

Traffic Study

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Sr. VP

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TTG Project Involvement

- TTG Began working on Project April 2016
- Assisting w/ Loading / Truck Simulations
- Assisting w/ Site Design
- Assisting w/ Internal Garage
- Traffic Vehicle Counts
- Pedestrian Counts
- Traffic Study
- Intersection Designs

Traffic Study

- Existing Traffic
- Background Traffic
- Total Traffic
- AM Peak = 7:30-8:30 PM Peak = 5:15-6:15
- Site Traffic
 - AM = 47 In / 12 Out
 - PM = 70 In / 94 Out
- Prepared a Model
- Study Total Traffic Improvement Options

Delay Info:

SimTraffic Simulation

| | | Existing Traffic | Background Traffic | Total Traffic | Total Traffic w/lmp. |
|--|------------------------------|------------------|--------------------|-----------------|----------------------|
| Morning Peak Hour Traffic | HCM Delay Standard (sec/veh) | Delay (sec/veh) | Delay (sec/veh) | Delay (sec/veh) | Delay (sec/veh) |
| 1. Ethan Allen Ave & Carroll Ave/Grant Ave | 80 | 68.1 | 89.8 | 93.1 | 14.8 |
| 1a. Ethan Allen Ave & Sycamore Ave | 80 | 151.9 | 147.1 | 154.2 | |
| 2. Carroll Ave & Philadelphia Ave | 80 | 9.2 | 10.0 | 9.8 | 10.1 |
| 3. Carroll Ave & Site Access | 80 | | | 1.5 | 1.7 |
| Evening Peak Hour Traffic | | | | | |
| 1. Ethan Allen Ave & Carroll Ave/Grant Ave | 80 | 34.3 | 35.1 | 31.2 | 12.8 |
| 1a. Ethan Allen Ave & Sycamore Ave | 80 | 41.5 | 39.3 | 54.1 | |
| 2. Carroll Ave & Philadelphia Ave | 80 | 41.1 | 44.8 | 93.3 | 18.5 |
| 3. Carroll Ave & Site Access | 80 | | | 21.4 | 3.4 |

Note: SimTraffic results are based on 10 simulation runs.

Existing Paved Lot Info

- Existing Lot contains Approximately 49 Painted Spaces with Co-Op Loading area.
- Passenger vehicles including delivery trucks access the paved lot midway between signals.

