

Traffic Signal Overview

Brent Schlack, P.E.
Director of Engineering

Mark Fenelon
Signal Maintenance Supervisor

February 3, 2026

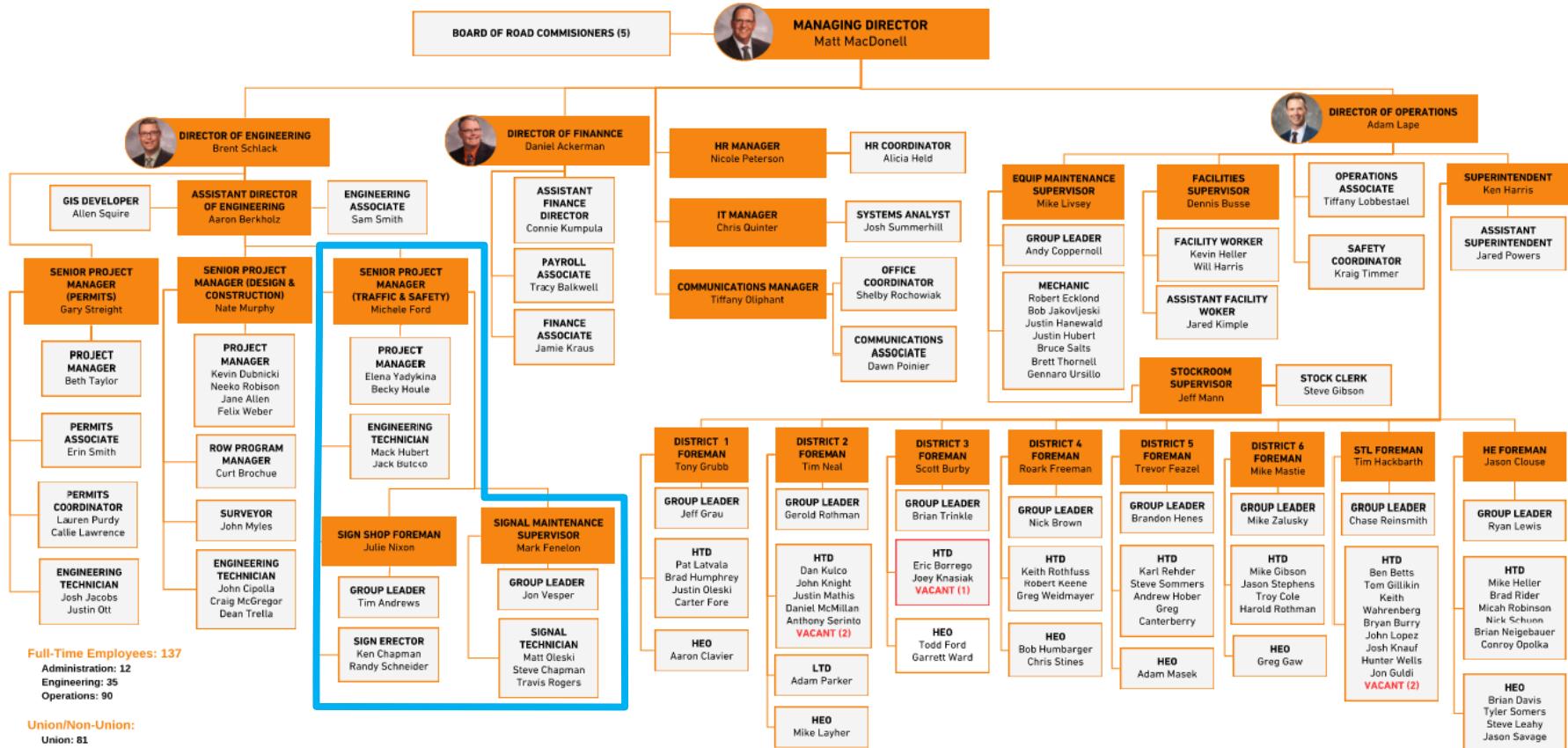


Agenda

- I. WCRC Signal Team
- II. Building a Network
- III. Communication
- IV. The Future

Washtenaw County Road Commission

Organizational Chart



Full-Time Employees: 137

Administration: 12
Engineering: 35
Operations: 90

Union/Non-Union:
Union: 81
Non-Union: 56

Vacancies: 5

Last Updated: January 5, 2026

Traffic Signal Team

**SENIOR PROJECT
MANAGER
(TRAFFIC & SAFETY)**
Michele Ford

**SIGNAL MAINTENANCE
SUPERVISOR**
Mark Fenelon

GROUP LEADER
Jon Vesper

**SIGNAL
TECHNICIAN**
Matt Oleski
Steve Chapman
Travis Rogers

- Senior Project Manager
- Signals
 - Signal Maintenance Supervisor
 - Group Leader
 - Signal Techs (3)
- Consultant Partners
- As-Needed Signal Services Contract

Core Responsibilities

Maintain traffic & pedestrian signals for safer travel!



