



TRANSPORTATION TRAFFIC & LIGHTING



Implementation and After Studies

Pat Callahan, PE





TRANSPORTATION TRAFFIC & LIGHTING



Methodology

Traditional vs ATMS





TRANSPORTATION TRAFFIC & LIGHTING



Traditional Implementation



| WORK ORDER S33213 | | Cheltenham Avenue & 2nd St/Lanfair Avenue | | | | | | | | | | | | | | Traffic Engineering District #3 - ARLE | | | | | | | | | | | | | | |
|----------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--------------------------------|------------------|-----|-----|-------------------------|------|-----|------------------|----|--------------|-----|----------------------------------------|---|---|-----------|----------|---|---|----|--|--|--|--|--|--|--|
| SIGNAL | | Prepared by McCormick Taylor, Inc. | | | | Date 4/2/2014 | | | | Date | | | | Release date | | | | | | | | | | | | | | | | |
| | | Approved by <i>[Signature]</i> | | | | Date 4/3/14 | | | | Date | | | | | | | | | | | | | | | | | | | | |
| | | 3 WBL Cheltenham | | | 4+8+P4+P8 Cheltenham Avenue | | | | 2+6+P2+P6 2nd Street | | | 9 Lanfair Ave | | | | Extension | | | | | | | | | | | | | | |
| # | Phase Movements | Intervals | | | | | | | | | | | | | | Minimums | | | Extension | Maximums | | | | | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Flash | G | M | | FH | G | M | FH | | | | | | | |
| 2 | NB 2nd Street | R | R | R | R | R | R | R | G | G | Y | R | R | R | R | R | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | SB 2nd Street | R | R | R | R | R | R | R | G | G | Y | R | R | R | R | R | | | | | | | | | | | | | | |
| 1 | WB Cheltenham (LT) | <G | <Y | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | EB Cheltenham | R | R | R | G | G | Y | R | R | R | R | R | R | R | R | Y | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | WB Cheltenham | G | G | G | G | G | Y | R | M | M | M | M | R | R | R | Y | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Lanfair Avenue | R | R | R | R | R | R | R | R | R | R | R | G | Y | R | R | | | | | | | | | | | | | | |
| P2 | Crossing Cheltenham Ave | H | H | H | H | H | H | H | M | FH | H | H | H | H | H | OFF | | | | | | | | | | | | | | |
| P6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P4 | Crossing 2nd Street | H | H | H | M | FH | H | H | H | H | H | H | H | H | H | OFF | | | | | | | | | | | | | | |
| P8 | Crossing New 2nd Street | M | M | M | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Program 1 | | 7 | 2.8 | 3.2 | 14 | 9 | 4.2 | 2.8 | 7 | 19 | 4.1 | 2.9 | 7 | 3.4 | 3.6 | 90 secs | | | | | | | | | | | | | | |
| Instructions | | Install timings. Add pedestrian signal timings. Master Controller. Offset referenced to beginning of yellow, phase 4 + 8. Signal to be updated to 170 controller | | | | | | | | | | | | | | | | | | | | | | | | | | | | |





TRANSPORTATION TRAFFIC & LIGHTING



Traditional Implementation





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From Commish.
Complete ASAP!

Knock-down on Kelly
Drive

From oTIS. Make it
work!

Levick & Blvd
in flash.

More 311's from last
shift



Any update on those
retiming work orders?

Union rep
wants a word.

Need you to sit in
on this meeting
for me in an hour

Why has 8th &
Lombard been in
flash for 2 days?