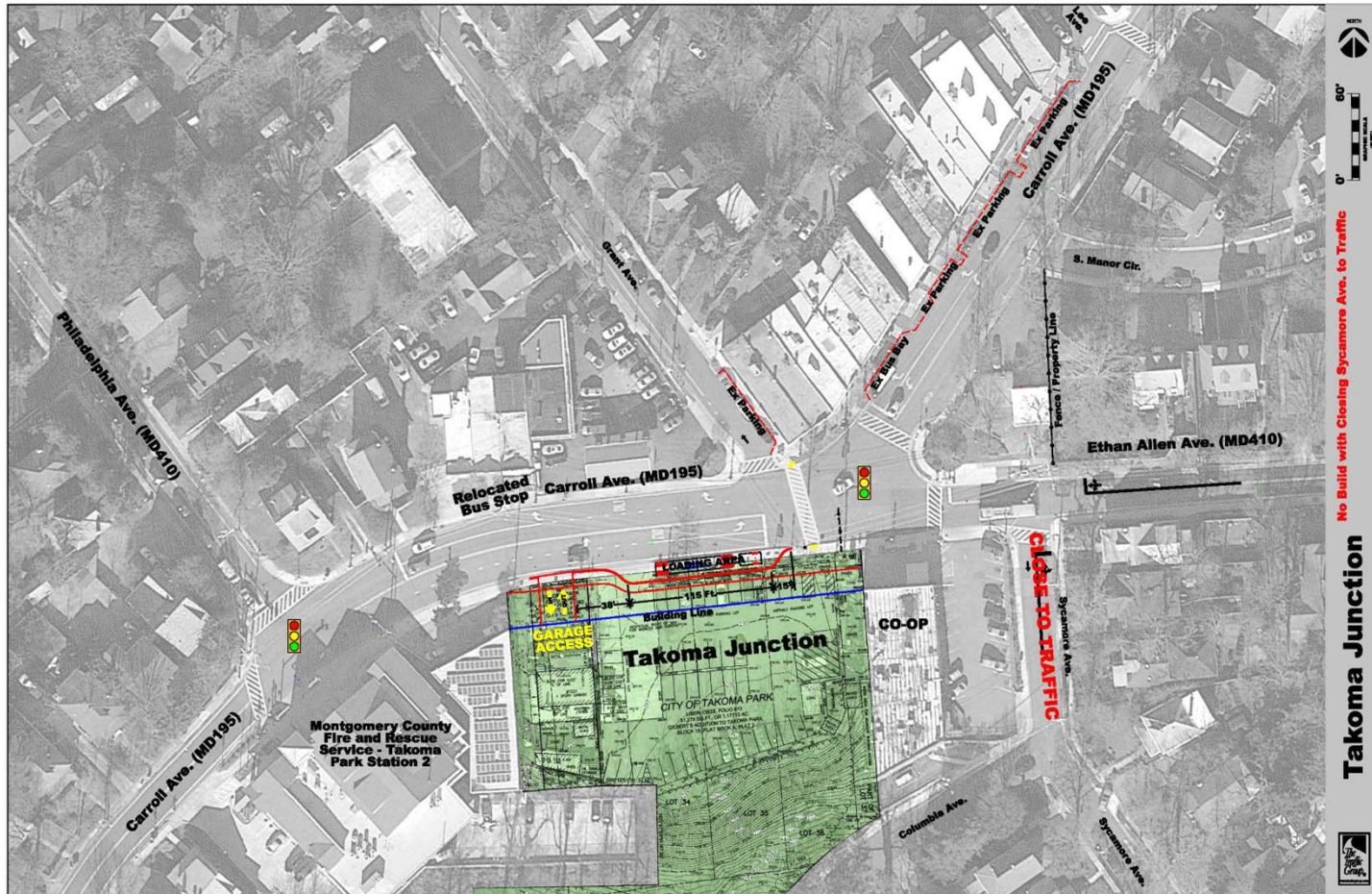
Proposed Garage Info

- Proposed underground garage contains 70 Parking Spaces.
- Garage access is located along western side.