System Maintenance

- Traffic signals
- Pedestrian signals
- Vehicle Detection
- Flashers
- CCTV
- Communication
 - 5G & 4G Cellular Modem
 - Wireless Interconnect
 - Fiber Optic
 - Ethernet Switch
- Battery Backup



WCRC Traffic Signals

- 201 Locations
 - 112 Traffic Signals
 - 60 with Battery Backup Units
 - 109 with Communication
 - 67 with Cameras
 - 55 Flashing Beacons
 - 34 RRFB's



Additional Maintenance Contracts

- MDOT Signals
 - 62 Traffic Signals
 - 10 Flashing Beacons
 - 3 Hawk Signals
- City of Milan
 - 6 Signals
 - 1 Flashing Beacon



Responding to the Public

- SeeClickFix for citizens to report issues
 - 675+ Signal-Related Requests in the Last 3 Years

Comments

All Public Only Internal Only

 **Washtenaw County Road Commission Neighbor** | Guest
Opened

At Ellsworth and Maple the traffic light that governs the left turn lane for the people driving south on maple is flipped around so the people driving north see it. Depending on the wind you can also see it when driving west on Ellsworth

05/24/2025 9:52 AM

 **Washtenaw County Road Commission** | Verified Official
Assignment

Washtenaw County Road Commission assigned this issue to T & S - Signal Supervisor - Mark

Flag • 05/24/2025 9:52 AM

 **T&S- Signal Supervisor- Mark** | Verified Official
Closed

Thank you for contacting the Washtenaw County Road Commission. The signal department has repaired the signal. Should you have any questions or concerns, please feel free to contact us at (734)761-1500.

Flag • 05/26/2025 3:23 PM

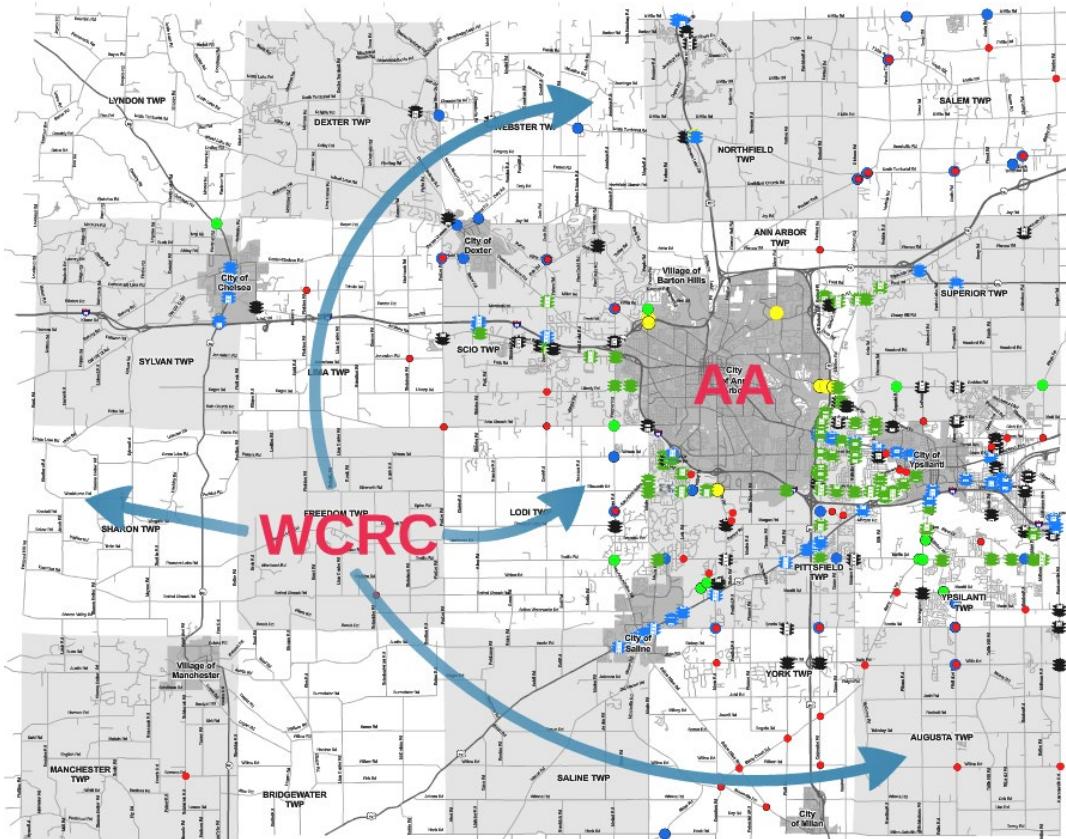
Equipment

- TS2 Type 1 and 2
- Econolite Controllers
- D4
- Detection
 - Wireless
 - Inductive Loops
 - Video
 - Radar



Communications

- Wireless Communications
- Licensed Radio System
- KITS – Advanced Traffic Management System



