan for smart technologies with equipment upgrades

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