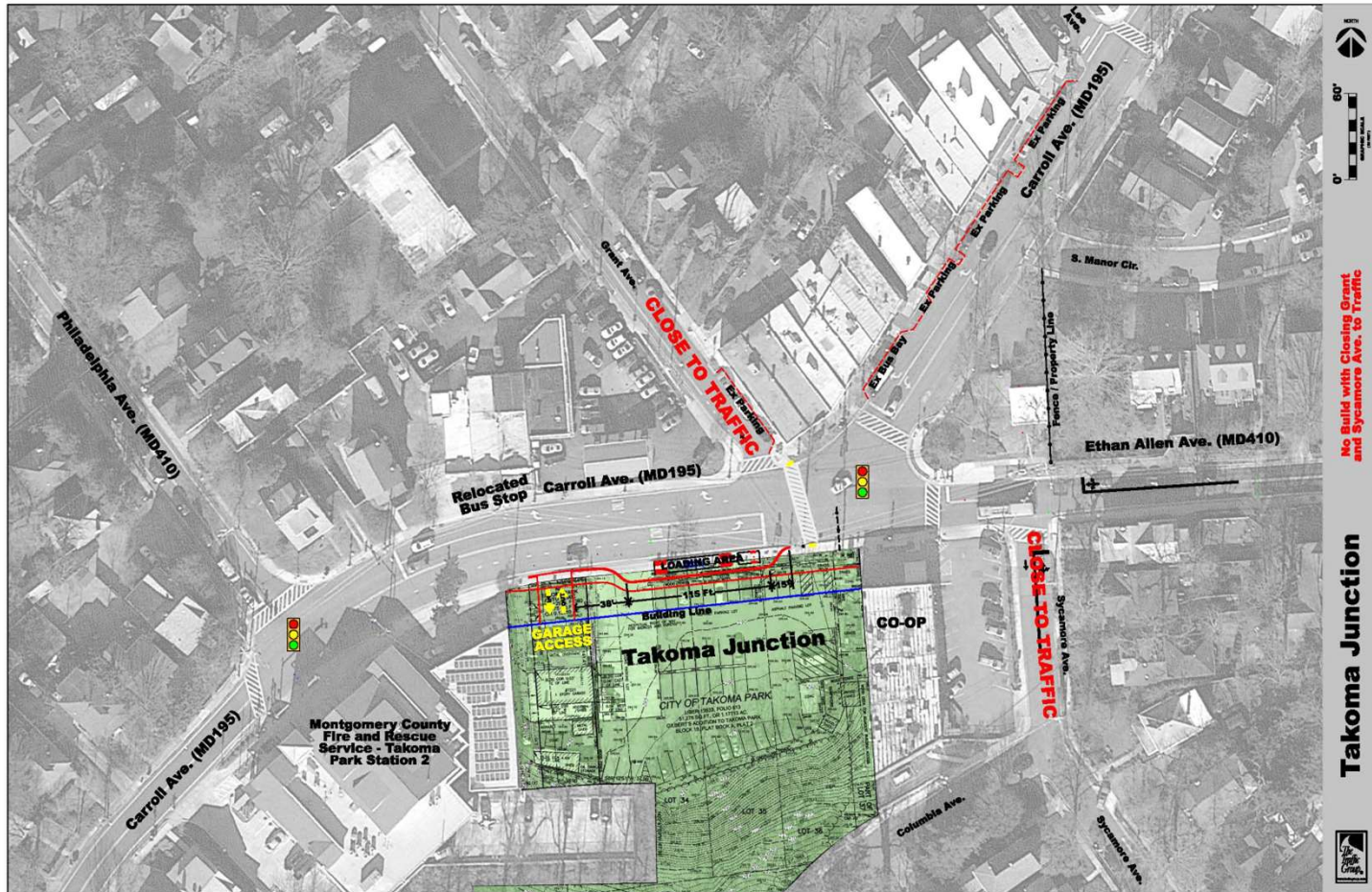
Improvement Alternatives



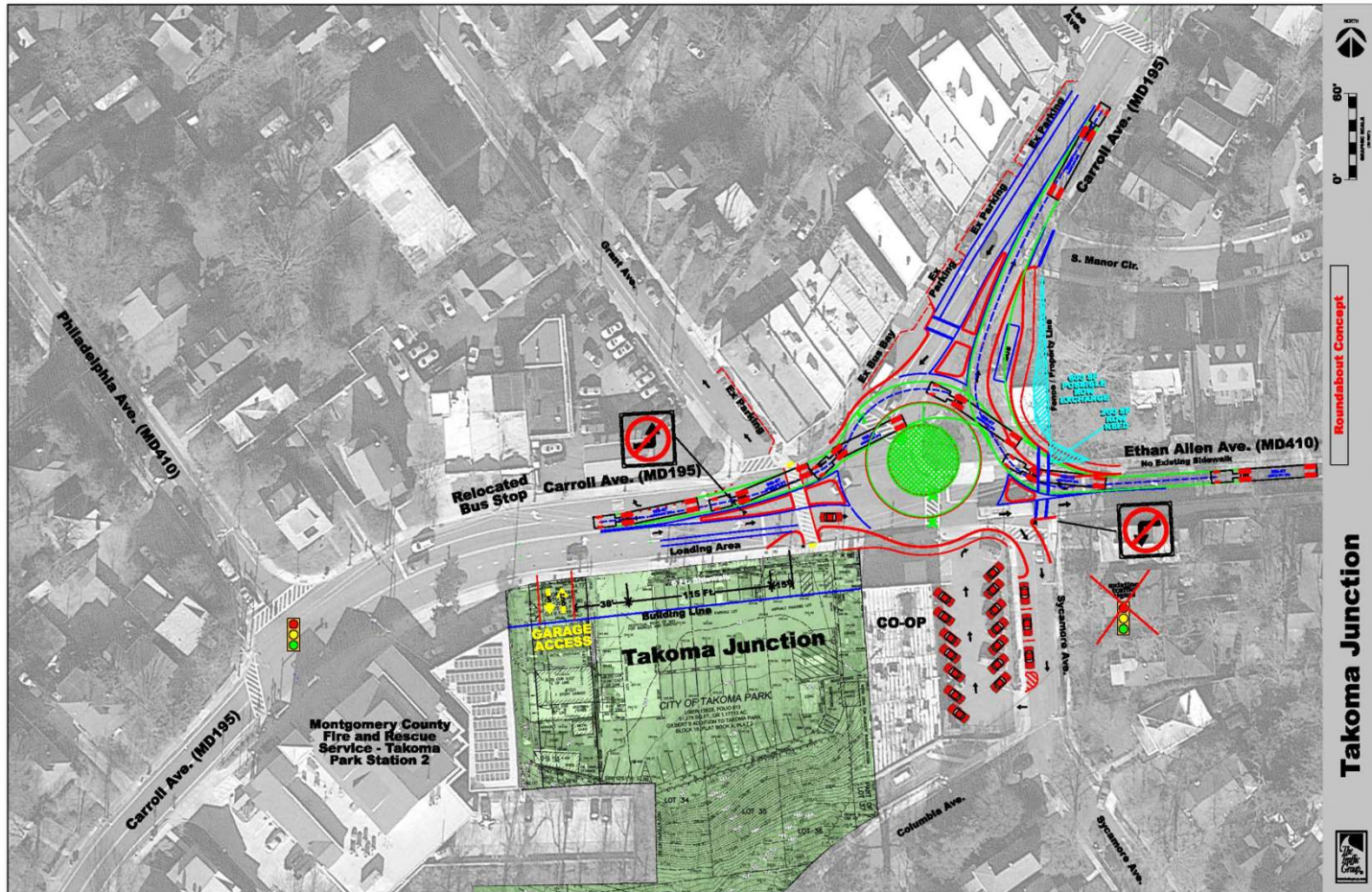
Improvement Alternatives



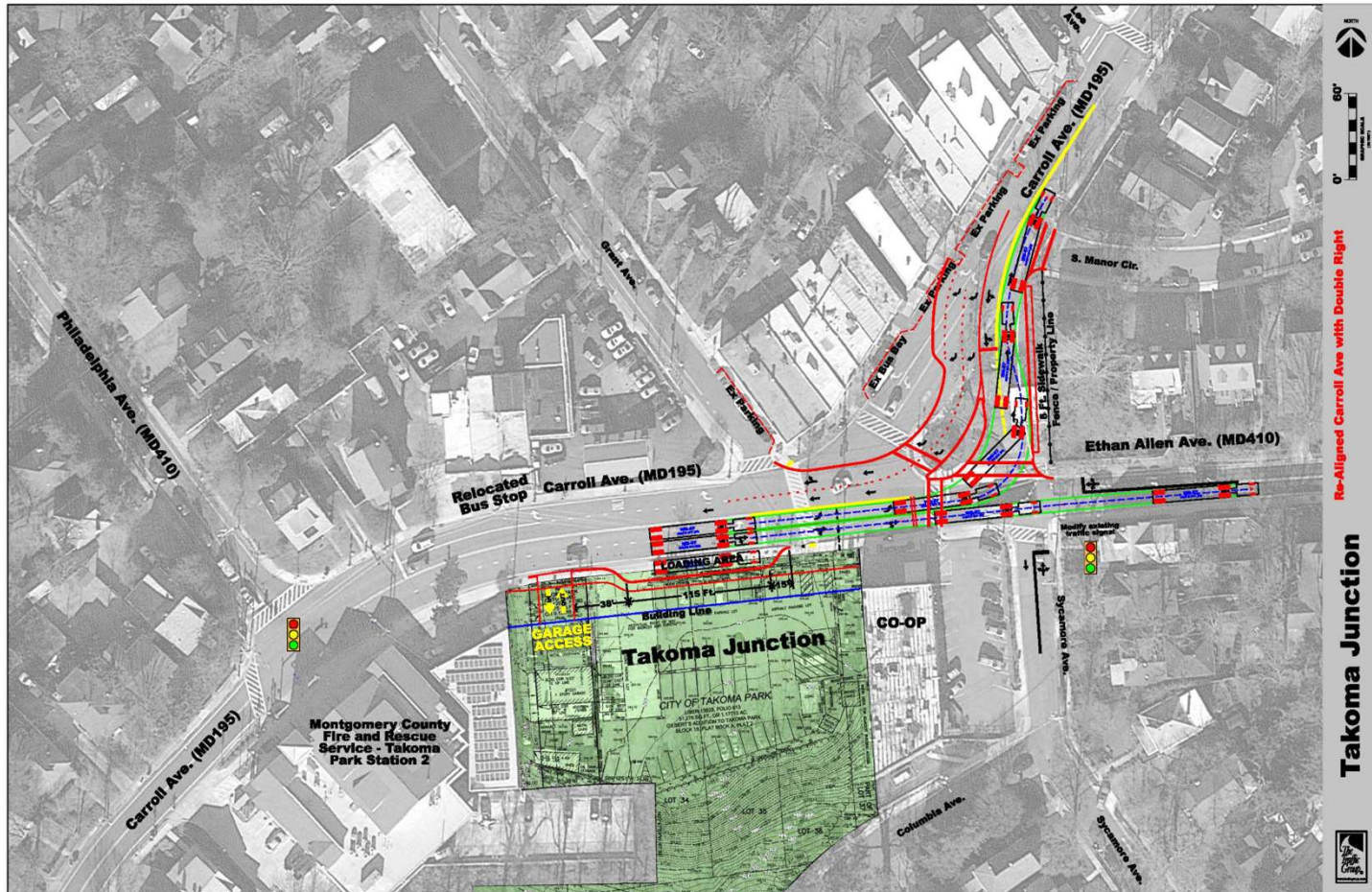
Improvement Alternatives



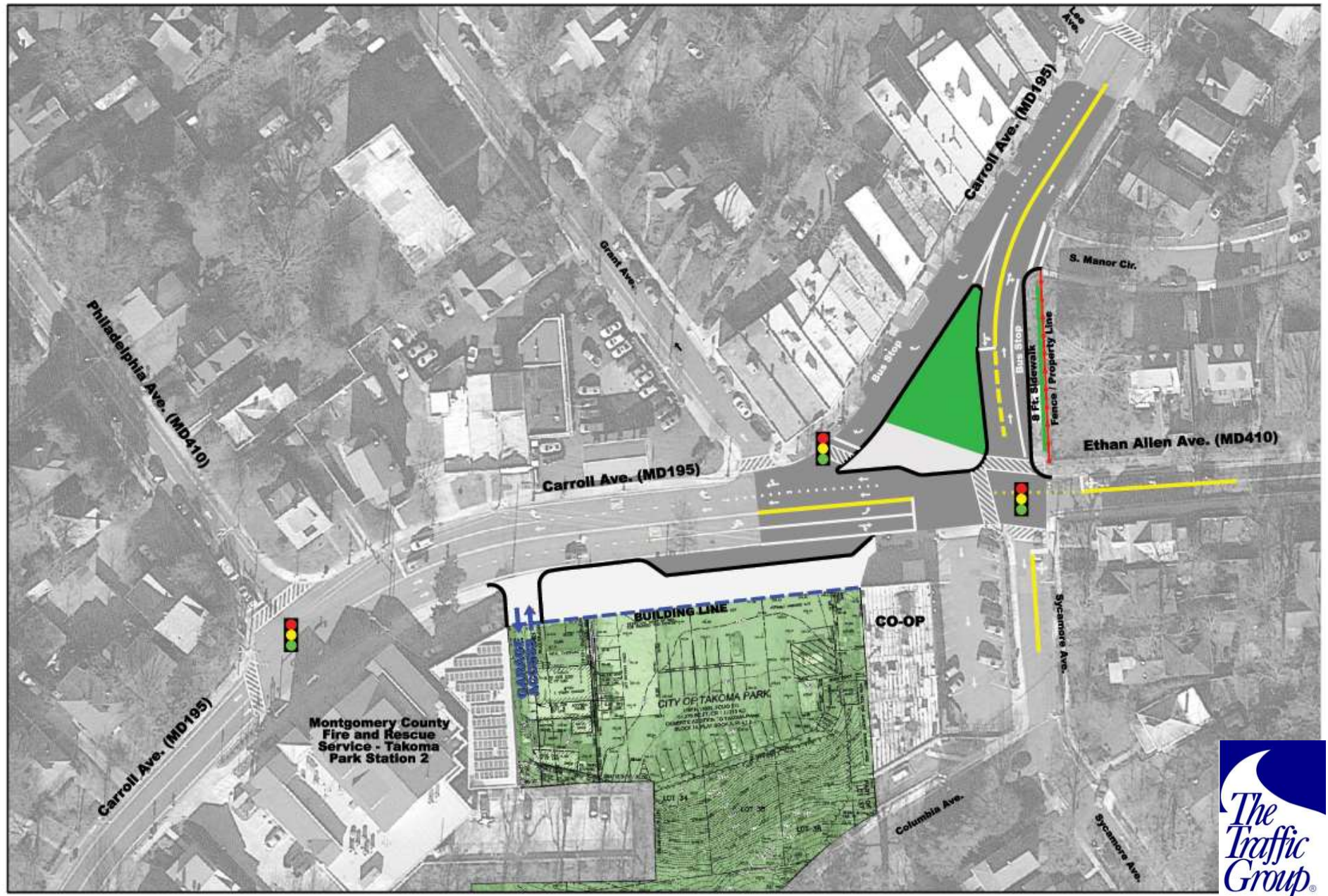
Improvement Alternatives



Improvement Alternatives