Early Signal Communication

2007

Jackson Rd and Zeeb Rd

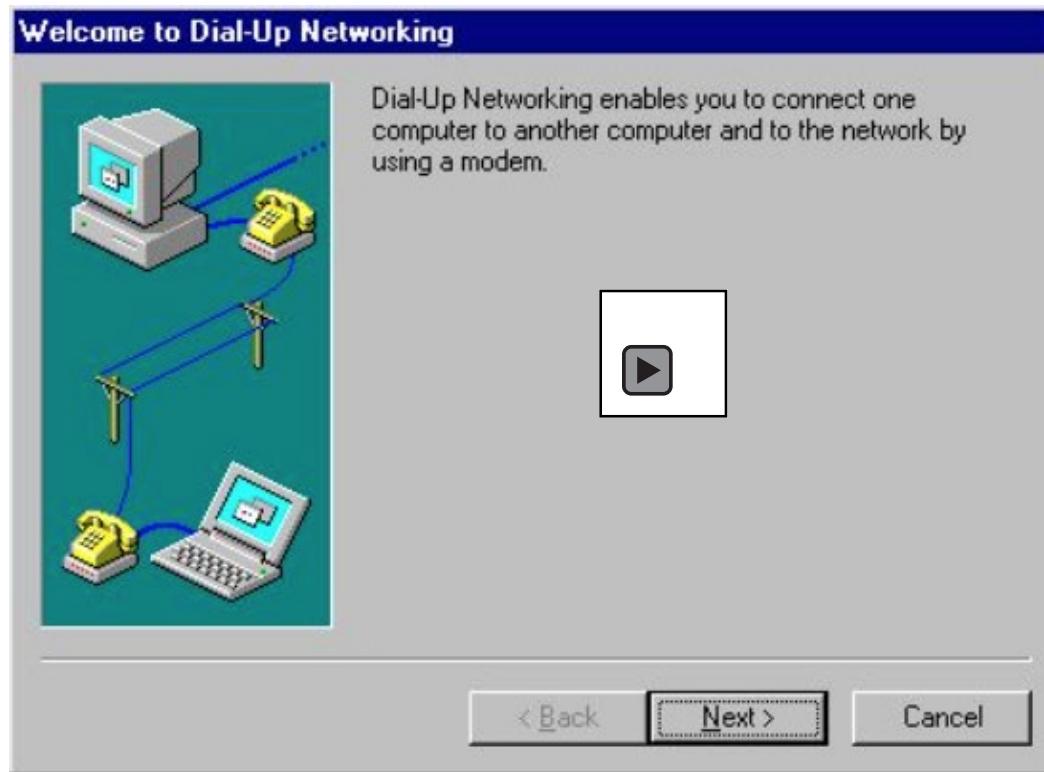


2011

Jackson Rd and Zeeb Rd



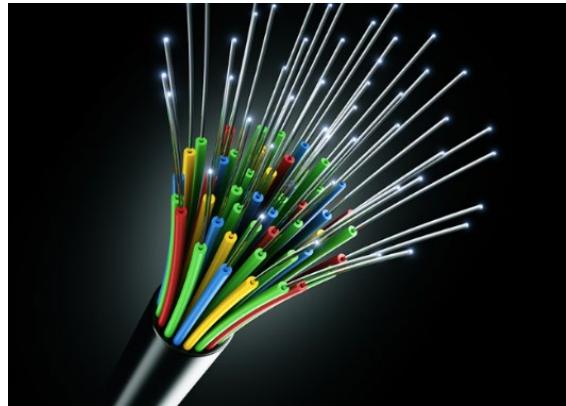
Early Signal Communication

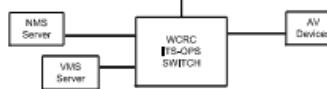
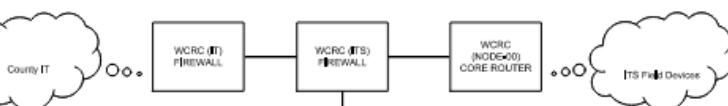
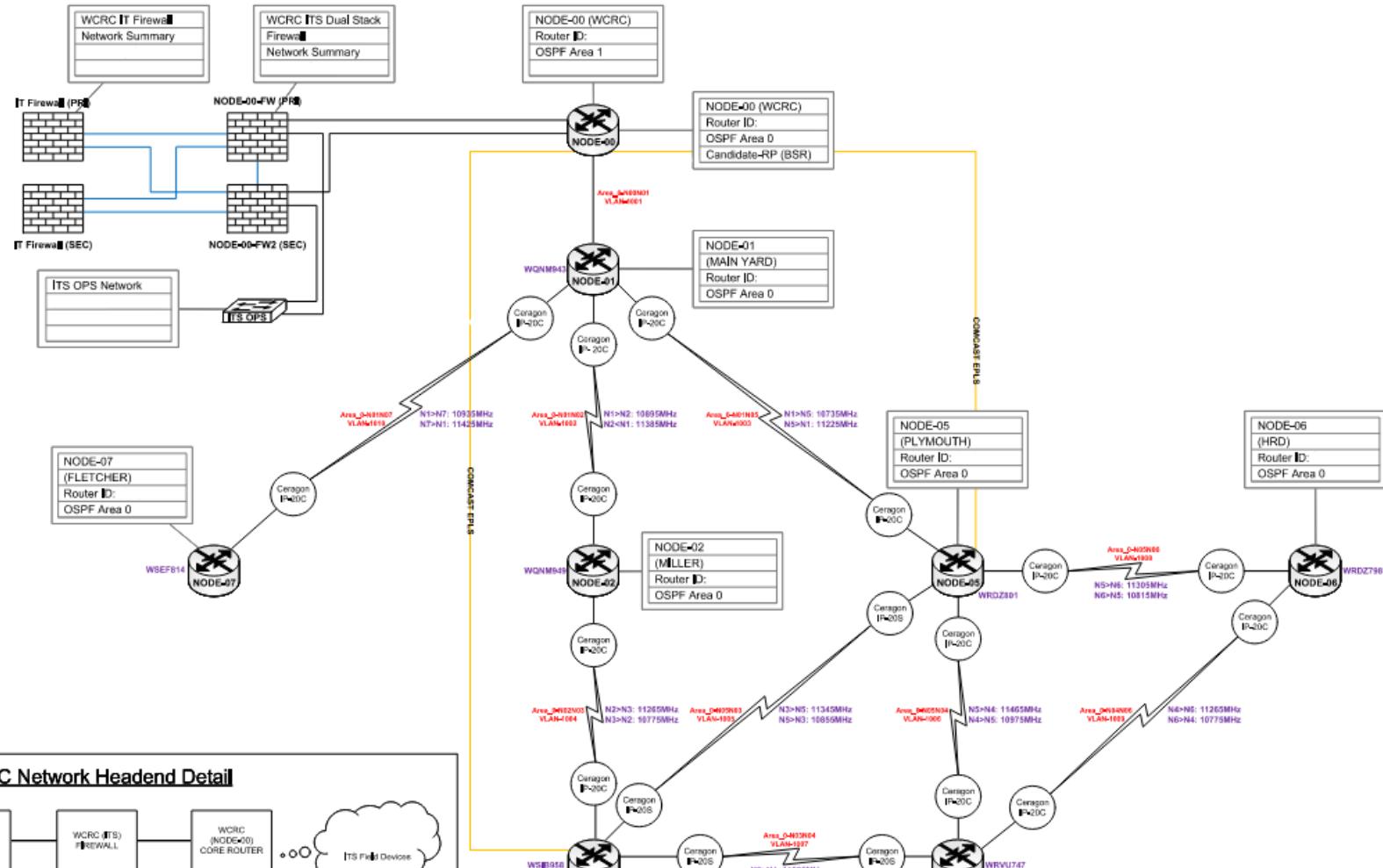