TRANSPORTATION TRAFFIC & LIGHTING



Traditional Implementation





TRANSPORTATION TRAFFIC & LIGHTING



Traditional Implementation





TRANSPORTATION TRAFFIC & LIGHTING



Traditional Implementation





TRANSPORTATION TRAFFIC & LIGHTING



KITS Mobile

Google Maps

Reports

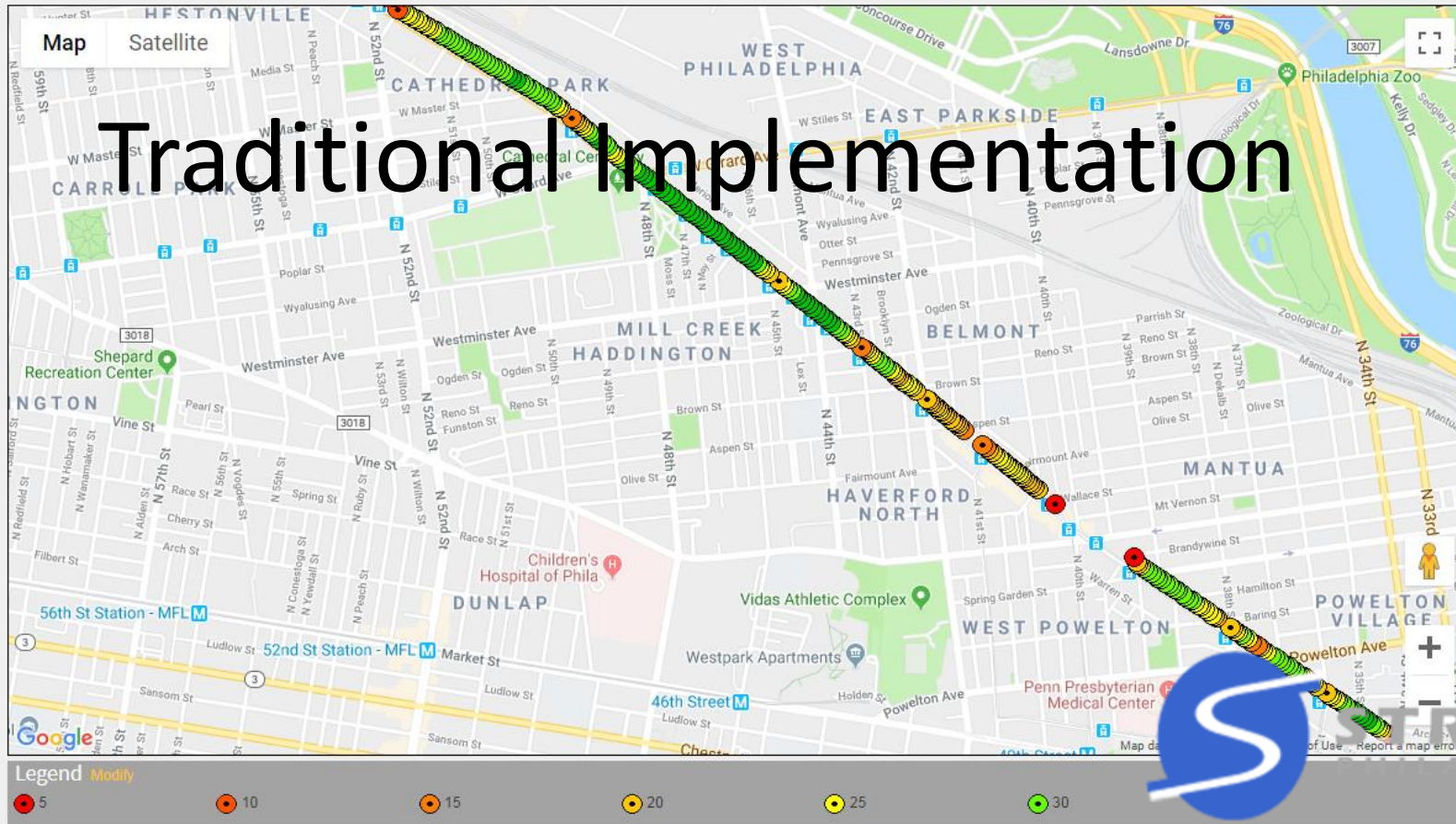
Configuration

Import

Help

Settings

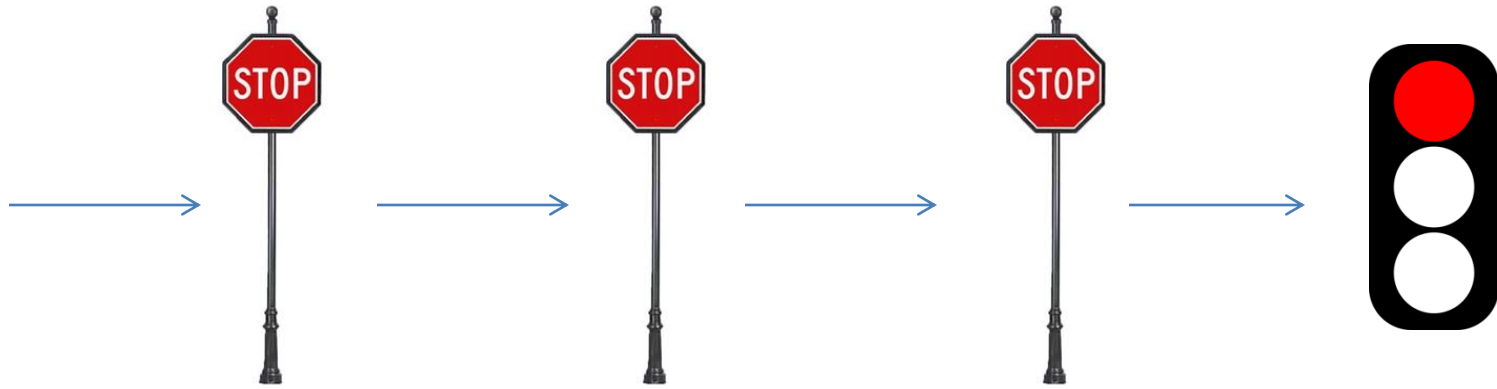
View Trips



STREETS
PHILADELPHIA



TRANSPORTATION TRAFFIC & LIGHTING





TRANSPORTATION TRAFFIC & LIGHTING



Fine Tuning ...Fine what? Are we getting complaints?



| WORK ORDER | | Cheltenham Avenue & 2nd St/Lanfair Avenue | | | | | | | | | | | | | | Traffic Engineering District #3 - ARLE | | | | | | | |
|------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--------------------------------|-------------------|-----|-----|-------------------------|------|-----|-----|------------------|--------------|-----|----------------------------------------|------------------|-----|-----------|----------|--------|------|---------|
| S33213 | | Prepared by McCormick Taylor, Inc. | | | | Date 4/22/2014 | | | | Date | | | | Release date | | | | | | | | | |
| SIGNAL | | Approved by <i>[Signature]</i> | | | | Date 4/21/14 | | | | Date | | | | | | | | | | | | | |
| | | 3 WBL Cheltenham | | | 4+8+P4+P8 Cheltenham Avenue | | | | 2+6+P2+P6 2nd Street | | | | 9 Lanfair Ave | | | | | | Extension | | | | |
| # | Phase Movements | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Flash | Minimums | | | Maximums | | | |
| | | R | R | R | R | R | R | R | G | G | Y | R | R | R | R | R | G | M | FH | G | M | FH | |
| 2 | NB 2nd Street | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | SB 2nd Street | R | R | R | R | R | R | R | G | G | Y | R | R | R | R | R | | | | | | | |
| 1 | WB Cheltenham (LT) | <G | <Y | | | | | | | | | | | | | | | | | | | | |
| 4 | EB Cheltenham | R | R | R | G | G | Y | R | R | R | R | R | R | R | R | Y | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | WB Cheltenham | G | G | G | G | Y | R | M | M | M | M | R | R | R | Y | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Lanfair Avenue | R | R | R | R | R | R | R | R | R | R | G | Y | R | R | | | | | | | | |
| P2 | Crossing Cheltenham Ave | H | H | H | H | H | H | H | M | FH | H | H | H | H | H | OFF | | | | | | | |
| P4 | Crossing 2nd Street | H | H | H | H | H | H | H | H | H | H | H | H | H | H | OFF | | | | | | | |
| P8 | Crossing New 2nd Street | M | M | M | M | FH | H | H | H | H | H | H | H | H | H | OFF | | | | | | | |
| | Program 1 | 7 | 2.8 | 3.2 | 14 | 9 | 4.2 | 2.8 | 7 | 19 | 4.1 | 2.9 | 7 | 3.4 | 3.6 | 90 | secs | | | | | | |
| | | | | | | | | | | | | | | | | | Time of Day Plan | | | | | | |
| | | | | | | | | | | | | | | | | | Event | Day | Time | Cycle | Offset | Plan | Remarks |
| | | | | | | | | | | | | | | | | | 1 | 1-7 | 0:00 | 90 | 0 sec | 1 | |
| | Instructions | Install timings. Add pedestrian signal timings. Master Controller. Offset referenced to beginning of yellow, phase 4 + 8. Signal to be updated to 170 controller | | | | | | | | | | | | | | | | | | | | | |