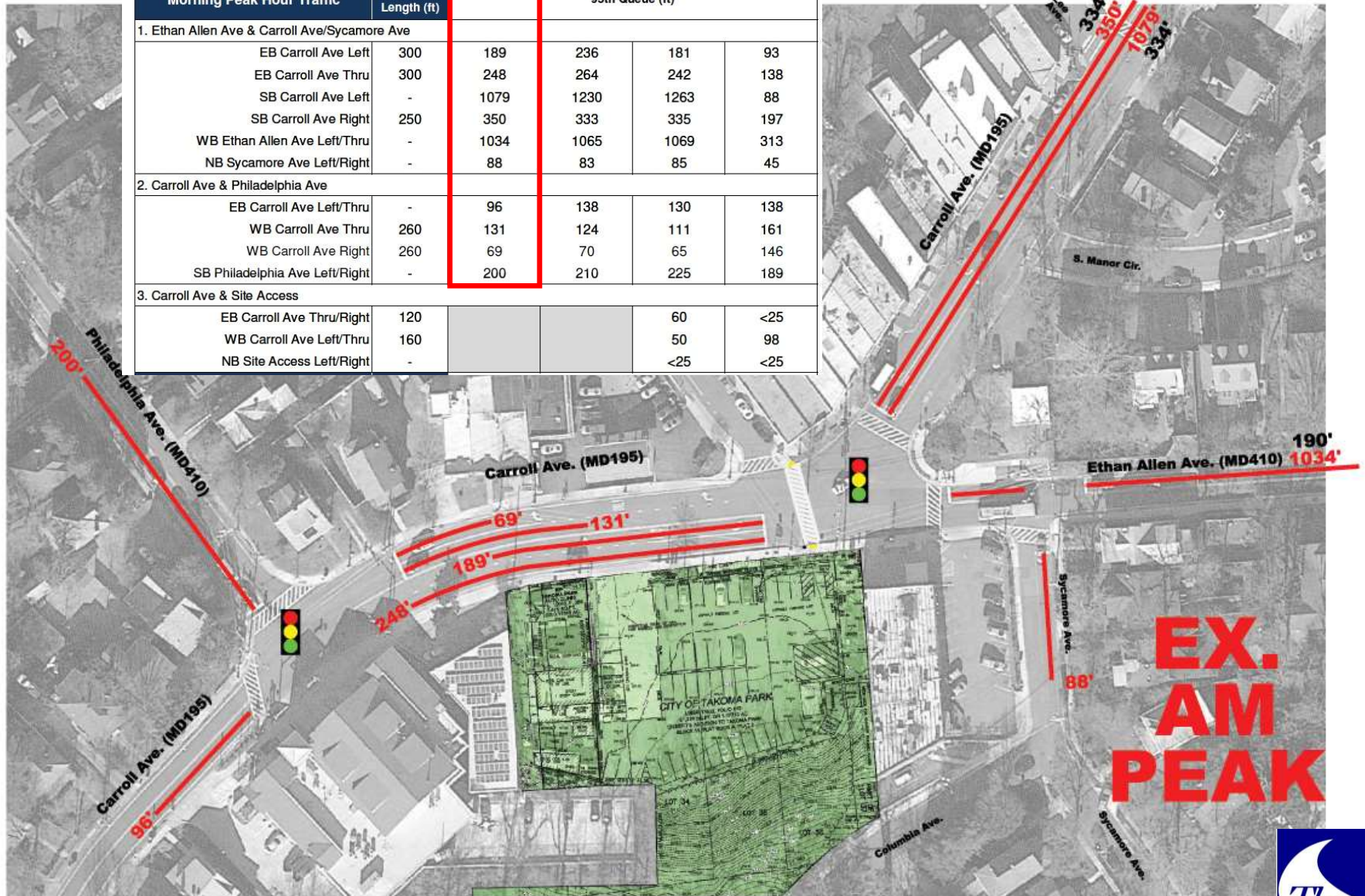


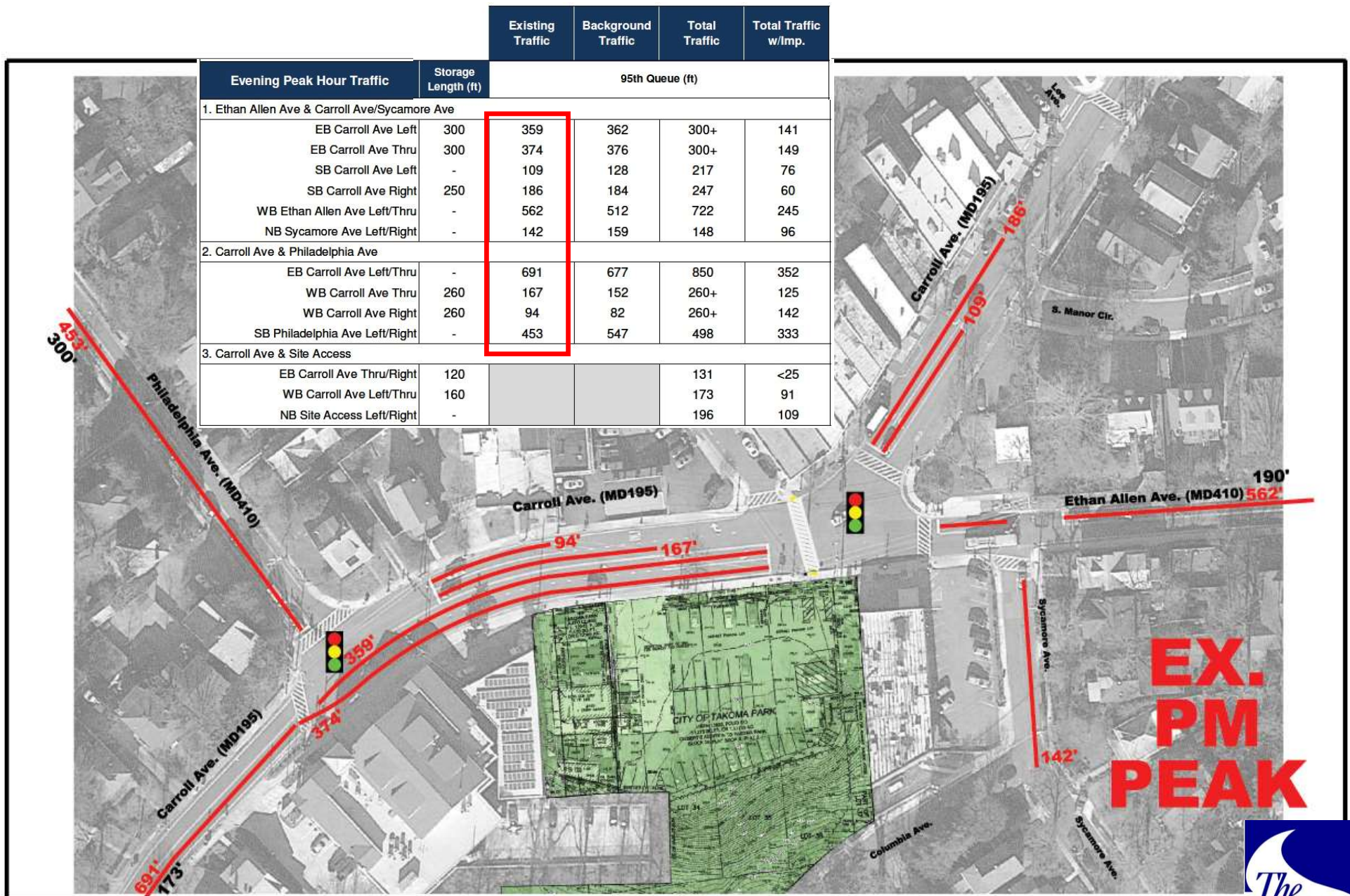
Intersection Improvement



Queuing Analysis

| <u>Queuing Analysis</u> | | Existing Traffic | Background Traffic | Total Traffic | Total Traffic w/Imp. |
|---|---------------------|------------------|--------------------|---------------|----------------------|