Creating a Network



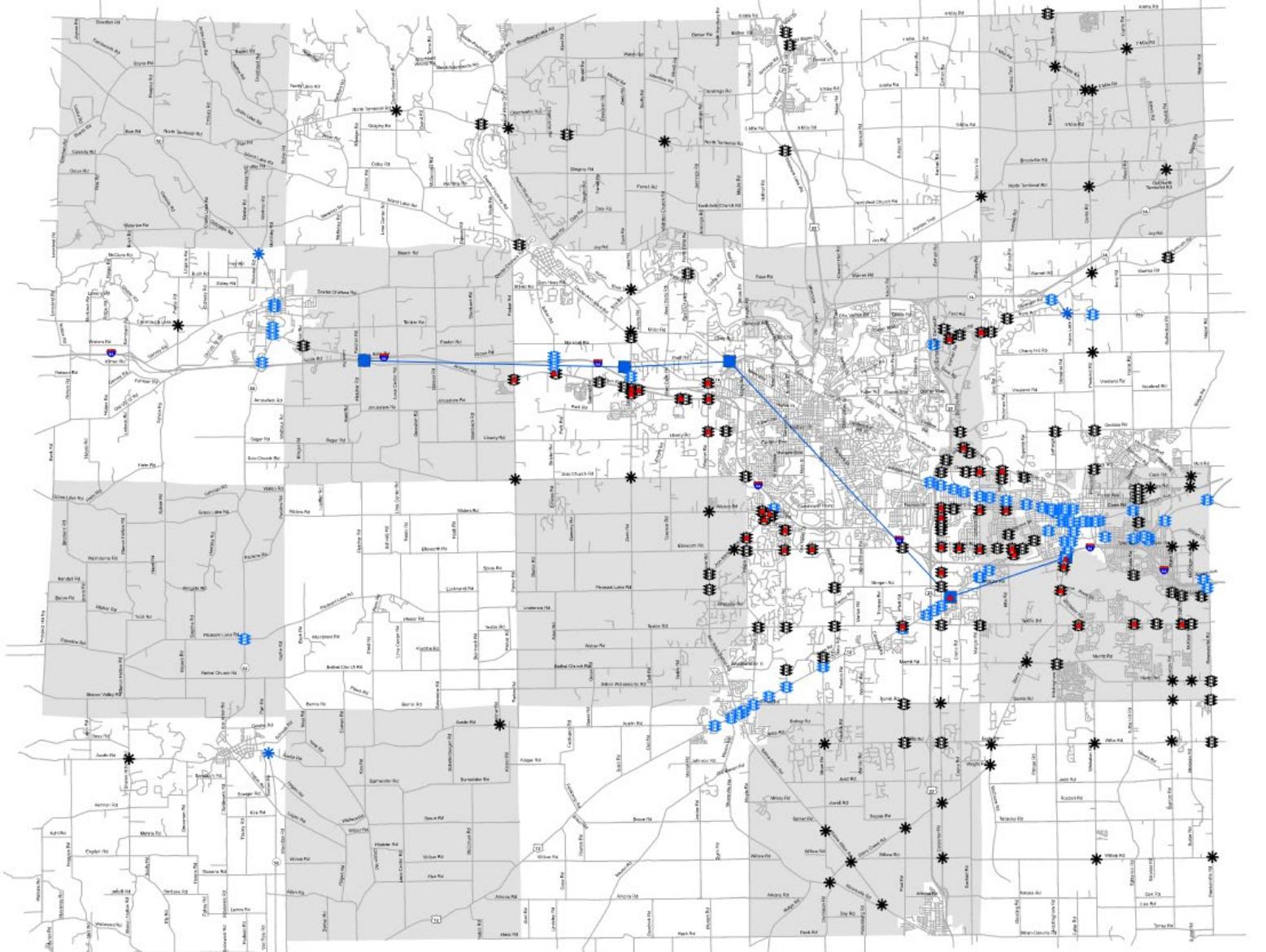
Strengthening the Network







Traffic Signal & Camera Map



▲ Traffic Cameras

■ MDOT Signals

■ WCRC Signals

＊ WCRC Flasher

＊ MDOT Flasher

■ Traffic Towers

— Traffic Tower Paths



0 1 2 Miles

Updated: December, 2023

Consultant Partner – Integral Blue

- Configures Wireless Interconnects, Cellular Modems and Ethernet Switches
 - 100+ Broadband Radios
 - 43 4G & 5G Cellular Modems
 - Manages Broadband Radio Licensing
 - Ethernet Switches
- Assigns IP Addresses
 - Controllers
 - MMU
 - CCTV
 - Wireless Vehicle Detection
 - Battery Back Ups
- Maintains Signal Quality
- Provides Field Support



Communication - SolarWinds

SOLARWINDS MY DASHBOARDS ALERTS & ACTIVITY REPORTS SETTINGS

WCR-CMSFENELONM HELP

Legend:

