



Data-Infused Workflow for TMCs

ITS Texas – September 2022

Lance Ballard, P.E.



PREPARED BY

Kimley»Horn



Outline

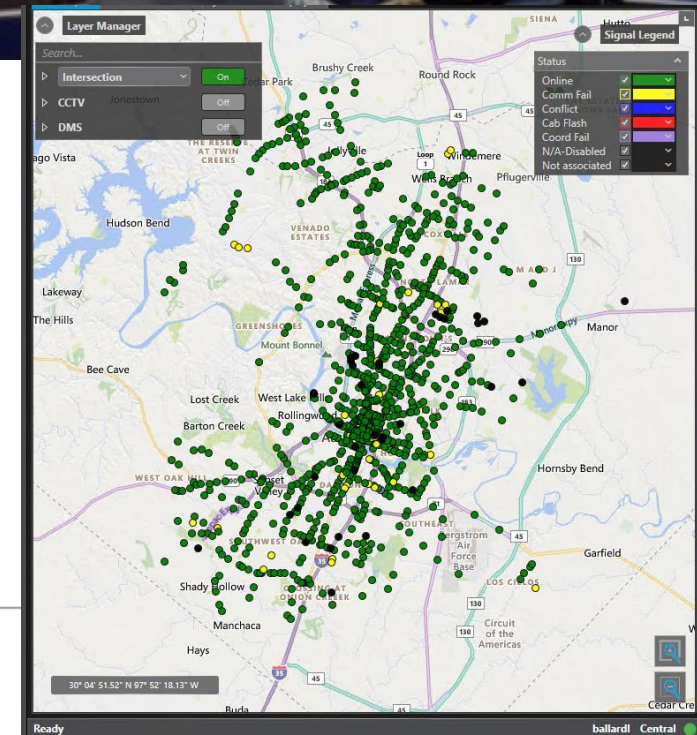
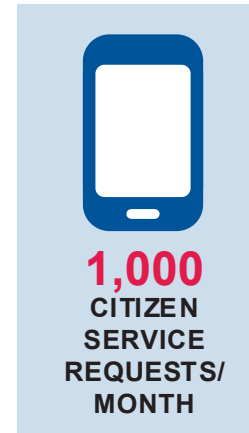
- Mobility Management Center (MMC) Overview
- Cast Vision
- Infuse Data into Workflow
- Turn Data into Action
- Capture Benefits





Mobility Management Center - Overview

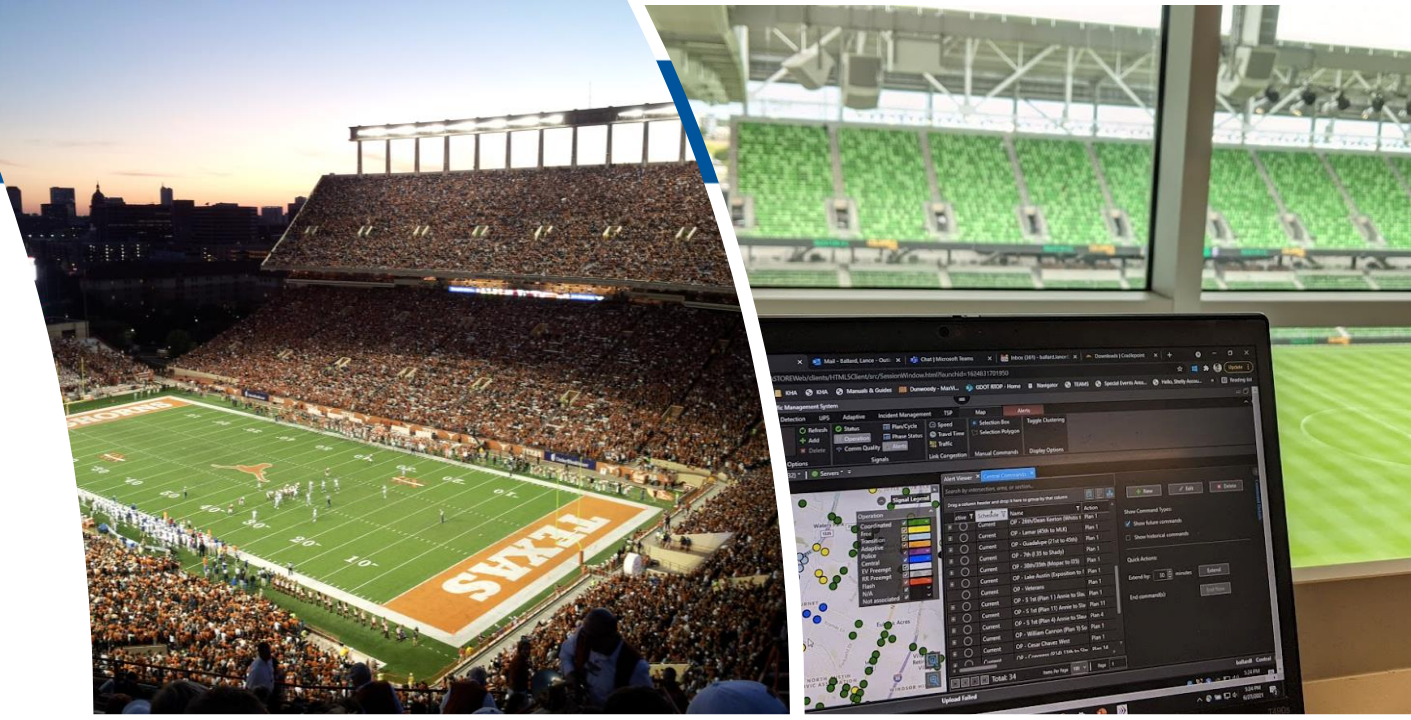
- Active management
- Maintenance management
- Dispatch technicians
- Event management
- Emergency response support
- Traveler information