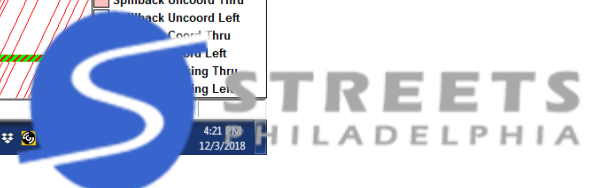
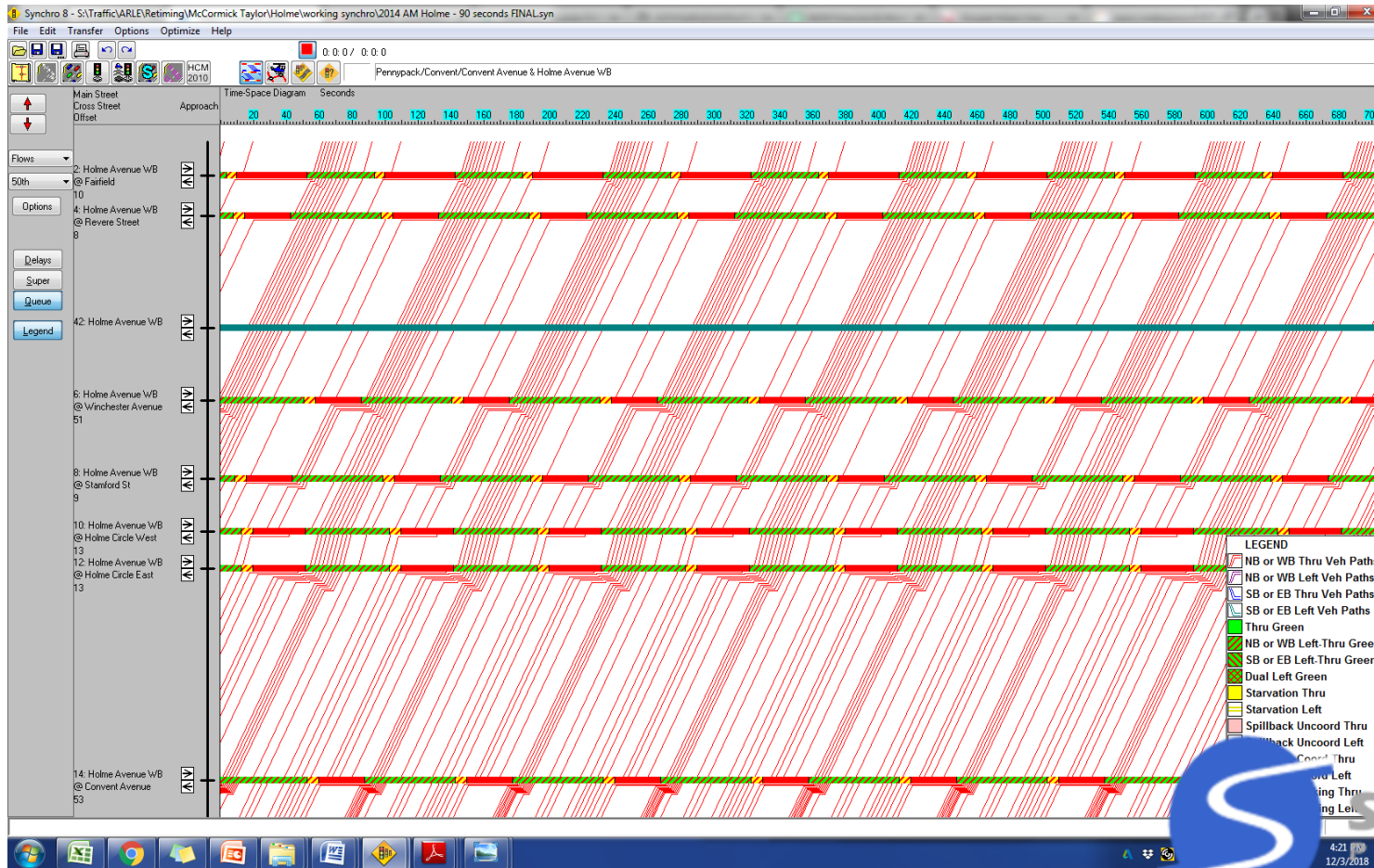
TRANSPORTATION TRAFFIC & LIGHTING



STREETS
PHILADELPHIA

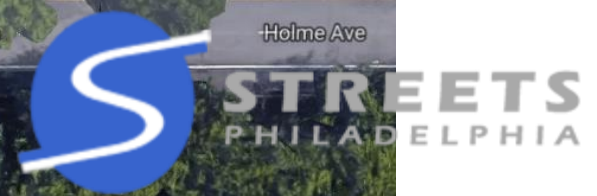


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TRANSPORTATION TRAFFIC & LIGHTING