- Unknown
- Audible Pushbutton System (APS)
- Battery Backup System (BBS)
- Battery Sensor (BS)
- Cabinet Monitor (CM)
- Cellular Modem (CEMODEM)
- Closed Circuit Television System (CCTV)
- Closed Circuit Television System (CCTV)_360
- Closed Circuit Television System (CCTV)_PTZ
- Digital Video Encoder (DVE)
- Firewall (FW)
- Layer 2 Ethernet Switch (ESW)
- Layer 3 Router (RTR)
- Licensed Wireless Backhaul (LWB)
- Malfunction Management Unit (MMU)
- Network Attached Storage (NAS)
- Remote Processing Unit (RPU)
- Roadside Unit (RSU)
- Storage Area Network (SAN)
- Traffic Controller (TC)
- Uninterruptible Power Source (UPS)
- Video Management System (VMS)
- Virtual Machine (VM)
- Virtualization Host (VHOST)
- Wireless Detection System (WDS)
- Wireless Interconnect Master (WIM)
- Wireless Interconnect Remote (WIR)

All Alerts (25)

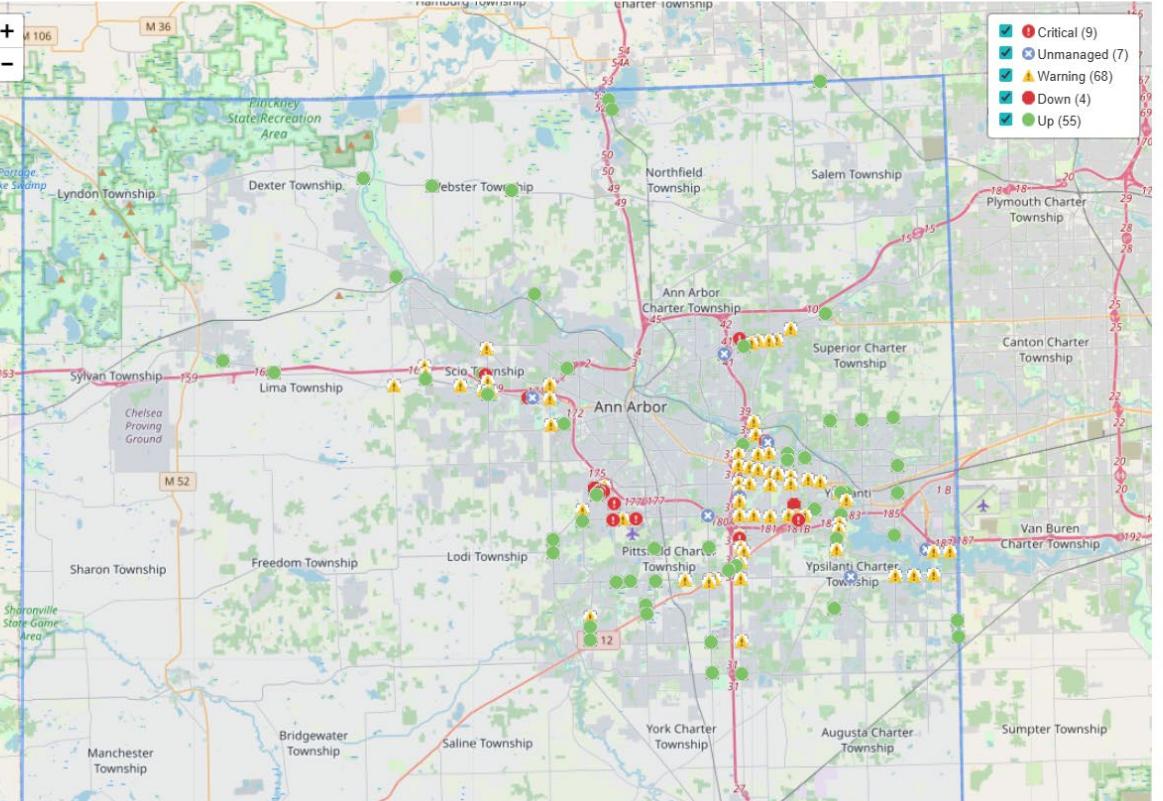
EDIT

Severity: 23

Search... 

Legend:

- Critical (9)
- Unmanaged (7)
- Warning (68)
- Down (4)
- Up (55)



The map displays the locations of various network devices across several townships in the Ann Arbor area. Key locations include Ann Arbor Charter Township, Superior Charter Township, Canton Charter Township, and Ypsilanti Charter Township. Numerous green dots (Up) are scattered across the map, while red dots (Down) and yellow triangles (Warning) are concentrated in the central and southern parts of the region. A legend in the top right corner provides a key for the alert status colors.