Special Events

- **Adjust timings** >300 events/yr
- Major Events
 - SXSW
 - Austin City Limits
 - UT Football
 - Austin FC
 - Formula 1 US Grand Prix
- Expanding to incorporate more minor events





MMC 5-Year Vision

- Goal

Continued improvement of arterial ops...
...for all modes

- Objectives

1. "One System" Mentality
2. Comprehensive Situational Awareness
3. ***Transform Data into Action***
4. Data Hub



Austin Mobility Management Center Five-Year Vision

GOAL

Continued improvement of arterial operations by providing comprehensive management of the City's arterial network for all modes of travel.

OBJECTIVES

1. "One System" Mentality for Management and Operations

- The MMC will serve as a **"one stop shop"** to coordinate, monitor, and dispatch activities for AMD and ATD as a whole.
- The MMC will integrate software and management systems across ATD to streamline monitoring and tracking.
- The MMC will **increase presence at the CTECC** and will coordinate ATD responsibilities to and with regional partners, serving as the primary point of contact for ATD and partner agencies for operations.
- Over the next five years, the MMC will integrate systems and software to facilitate the sharing of information with TxDOT, CTRMA, CapMetro, and other partners.
- The MMC will **routinely identify and pro-actively implement countermeasures** to arterial operations during the construction of **major construction projects/programs** like 2016 Mobility Bond projects, Project Connect, IH 35, US 183A, and others.

2. Comprehensive Situational Awareness

- The MMC will build, implement, and **use systems to capture traffic incidents and micro-events** within the City's roadway network.
- The MMC will monitor and track health status for all field devices by **integrating all smart devices** on the City's ITS network into the MMC's Advanced Traffic Management System (ATMS) and/or other **situational awareness tools**.
- The MMC will **use data and situational tools to create automated triggers** to alert the MMC and its partners to changing conditions or other disruptive events. Triggers may also be used to automatically execute certain controlled actions to respond to these conditions.
- The MMC will track and analyze **system performance measures** to find issues within the system and address them pro-actively.
- The MMC will proactively identify and appropriately plan (mitigate) for all road closures.



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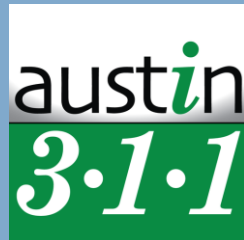


Available Data



Data Tracker

Austin Transportation Department



**Asset Management
& Service Requests**



Incidents

**Third-Party
Travel Data**



A Kimley-Horn Software Solution



**Signal &
ITS System**



A Kimley-Horn Software Solution





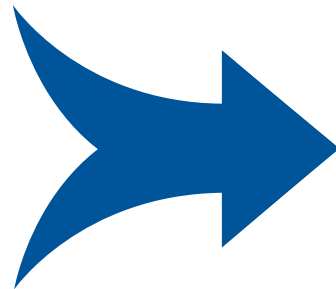
Data Infused Work Plan



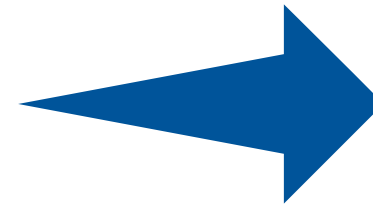
Available Data



MMC Tasks



Dashboards and
Data Tools



+ %

Signal
Operational
Improvements



Data Infused Work Plan



Data Infused Work Plan

DAILY

IDENTIFY NEW ISSUES

INRIX Signal Analytics

ACT ON ISSUES AND DOCUMENT THEM

COORDINATE AND MANAGE SCHEDULED ACTIVITIES

SHIFT SUMMARIES

*Improve coordination/
hand-off and tracking
outstanding tasks*



Data Infused Work Plan

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*Improve coordination/
hand-off and tracking
outstanding tasks*