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Fine Tuning

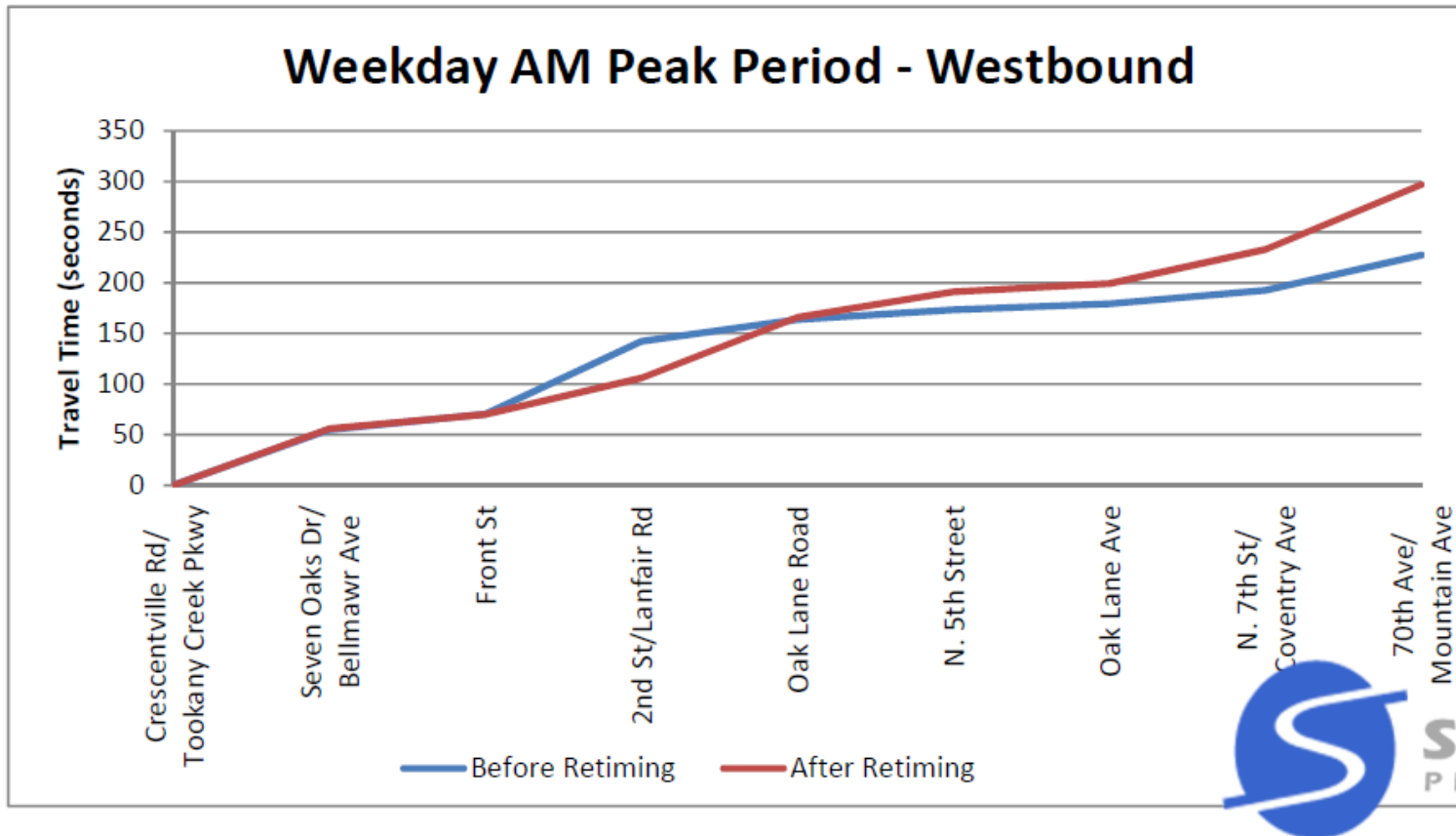




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Traditional Implementation

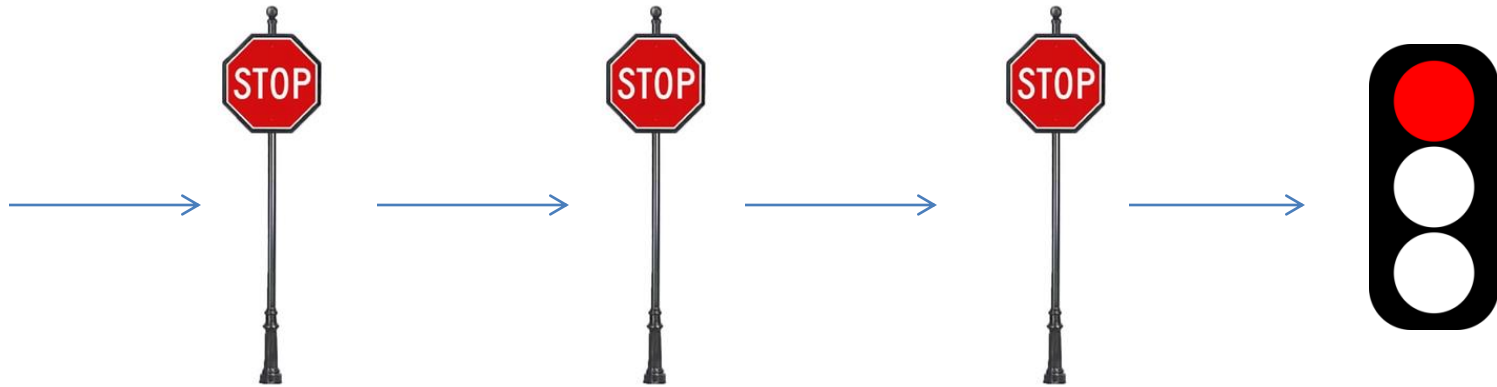




TRANSPORTATION TRAFFIC & LIGHTING



Traditional Implementation



ATMS Implementation

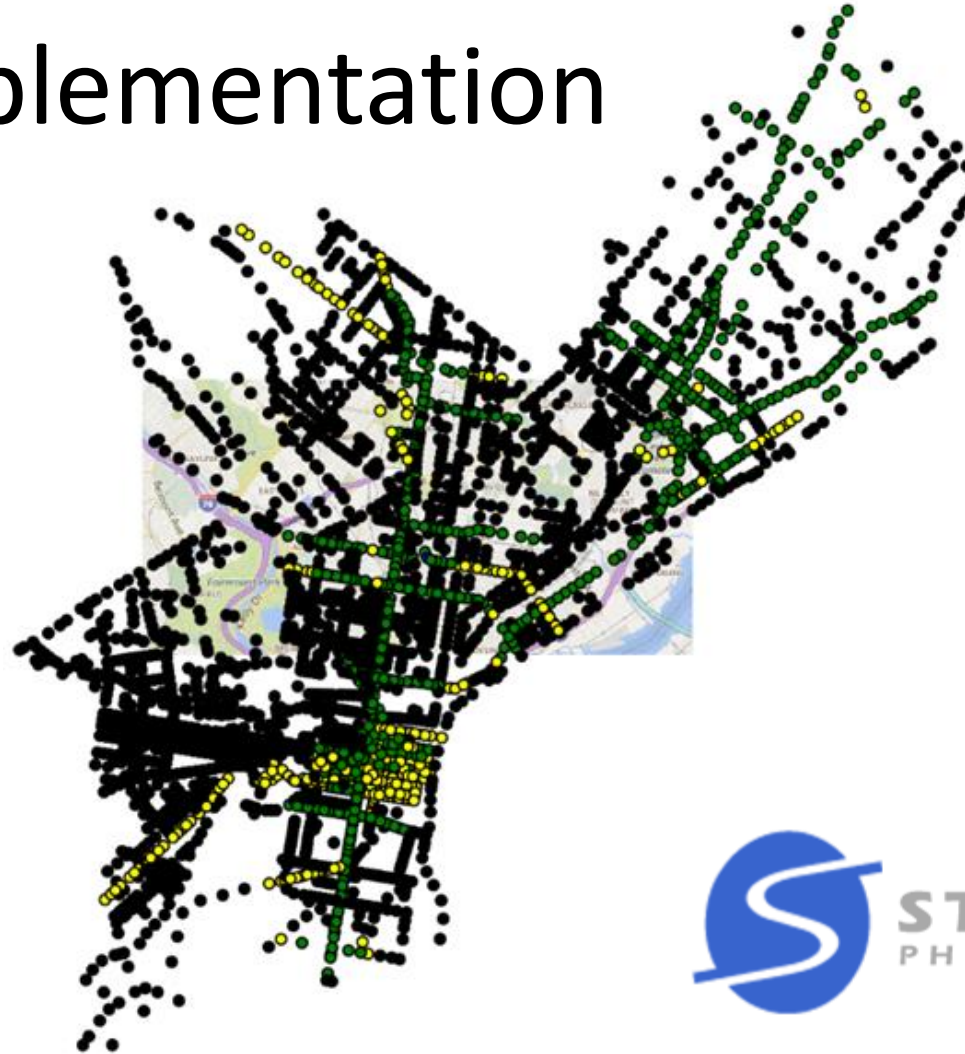




TRANSPORTATION TRAFFIC & LIGHTING



ATMS Implementation

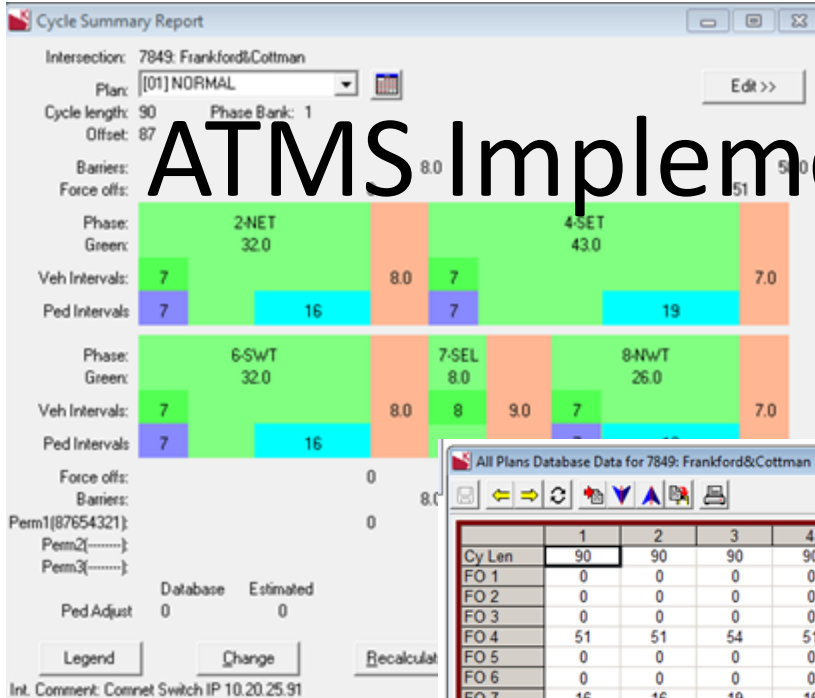




TRANSPORTATION TRAFFIC & LIGHTING



ATMS Implementation



Phase Bank 1 Database Data for 7849: Frankford&Cottman

| | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Phase 6 | Phase 7 | Phase 8 |
|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Phase Bank 1 | NET | | SET | | SWT | SEL | NWT | |
| Walk | 0 | 7 | 0 | 7 | 0 | 7 | 0 | 7 |
| Don't Walk | 0 | 16 | 0 | 19 | 0 | 16 | 0 | 19 |
| Min Initial | 4 | 7 | 1 | 7 | 4 | 7 | 8 | 7 |
| Type 3 Limit | 0 | 20 | 0 | 20 | 0 | 20 | 0 | 20 |
| Add Per Vehicle | 0.2 | 0.2 | 0.2 | 3.0 | 0.2 | 0.2 | 0.2 | 3.0 |
| Veh Ext | 0.2 | 0.2 | 0.2 | 3.0 | 0.2 | 0.2 | 0.2 | 3.0 |
| Max Gap | 0.2 | 0.2 | 0.2 | 3.0 | 0.2 | 0.2 | 0.2 | 3.0 |
| Min Gap | 0.2 | 0.2 | 0.2 | 3.0 | 0.2 | 0.2 | 0.2 | 3.0 |
| Max Limit | 0 | 28 | 0 | 28 | 0 | 28 | 8 | 28 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 3.0 | 4.0 | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| | 0.0 | 3.0 | 2.0 | 4.0 | 5.0 | 3.0 | | |
| | 0 | 20 | 0 | 20 | 0 | 20 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |

All Plans Database Data for 7849: Frankford&Cottman

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Cy Len | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| FO 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FO 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FO 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FO 4 | 51 | 51 | 54 | 51 | 51 | 51 | 51 | 51 | 51 | 51 |
| FO 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FO 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FO 7 | 16 | 16 | 19 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| FO 8 | 51 | 51 | 54 | 51 | 51 | 51 | 51 | 51 | 51 | 51 |
| Rng Off | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Offset | 87 | 87 | 87 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Syn Ph | -2--6-- | -2--6-- | -2--6-- | -2--6-- | -2--6-- | -2--6-- | -2--6-- | -2--6-- | -2--6-- | -2--6-- |
| Lag Ph | -2-4-6-8 | -2-4-6-8 | -2-4-6-8 | -2-4-6-8 | -2-4-6-8 | -2-4-6-8 | -2-4-6-8 | -2-4-6-8 | -2-4-6-8 | -2-4-6-8 |
| En Pm 1 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| Hld Rel | 255 | 255 | 255 | 255 | 255 | 255 | 255 | 255 | 255 | 255 |
| Zon Off | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Plan Mode: Coord Coord Coord Coord Coord Coord Coord Coord Coord Coord
Plan Name: NORM PM PM 120B 120T 120W EBRK MID 95NB

Last Modification Date: 02/21/2018, 11:37:45 am
Int. Comment: Connet Switch IP 10.20.25.91
Validate Data
Version: Current Clear Highlights
81233TLH HC11
7849 : Frankford & Cottman

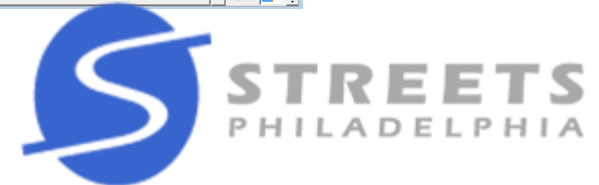
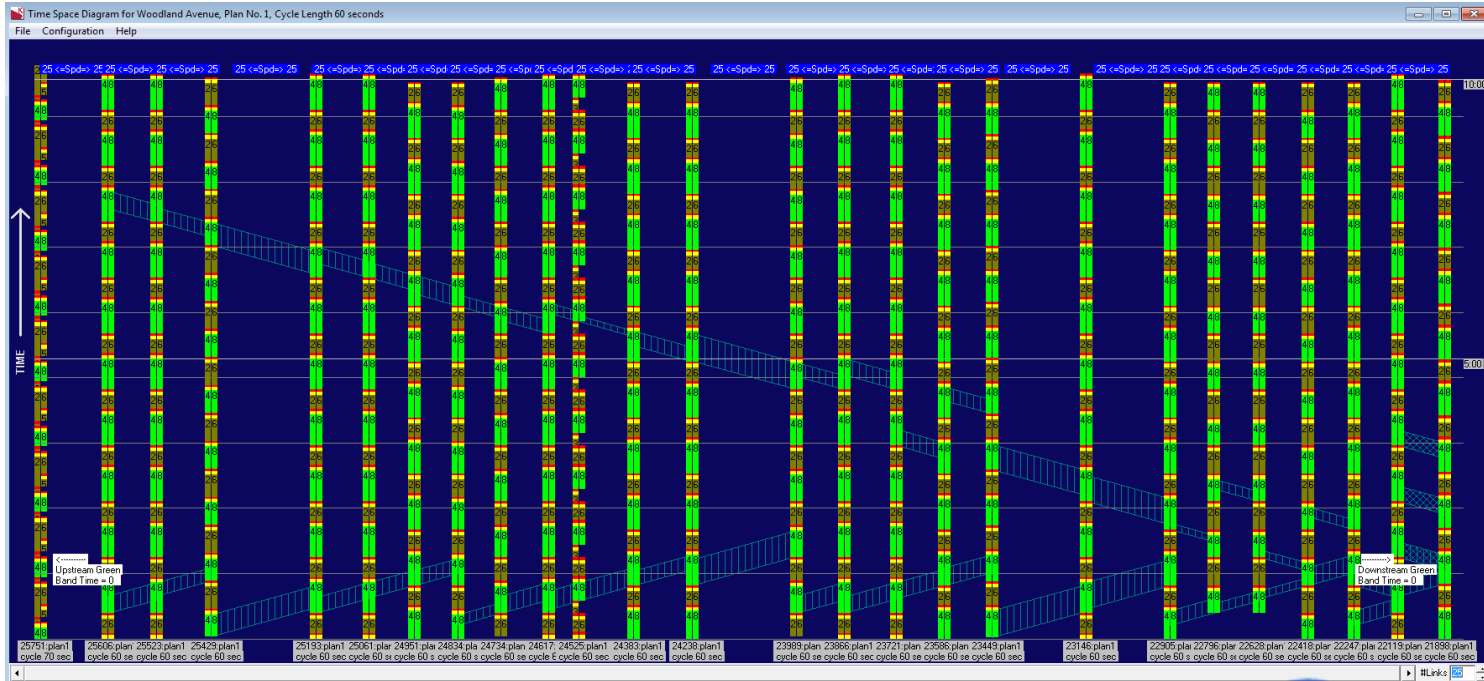