Consultant Partner – Kimley Horn

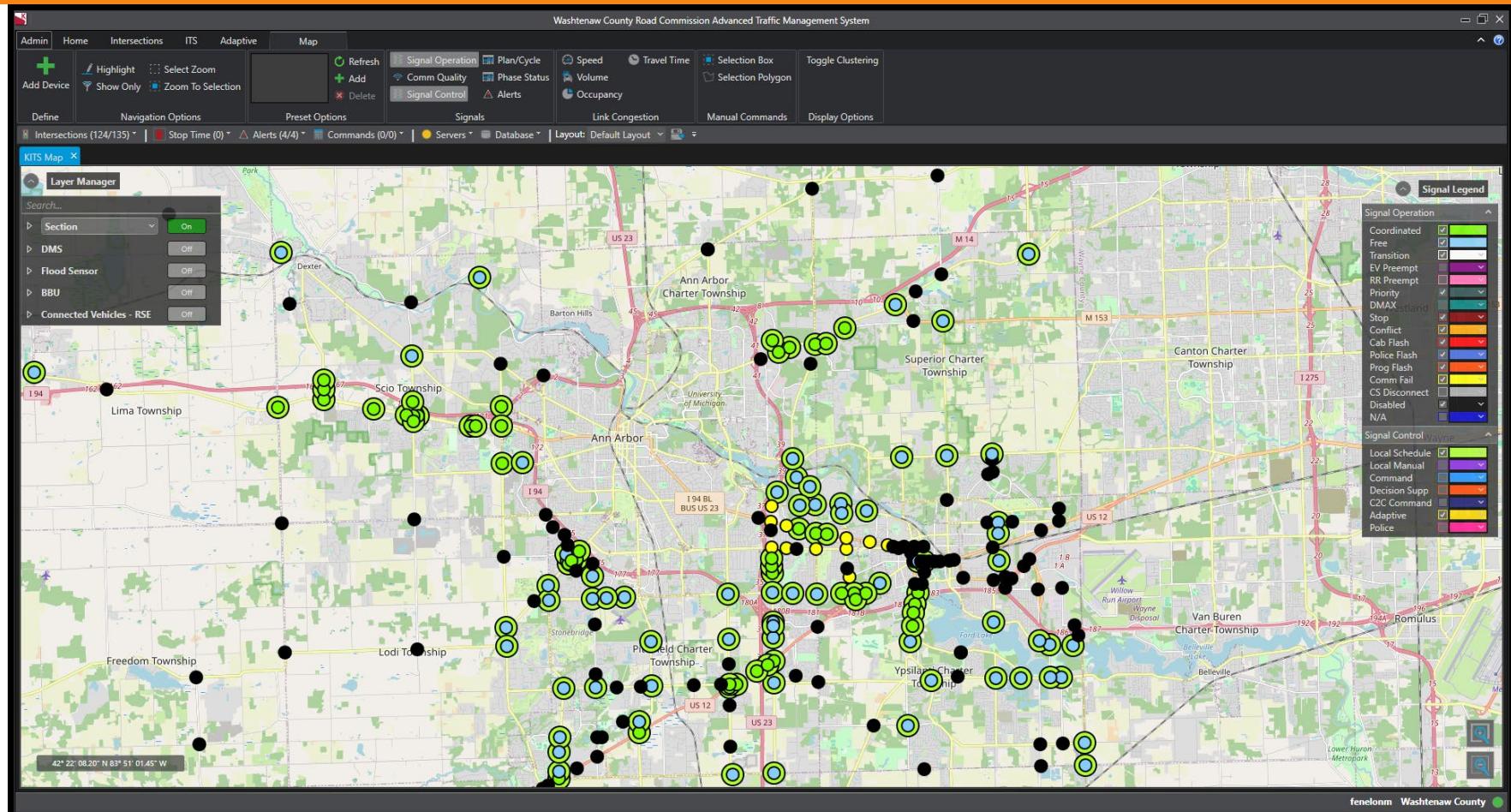
- KITS Traffic Management System
 - Allows for 24-hr intersection monitoring
 - Remote Timing Adjustments
 - Detection Monitoring
 - Real Time Data Capture
 - Alerts
- Traction(Workflow)
 - Work Orders

Kimley»Horn

Expect More. Experience Better.

Timing	Operation	Control	Plan	Cycle Offset		
	Free	Sched	Free	Database	0	
Master	Local	Time	Previous	73	0	
0	0	11:35:37	Current	24		
Ring 1		1-NBL	2-SBT	3	4-WBT	
Database	0	0	0	0		
Previous	0	73	0	15		
Current	0	9	0	0		
Veh. Phases						
Ped. Phases						
Veh. Calls						
Ped. Calls						
Ring 2		5-SBL	6-NBT	7	8-EBT	
Database	0	0	0	0		
Previous	0	73	0	15		
Current	0	9	0	0		
Veh. Phases						
Ped. Phases						
Veh. Calls						
Ped. Calls						
Overlaps						
Prev Green	0	0	0	0	0	
Curr Green	0	0	0	0	0	
Status						
Calls						
I	J	K	L	M	N	
Prev Green	0	0	0	0	0	0
Curr Green	0	0	0	0	0	0
Status						
Calls						

Communication - KITS



Communication - KITS

Washtenaw County Road Commission Advanced Traffic Management System

Admin Home Intersections ITS Adaptive Map

Highlight Select Zoom Refresh + Add - Delete

Signal Operation Plan/Cycle Comm Quality Phase Status Speed Travel Time Volume Alerts

Define Navigation Options Preset Options Signals Link Congestion Manual Commands Display Options

Intersections (124/135) | Stop Time (0) | Alerts (4/4) | Commands (0/0) | Servers | Database | Layout: Default Layout

KITS Map | Timing Values - 512023: TEXTILE@Lohr | Graphics | IO Status | Command | Batch Compare

Timing

Operation Control Plan Cycle/Offset

Free	Sched	Free	Database	0	0
Master	Local	Time	Previous	33	0
0	0	12:21:48	Current	15	

Ring 1 1-WBL 2-EBT 3 4-SBT

Database	0	0	0	0
Previous	14	33	0	0
Current	0	0	0	1

Veh. Phases

Ped. Phases

Veh. Calls

Ped. Calls

Ring 2 5-EBL 6-WBT 7 8-NBT

Database	0	0	0	0
Previous	14	33	0	0
Current	0	0	0	1

Veh. Phases

Ped. Phases

Veh. Calls

Ped. Calls

Overlaps A B C D E F G H

Prev Green	0	0	0	0	0	0	0	0
Curr Green	0	0	0	0	0	0	0	0
Status	●	●	●	●	●	●	●	●
Calls	●	●	●	●	●	●	●	●