WEEKLY

IDENTIFY TRENDS

*Top 'X' lists of various
issues types*

Changes in KPIs

PREPARE FOR WEEK AHEAD

Upcoming Events

Scheduled Work

*Major MMC Tasks
(backlog, etc)*



Data Infused Work Plan

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MONTHLY

LOOK BACK

Identify larger trends

*Identify and address
any lingering issues*

Analyze SRs, WOs

*Aggregate Metrics for
AMD*

Share Lessons

*Learned in Monthly
Training*

LOOK FORWARD

Upcoming Events

Major Tasks

Workload needs



Data Infused Work Plan

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IDENTIFY NEW ISSUES

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LOOK FORWARD

Upcoming Events

Major Tasks

Workload needs

NON-REGULAR

SEASONAL

*Prepare for Daylight
Savings, School
Calendars*

EVENTS

*Integrate tasks into
Data Tracker*

Event Calendar

Pre-Planning

Debrief

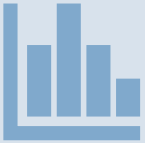
Closeout

WEATHER EVENTS

*Analyze locations with
most frequent issues
during storms*



New Tools



Data Visualization



Power BI



Third-Party Data Providers



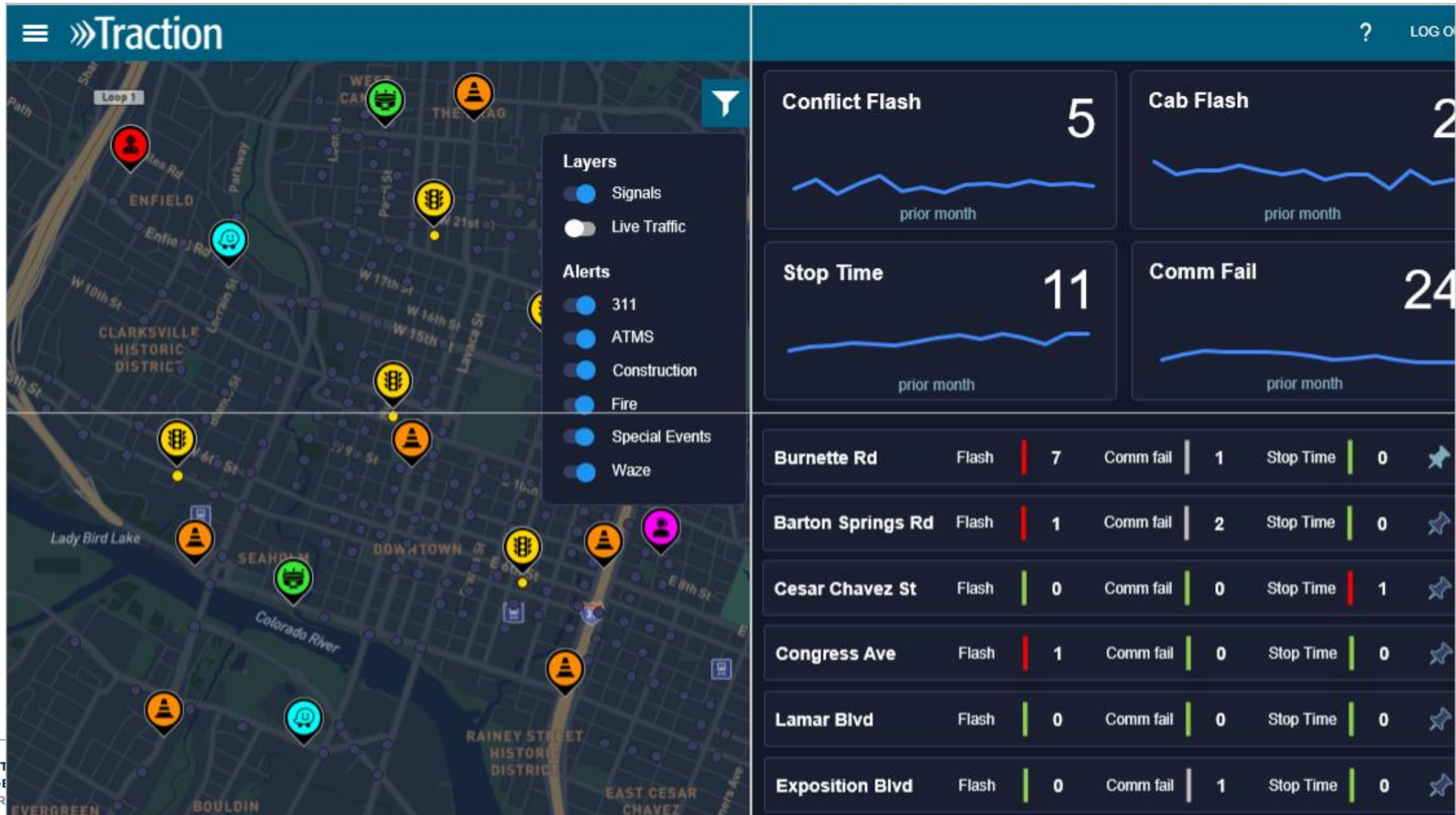
ATMS Integration



A Kimley-Horn Software Solution

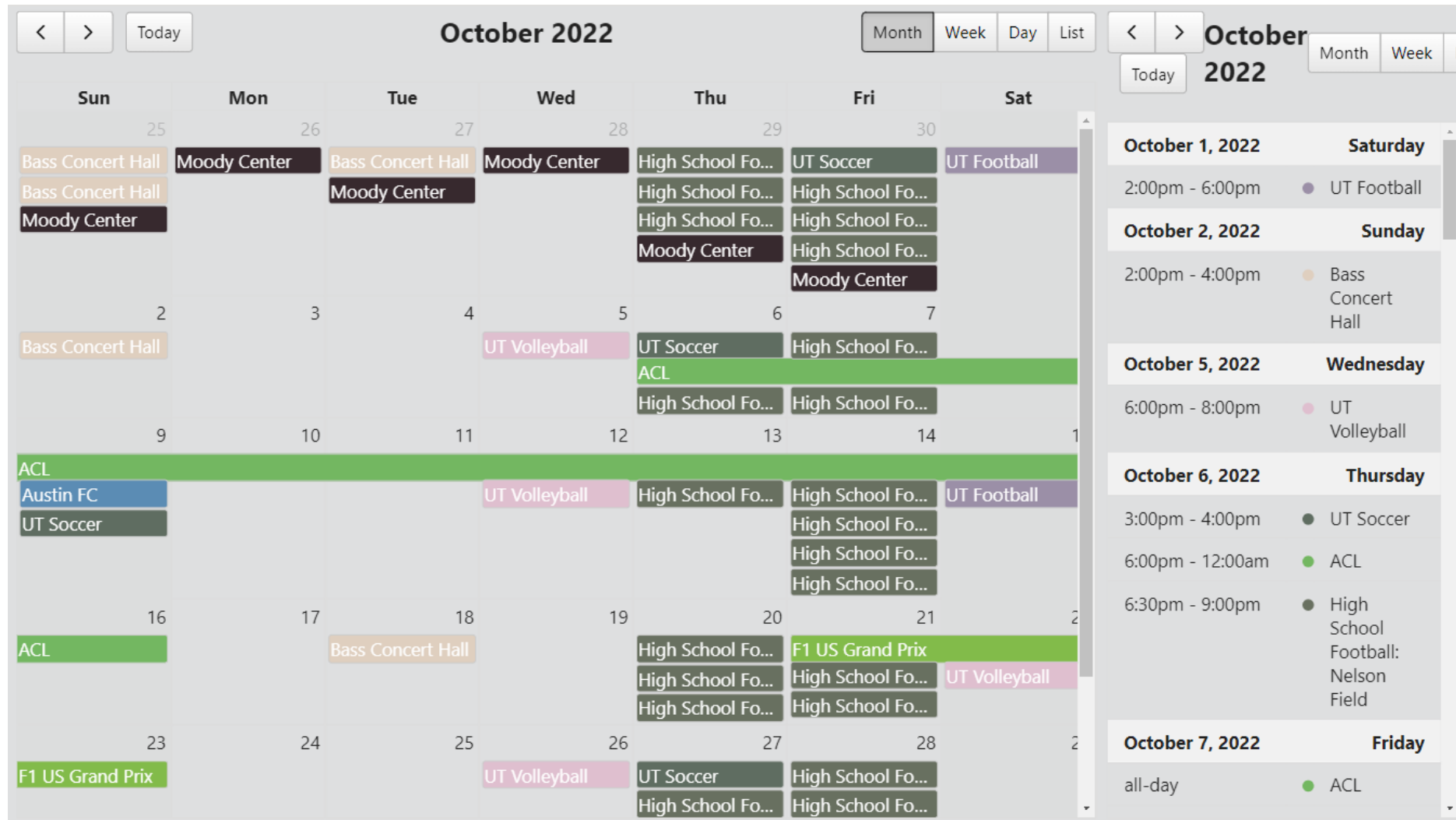


Coming Soon – Situational Awareness Integration





New Tools – MMC Calendar





New Tools – Identify ITS Device Issues

AMD Device Comm Status



AUSTIN
TRANSPORTATION



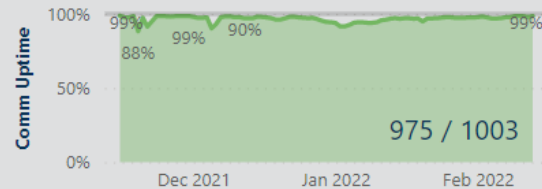
MOBILITY
MANAGEMENT
CENTER

Kimley»Horn

2/14/2022 4:35:31 PM

Date Last Refreshed

Signals



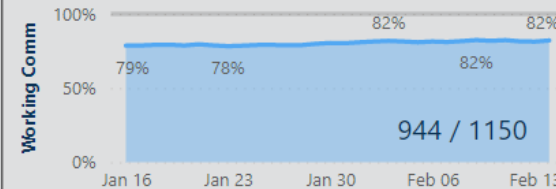
Yesterday

99% ▲

7-Day Running Average

98%

Detectors (IP Only)