TRANSPORTATION TRAFFIC & LIGHTING



ATMS Implementation





TRANSPORTATION TRAFFIC & LIGHTING

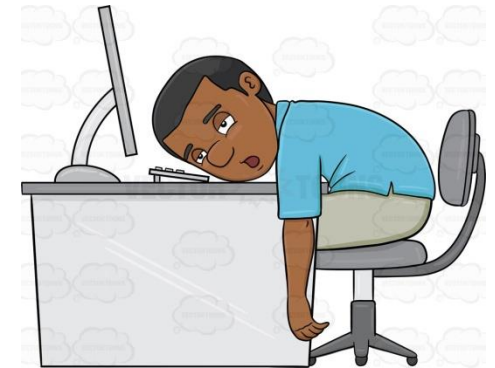


ATMS Implementation

Fine Tuning/real-time optimization



Uhh let's make the
offset 3 sec later





TRANSPORTATION TRAFFIC & LIGHTING



ATMS Implementation

KITS Mobile

Google Maps

Reports

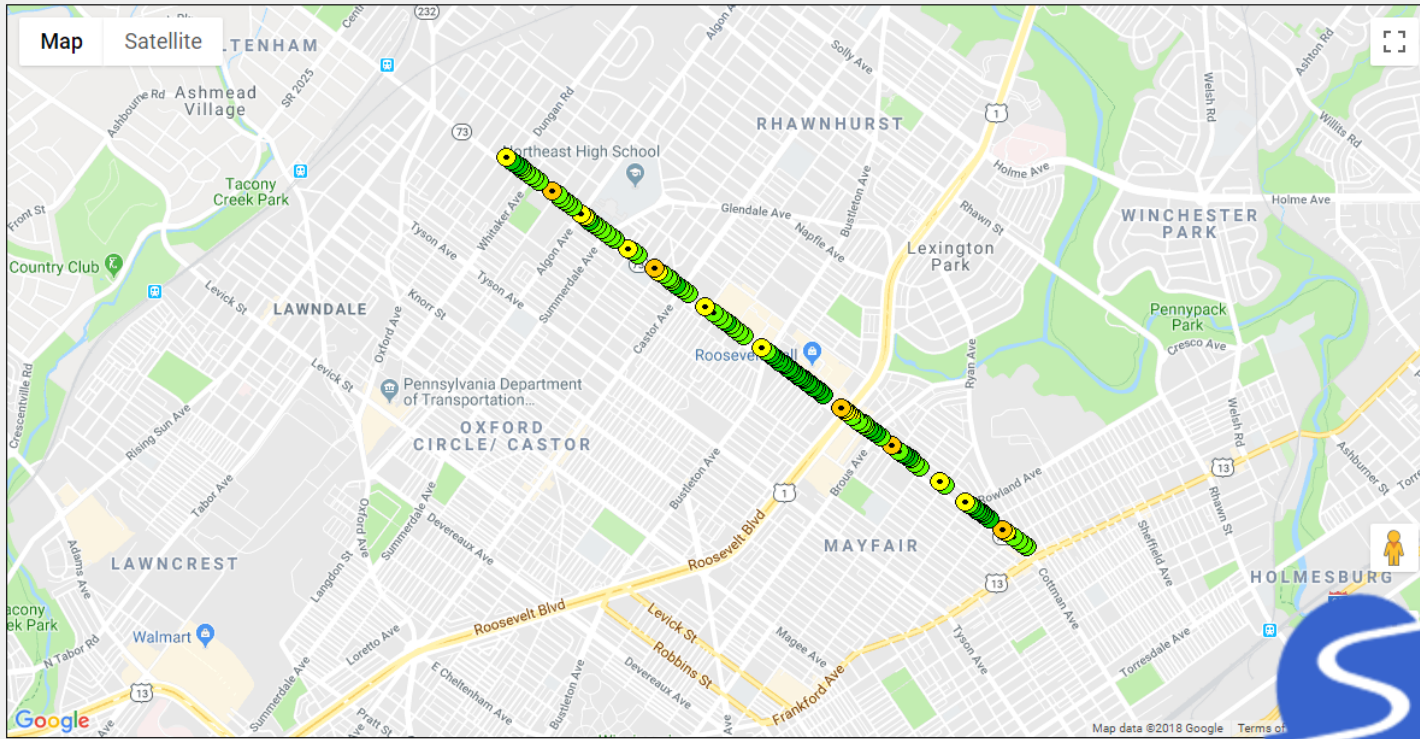
Configuration

Import

Help

Settings

View Trips



Cottman Ave:

9% drop EB.