| Morning Peak Hour Traffic | Storage Length (ft) | 95th Queue (ft) | | | |
| 1. Ethan Allen Ave & Carroll Ave/Sycamore Ave | | | | | |
| EB Carroll Ave Left | 300 | 189 | 236 | 181 | 93 |
| EB Carroll Ave Thru | 300 | 248 | 264 | 242 | 138 |
| SB Carroll Ave Left | - | 1079 | 1230 | 1263 | 88 |
| SB Carroll Ave Right | 250 | 350 | 333 | 335 | 197 |
| WB Ethan Allen Ave Left/Thru | - | 1034 | 1065 | 1069 | 313 |
| NB Sycamore Ave Left/Right | - | 88 | 83 | 85 | 45 |
| 2. Carroll Ave & Philadelphia Ave | | | | | |
| EB Carroll Ave Left/Thru | - | 96 | 138 | 130 | 138 |
| WB Carroll Ave Thru | 260 | 131 | 124 | 111 | 161 |
| WB Carroll Ave Right | 260 | 69 | 70 | 65 | 146 |
| SB Philadelphia Ave Left/Right | - | 200 | 210 | 225 | 189 |
| 3. Carroll Ave & Site Access | | | | | |
| EB Carroll Ave Thru/Right | 120 | | | 60 | <25 |
| WB Carroll Ave Left/Thru | 160 | | | 50 | 98 |
| NB Site Access Left/Right | - | | | <25 | <25 |