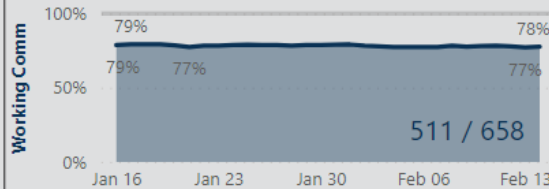
Today

82% ▲

7-Day Running Average

82%

CCTV



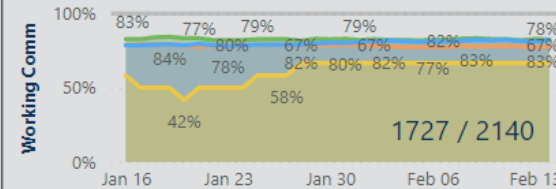
Today

78% ▲

7-Day Running Average

78%

MMU - INCOMPLETE



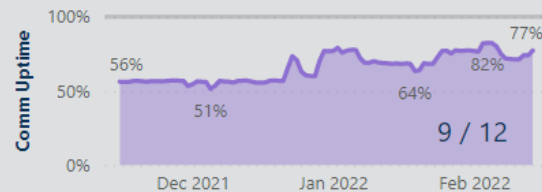
Today

81% ▲

7-Day Running Average

81%

DMS



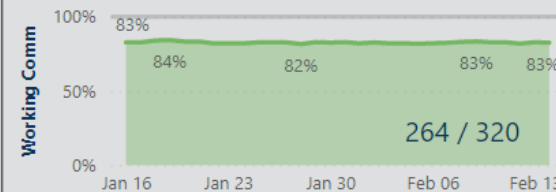
Today

77% ▲

7-Day Running Average

73%

BBU



Today

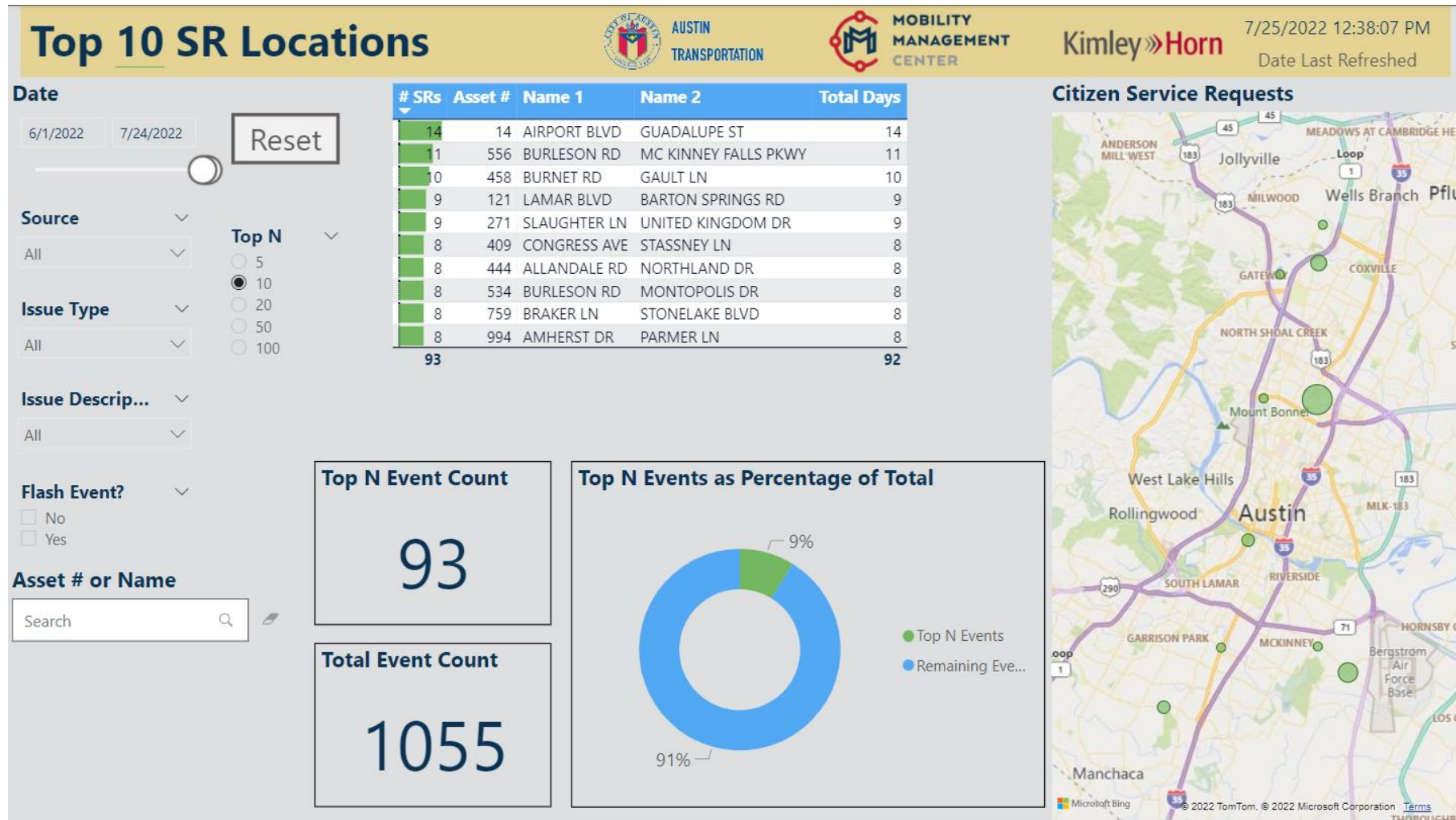
83% ▼

7-Day Running Average

83%



New Tools – Identify Trends in Issues





New Tools – Identify Operational Issues

2022-07-29

All Licensed 2022-07-29

Intersections	Approaches	Movements	Corridors
919	3,060	7,714	15

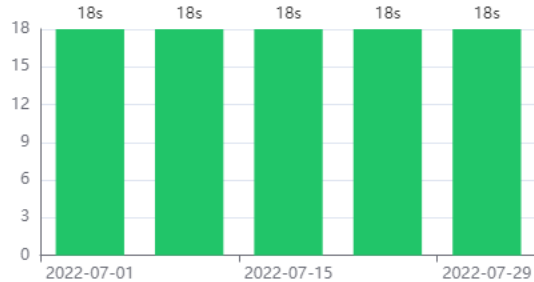
Intersections 2022-07-29

Total Control Delay	4wk Average	Change
4,518.9h	4,238.4h	+ 6.62%

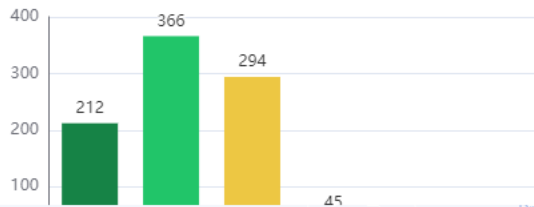
Average Control Delay per Vehicle 2022-07-29