I	J	K	L	M	N	O	P
0	0	0	0	0	0	0	0

Prev Green 0 0 0 0 0 0 0 0

Curr Green 0 0 0 0 0 0 0 0

Status ● ● ● ● ● ● ● ●

Calls ● ● ● ● ● ● ● ●

Priority 1 2 3 4 5 6 7 8

Pending Early Extend Resv Inh Defer Next

fenelomn Washtenaw County

Real Time Timing Values

Washtenaw County Road Commission Advanced Traffic Management System

Admin Home Intersections ITS Adaptive Map

Real-Time Monitoring Alerts/Events Graphics/Reports

Intersections (135/135) Stop Time (0) Alerts (4/4) Commands (0/0) Servers Database Layout: Default Layout

KITS Map Timing Values - 512008: Ann Arbor-Saline@Waters/Lohr

Timing

Operation Control Plan Cycle Offset

Coord	Sched	12	Database	120	114
Master	Local	Time	Previous	0	0
16	97	13:38:16	Current	24	

Ring 1 1-SBL 2-NBT 4-EBT 8-WBT

Database	30	40	25	25
Previous	0	0	0	0
Current	7	0	0	0

Veh. Phases

Ped. Phases

Veh. Calls

Ped. Calls

Ring 2 6-SBT 5-NBL

Database	43	17
Previous	0	0
Current	7	0

Veh. Phases

Ped. Phases

Veh. Calls

Ped. Calls

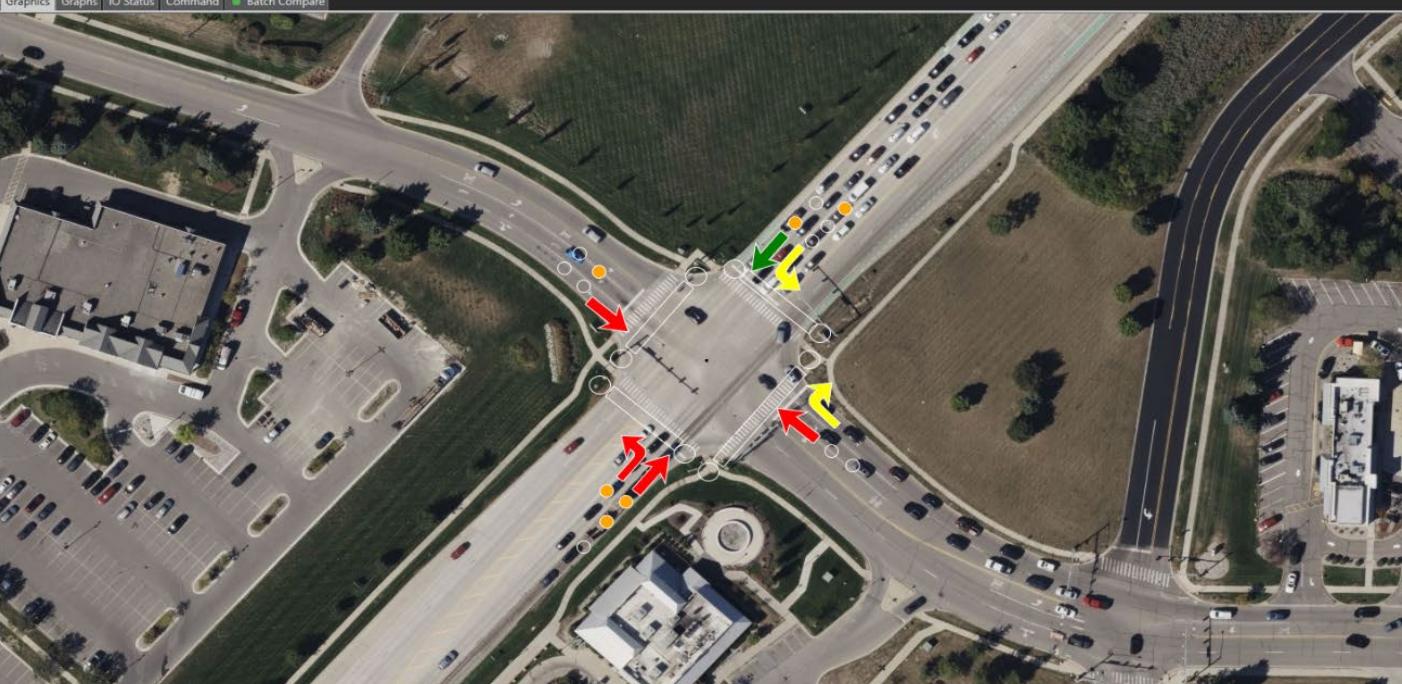
Overlaps

A	B	C	D	E	F	G	H
Prev Green	0	0	0	0	0	0	0
Curr Green	5	0	0	0	0	0	0
Status Calls	●	●	●	●	●	●	●
I	J	K	L	M	N	O	P
Prev Green	0	0	0	0	0	0	0
Curr Green	0	0	0	0	0	0	0
Status Calls	●	●	●	●	●	●	●

Priority

1	2	3	4	5	6	7	8
Pending	●	●	●	●	●	●	●
Early	●	●	●	●	●	●	●
Extend	●	●	●	●	●	●	●
Resv Inh	●	●	●	●	●	●	●
Defr Next	●	●	●	●	●	●	●

Editor



fenlonm Washtenaw County

Update Available!

KITS Alert Log

Email Alert Configuration for fenelonm

Saved Configurations:	
 Notifications	
 upsconflict	

User Email:

Area/Zone	Event
All Signals	Stop Time Start
All Signals	Stop Time End
All Signals	Conflict Start
All Signals	Conflict End
All Signals	Manual Start
All Signals	Manual End
All Signals	BBU: Battery Power Start
All Signals	BBU: Battery Power End
 	

 Add  Delete

 Add  Delete

  Copy configuration to

Exit  Save 

KITS Alert Log

508026: LIBERTY@SCIO RIDGE: Stop Time Start at 06:37:58:230

 Summarize



Signals



Reply

Reply All

Forward



...