39% drop WB



**STREETS
PHILADELPHIA**



TRANSPORTATION TRAFFIC & LIGHTING



Cottman Ave & The Blvd: Before





TRANSPORTATION TRAFFIC & LIGHTING



ATMS Implementation: Cottman Ave

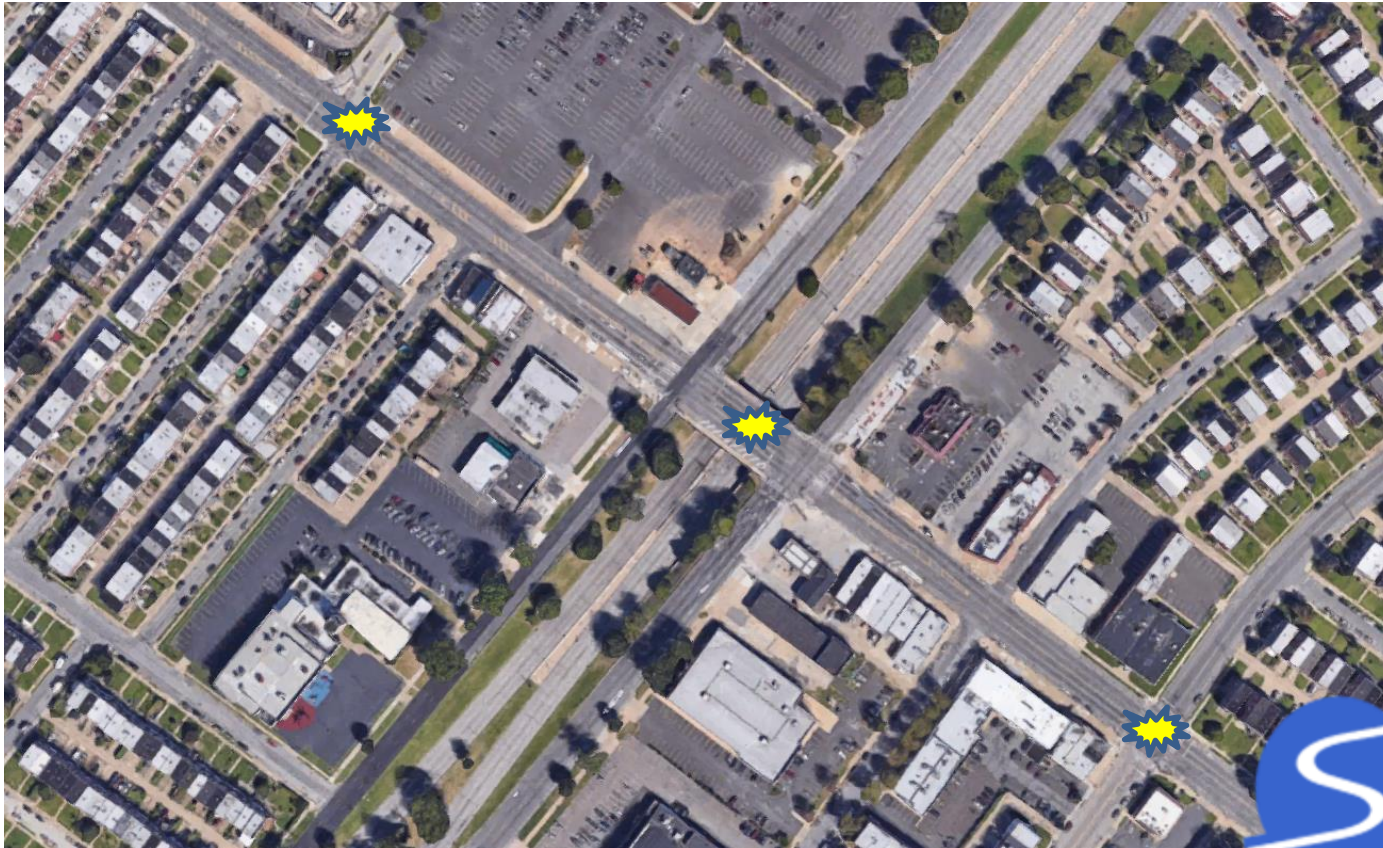




TRANSPORTATION TRAFFIC & LIGHTING



ATMS Implementation: Cottman Ave



Weekday



Weekend



STREETS
PHILADELPHIA



TRANSPORTATION TRAFFIC & LIGHTING

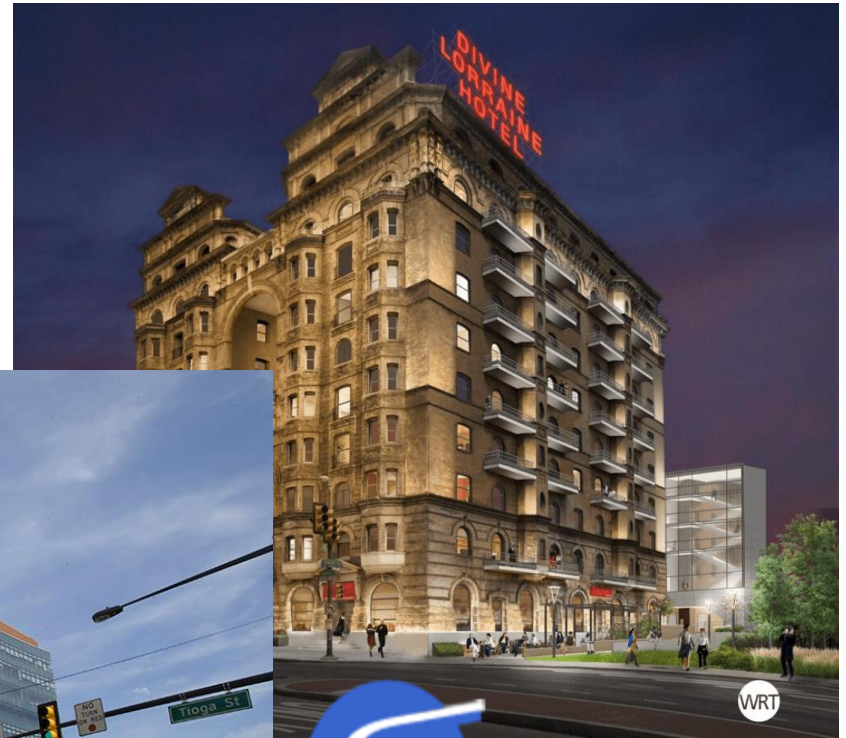


ATMS Implementation: N Broad St

62 signals: Stenton Ave to Spring Garden

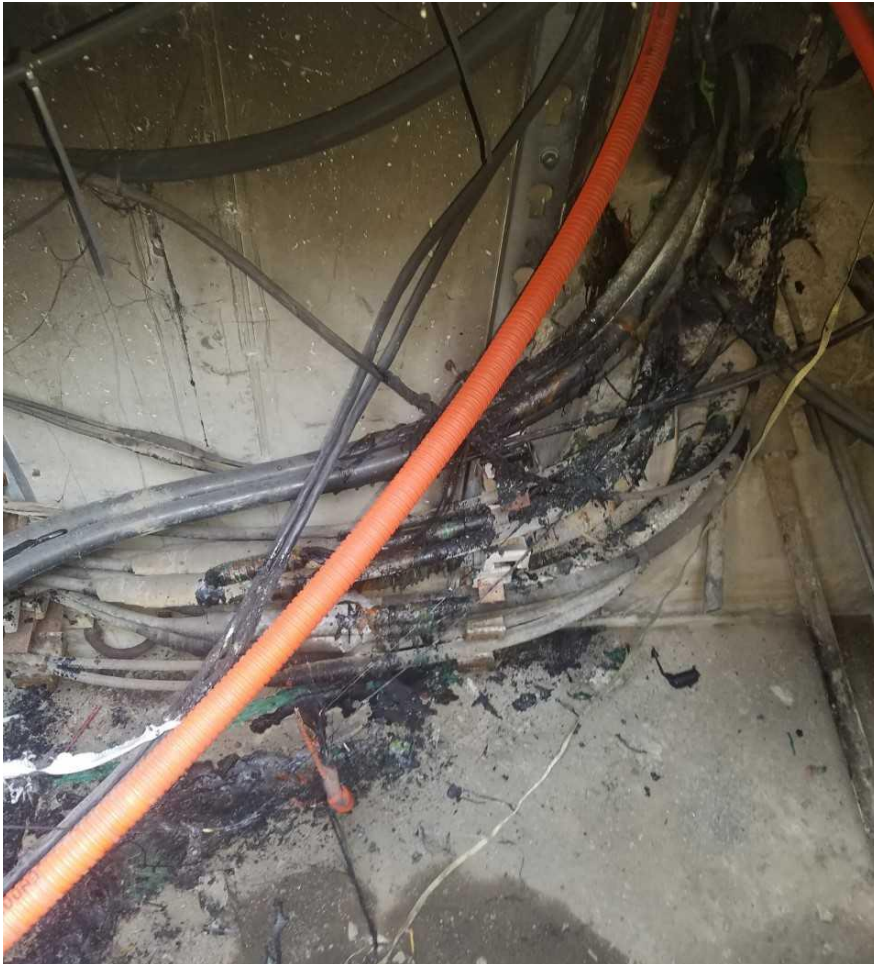
AM, PM, off peak progression

LPI's





TRANSPORTATION TRAFFIC & LIGHTING



Approx 1/3 of integrated signals are
in comm fail

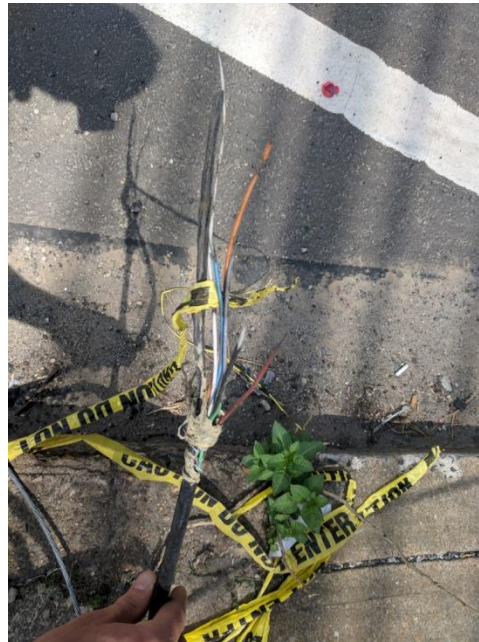


TRANSPORTATION TRAFFIC & LIGHTING





TRANSPORTATION TRAFFIC & LIGHTING



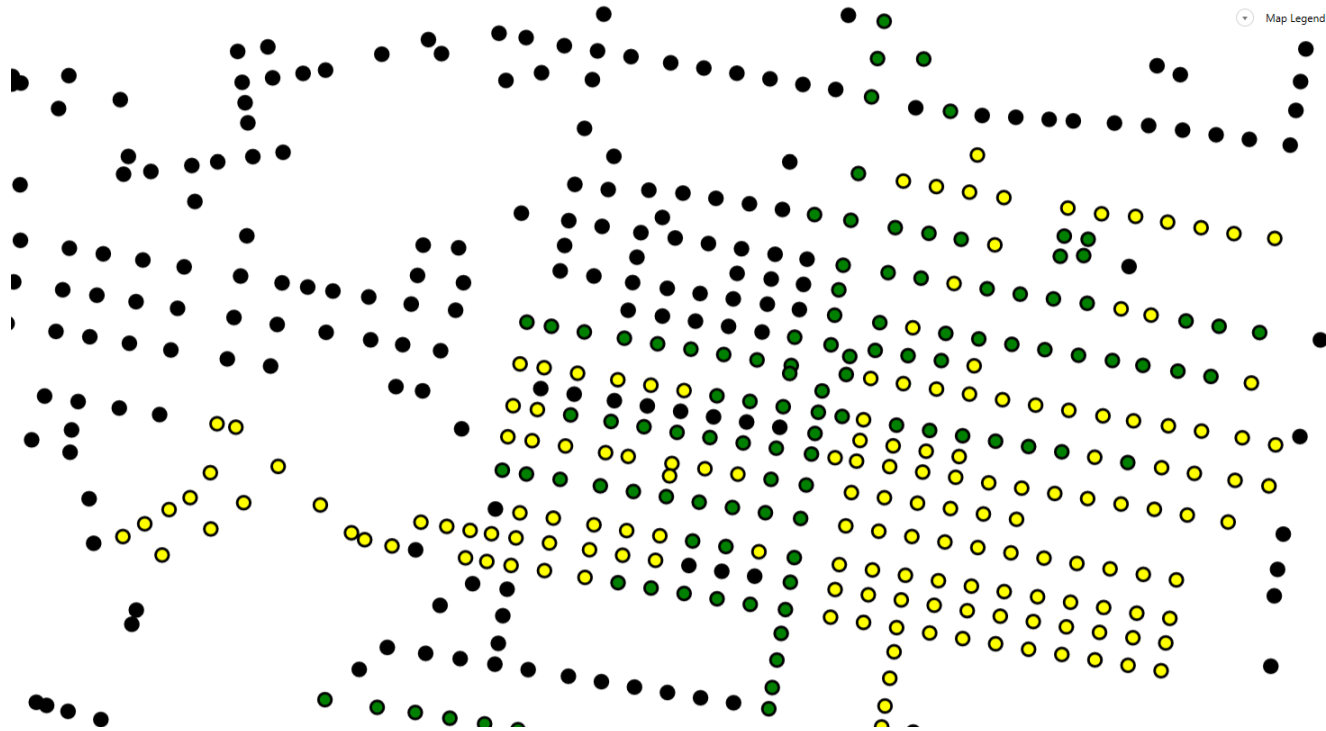


TRANSPORTATION TRAFFIC & LIGHTING





TRANSPORTATION TRAFFIC & LIGHTING





TRANSPORTATION TRAFFIC & LIGHTING



Long term progression maintenance