Total Control Delay	4wk Average	Change
18s	18s	0%

Avg Control Delay per Vehicle



Intersection Counts by LOS



Intersections: Top 5 Control Delay Issues

2022-07-29 24 Hours

		4-wk Avg	2022-07-29	Change
Worsened Control Delay (Total)				
1	Howard & McCallen Pass	335h	504.4h	+169.3h +50.5%
2	West Howard Lane & North Lamar Boulevard	292.7h	407.7h	+115.1h +39.3%
3	East Parmer Lane & McCallen Pass	373.9h	469.6h	+95.7h +25.6%
4	West Howard Lane & Center Line Road	137.7h	228.6h	+90.9h +66%
5	West Howard Lane & Metric Boulevard	177.8h	262.3h	+84.5h +47.5%

		4-wk Avg	2022-07-29	Change
Worsened Control Delay (Per Vehicle)				
1	Howard & McCallen Pass	31s	47s	+16s +50.5%
2	West Howard Lane & North Lamar Boulevard	37s	52s	+15s +39.3%
3	West Howard Lane & Center Line Road	17s	28s	+11s +66%
4	West Howard Lane & Metric Boulevard	23s	34s	+11s +47.5%
5	Red River Street & East 8th Street	27s	36s	+9s +33%

Corridors: Top 3 Corridor Issues

2022-07-18 2022-07-25 Weekdays

		4-wk Avg	Current Week	Change
Worsened Travel Times				
1	W Slaughter EB	9m	10m	+1m 11.3%
2	Airport SB	14.1m	14.9m	+47s 5.56%
3	W Parmer WB	10.2m	10.3m	+10s 1.72%

		4-wk Avg	Current Week	Change
Worsened Travel Time Index				
1	S Cameron SB	1.43x	1.73x	+0.29x 20.4%
2	E Parmer EB	1.39x	1.65x	+0.26x 19.1%
3	W Slaughter EB	1.41x	1.51x	+0.10x 7.31%



New Tools – Identify Operational Issues

INRIX Signal Analytics

Help, Settings, 1A, Menu

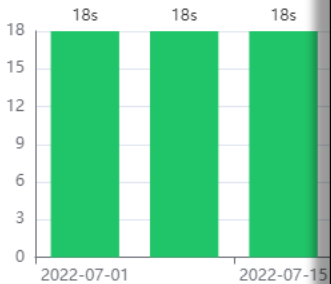
2022-07-29

All Licensed
Intersections: 919
Approaches: 3,060
Movements: 7,710

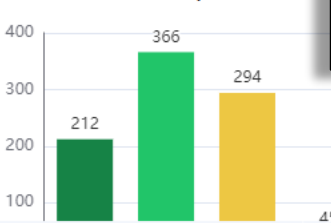
Intersections
Total Control Delay: 4,518.9h
4wk Average: 4,238.4h

Average Control Delay per Vehicle
Total Control Delay: 18s
4wk Average: 18s

Avg Control Delay per Vehicle



Intersection Counts by LOS



Intersections: Top 5 Control Delay Issues

2022-07-29 24 Hours

Worsened Control Delay (Total)

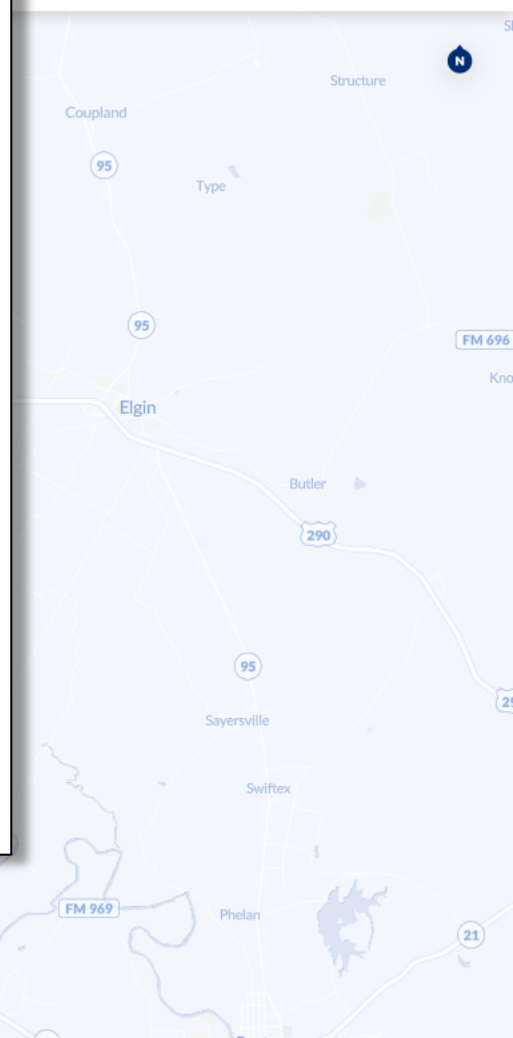
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New Tools – Identify Operational Issues