To  7348451897@vtext.com;  Fenelon, Mark;  Ford, Michele;  Berkholz, Aaron;  Vesper, Jon

Sat 01/24/2026 6:38 AM

508026: LIBERTY@SCIO RIDGE: Stop Time Start at 06:37:58:230

KITS HIT Report

Washtenaw County Road Commission Advanced Traffic Management System

Admin Home Intersections ITS Adaptive Map HIT

Zoom In Zoom Out Zoom To Day Zoom To Week Zoom To Month Go To Date Day Forward 01:00 From Current Time Day Backward Period Forward No Period Backward Reload Data

Time Options

Intersections (116/135) Stop Time (0) Alerts (24/24) Commands (0/0) Database Layout Default Layout

KITS Map Event Log HIT Report - 508004: JACKSON@ZEEB

Tuesday, January 13, 2026 01/13/2026 11:13 AM - 01/13/2026 12:13 PM

Historical Intersection Timing Graph 1 - 2 3 - 4

Ring 1 Time Series of Phase Duration

Cumulative Split Tim

Plan 2

11:15 11:18 11:21 11:25 11:28 11:31 11:35 11:38 11:41 11:45 11:48 11:51 11:55 11:58 12:01 12:05 12:06 12:08

Time

Transition Comm Fail 4-NBT 2-WBT

Ring 2 Time Series of Phase Duration

Cumulative Split Tim

Plan 2

11:15 11:18 11:21 11:25 11:28 11:31 11:35 11:38 11:41 11:45 11:48 11:51 11:55 11:58 12:01 12:05 12:06 12:08

Time

Transition Comm Fail 8-SBT 6-EBT

Notable Signal Events

75.0% 12.5% 12.5%

Comm Fail Detector Fault Transition

Signal Details

Split Monitor Split Details Events Comms

Legend Gap Max Force-Off FO Violation

Date	Plan	Cycle	Offset	P1	P2	P3	P4	P5	P6	P7	P8	Veh Call	Ped Call
01/13/2026 12:10:09 PM	2	99	6	0	46	0	37	0	46	0	37	-2-4-6-8	-----
01/13/2026 12:08:28 PM	2	99	7	0	49	0	45	0	49	0	45	-2-4-6-8	-----
01/13/2026 12:06:53 PM	2	100	6	0	39	0	45	0	39	0	45	-2-4-6-8	-----
01/13/2026 12:05:07 PM	2	94	11	0	52	0	38	0	52	0	38	-2-4-6-8	-----
01/13/2026 12:03:29 PM	2	99	6	0	51	0	44	0	51	0	44	-2-4-6-8	-----
01/13/2026 12:01:48 PM	2	99	7	0	54	0	42	0	54	0	42	-2-4-6-8	-----
01/13/2026 12:00:09 PM	2	100	6	0	51	0	45	0	51	0	45	-2-4-6-8	-----
01/13/2026 11:58:29 AM	2	98	7	0	54	0	44	0	54	0	44	-2-4-6-8	-----
01/13/2026 11:56:49 AM	2	98	7	0	51	0	38	0	51	0	38	-2-4-6-8	-----

Total: 34 Items Per Page Page 1 of 1

Phase Termination Statistics

Termination Histograms Phase Timing Histograms

Phase 2-WBT Phase 4-NBT Phase 6-EBT Phase 8-SBT

Frequency

Force Off Termination

Force Off Termination

Force Off Termination

Force Off Termination

fenlon@Washtenaw County

Additional Partner – Carrier & Gable

- Supplier
- Field Support
- Training



Security is key

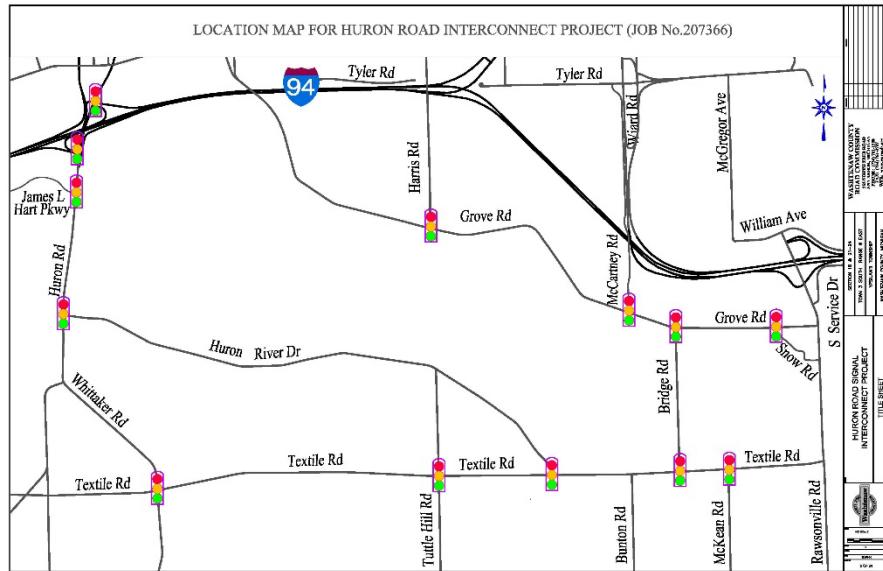
A stable system is a secure system

- Network Security
 - Switches
 - Firewalls
- Infrastructure Security
 - Network
 - Equipment



The Future – Grants

- Congestion Mitigation & Air Quality (CMAQ)
- Carbon Reduction
- Safety



In the past 8 years, the T&S team has brought more than **\$28 million** in grant projects to Washtenaw County

The Future – Continuing to Build

- More modems!
- More weather stations
- Preemption for emergency vehicles
- Connected vehicles?
- Better detection





QUESTIONS?