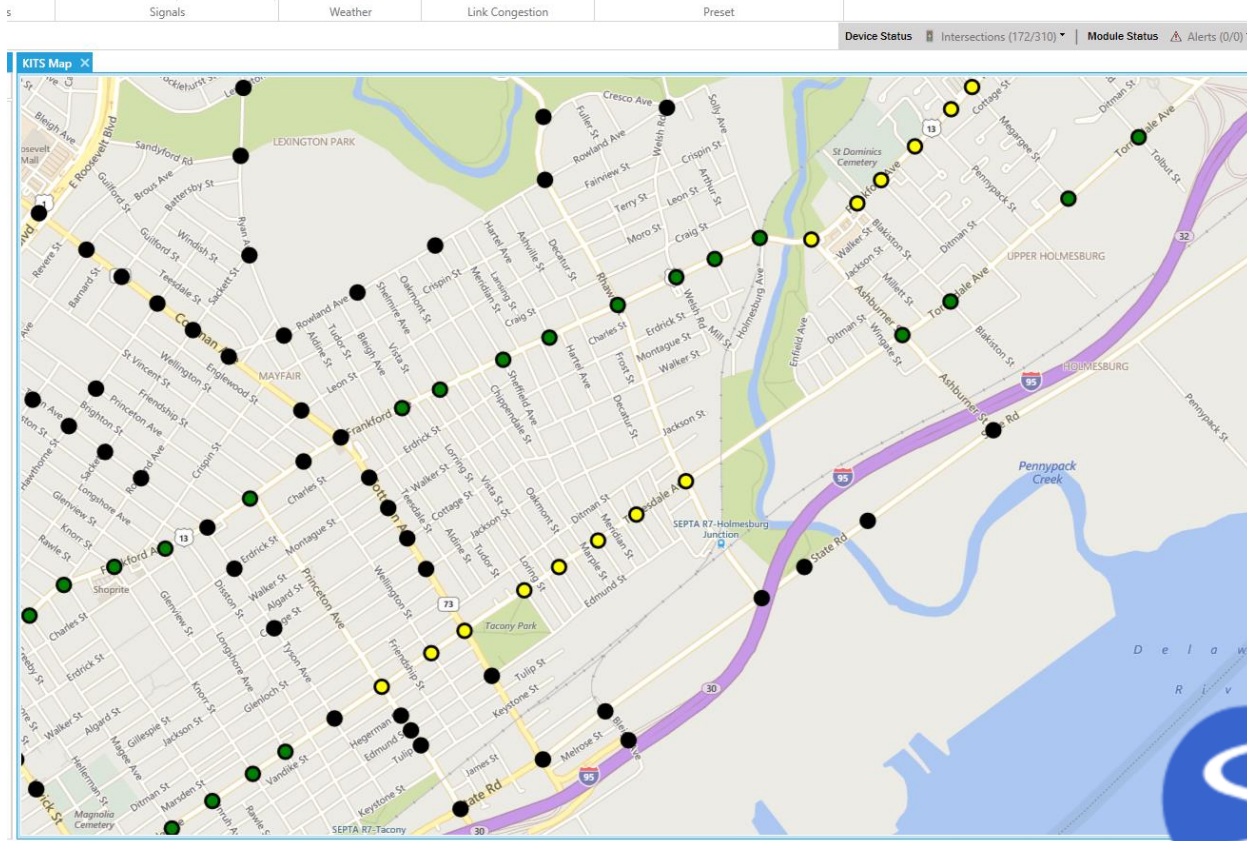




TRANSPORTATION TRAFFIC & LIGHTING



Long term progression maintenance





TRANSPORTATION TRAFFIC & LIGHTING



All implementations I've discussed
have been fixed time



TRANSPORTATION TRAFFIC & LIGHTING



Traditional:

Pro's

- Better records

Con's

- Slow, inefficient process
- Minimal fine tuning/second chances
- Don't know if comm is broken until there is a progression problem

ATMS:

Pro's

- Fast implementation
- Able to see comm fails immediately in ATMS map
- Unlimited attempts to get it right.
- Time of day

Con's

- Heavily dependent on functioning comm and an adaptable workforce
- Historical timing records need to be translated





TRANSPORTATION TRAFFIC & LIGHTING



Final thoughts:

- Having the TOC on site at the traffic shop was a wise choice
 - Functional relationship with the signal techs is critical
- Residency requirement helps traffic
- There is no magic elixir



75% reduction in
travel times!!!