Signal Analytics



Scheduled Intersection Performance Reports_Austin_2021-05-21_to_2021-05-22

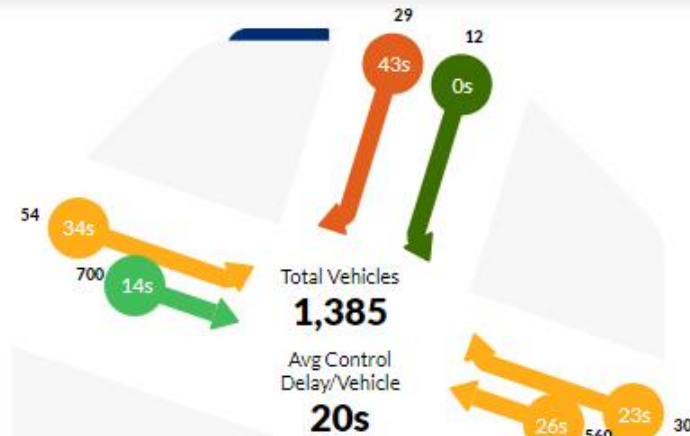
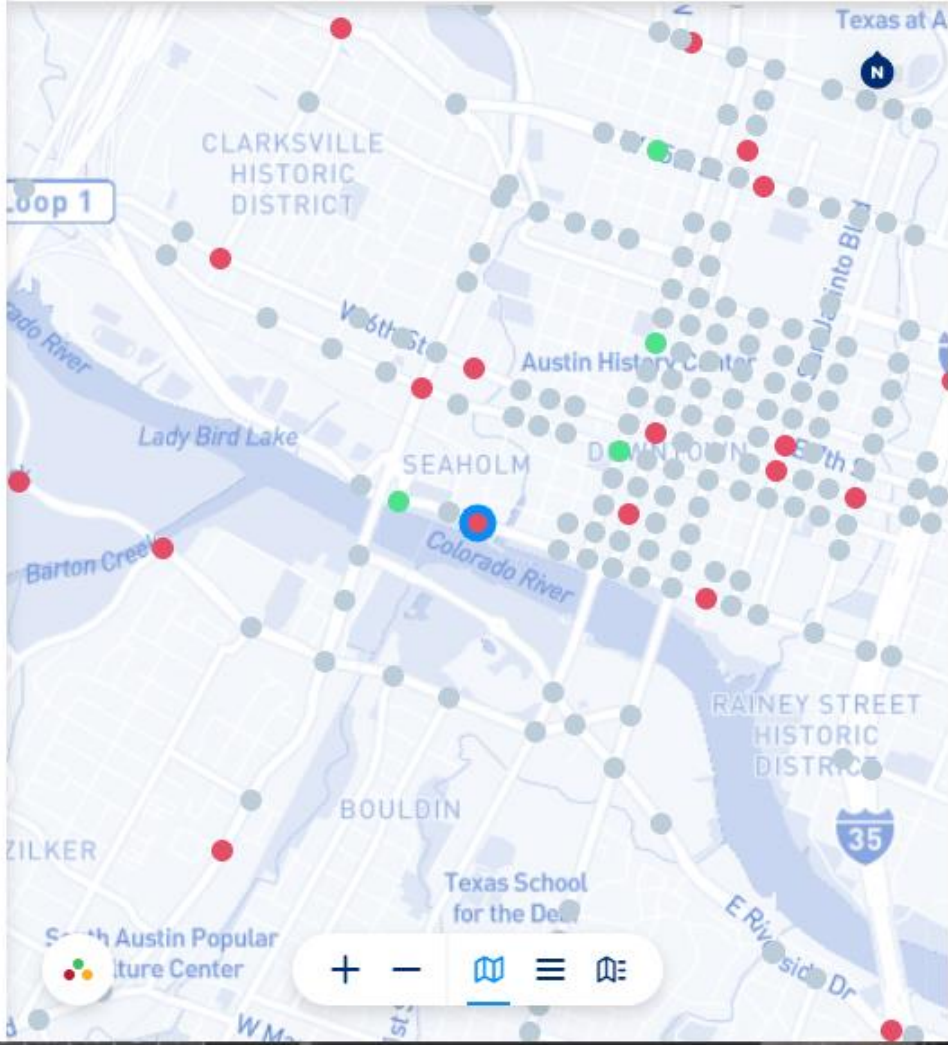
Friday, May 21, 2021

Time Range Display

24 Hours

Intersection Display

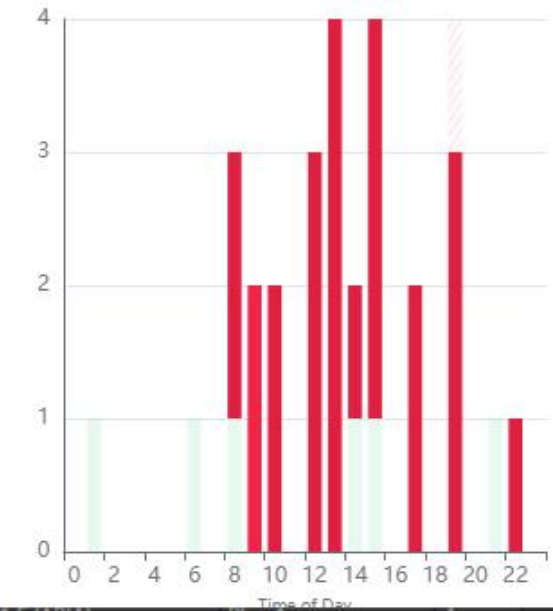
Change in LOS | Avg. Control Delay/Vehicle



1	1.25	- 20%
Vehicle Count	4wk Average	Change
29	27	+ 2
Stopped Count	4wk Average	Change
23	18.75	+ 4.25

Resolution: Hourly

Vehicle Count



METRICS: Avg Control Delay/Vehicle

COUNTS: Observed



MMC Actions Process



Identify Problems

A few hours per week



Investigate Issues

Senior operator



Implement Changes

Signal Timing
Congestion Management
Equipment/Detection Repairs



Track Actions

Excel online



Measure Improvement

Before/After delay
Road user cost
Assume time of effectiveness

MMC Actions



AUSTIN
TRANSPORTATION



MOBILITY
MANAGEMENT
CENTER

Kimley»Horn

7/28/2022 12:53:30 PM

Date Last Refreshed

Issue Resolved Date

1/10/2022

7/13/2022

Action

All

Source

All

Status

All

Target Movement Avg %
Delay Improvement

30%

Target Movement
Weighted Avg Delay
Improvement

16 sec

Target Movement
Impacted Trips

2M

Target Movement
Passenger Vehicle Benefit

\$428K

Avg Target Movement
Benefit per Action

\$5.78K

Total Intersection Avg %
Delay Improvement

9%

Total Intersection
Weighted Avg Delay
Improvement

3 sec

Total Intersection
Impacted Trips

10M

Total Intersection
Passenger Vehicle Benefit

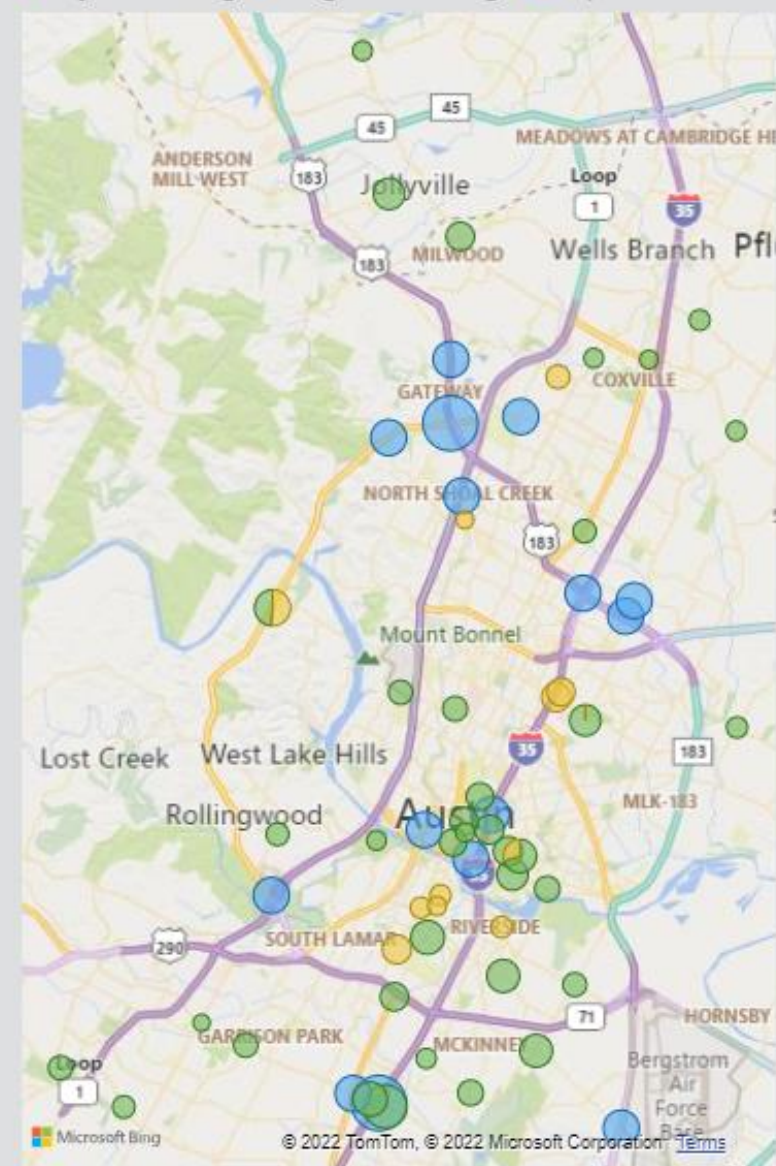
\$499K

Avg Intersection Benefit
per Action

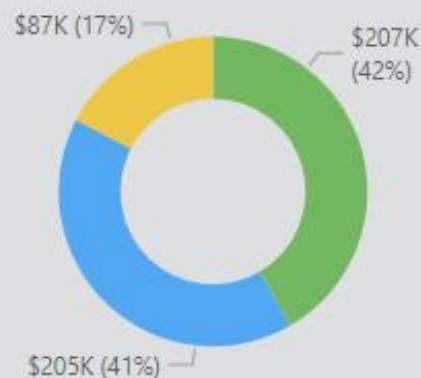
\$6.83K

Action Locations by Category and Impact

● Adjusted timing ● Congestion Manag... ● Repair Ped Det...



Total Benefit by Action Type



Action Type

● Adjusted tim...

● Congestion ...

● Repair Ped D...



Capture Benefit – Tell the Story

AUSTIN JOURNAL

www.ite.org

ENGINEERING NEWS IS THE BEST

- Since 1903

PROACTIVE USE OF SMART CITY DATA IMPROVES TRAFFIC CITY-WIDE



The Austin Mobility Management Center (MMC) has used smart city data to find and fix traffic problems across the City.

In just 6 months, this program has impacted over 10M trips and generated \$500,000 in delay savings to travelers.



Final Thoughts

- Cast a Vision and Goals for your TMC
- Your data may be more accessible than you think
 - See what data you have or could get
 - Use that data to get to your goals
- Track benefits everywhere you can
- Tell your story!



Thanks!

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PREPARED BY

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