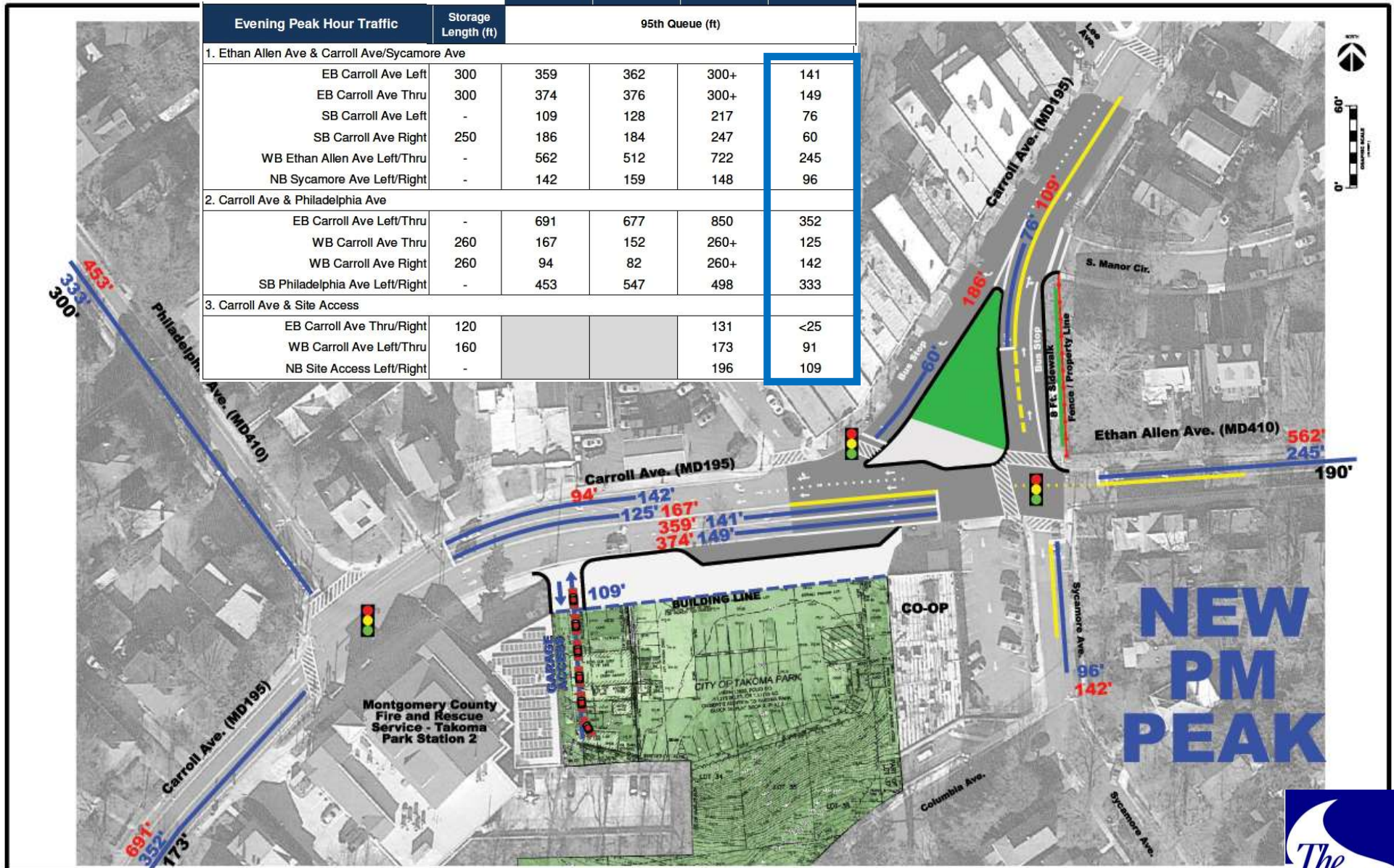


| | | Existing Traffic | Background Traffic | Total Traffic | Total Traffic w/Imp. |
|---|---------------------|------------------|--------------------|---------------|----------------------|
| Evening Peak Hour Traffic | Storage Length (ft) | 95th Queue (ft) | | | |
| 1. Ethan Allen Ave & Carroll Ave/Sycamore Ave | | | | | |
| EB Carroll Ave Left | 300 | 359 | 362 | 300+ | 141 |
| EB Carroll Ave Thru | 300 | 374 | 376 | 300+ | 149 |
| SB Carroll Ave Left | - | 109 | 128 | 217 | 76 |
| SB Carroll Ave Right | 250 | 186 | 184 | 247 | 60 |
| WB Ethan Allen Ave Left/Thru | - | 562 | 512 | 722 | 245 |
| NB Sycamore Ave Left/Right | - | 142 | 159 | 148 | 96 |
| 2. Carroll Ave & Philadelphia Ave | | | | | |
| EB Carroll Ave Left/Thru | - | 691 | 677 | 850 | 352 |
| WB Carroll Ave Thru | 260 | 167 | 152 | 260+ | 125 |
| WB Carroll Ave Right | 260 | 94 | 82 | 260+ | 142 |
| SB Philadelphia Ave Left/Right | - | 453 | 547 | 498 | 333 |
| 3. Carroll Ave & Site Access | | | | | |
| EB Carroll Ave Thru/Right | 120 | | | 131 | <25 |
| WB Carroll Ave Left/Thru | 160 | | | 173 | 91 |
| NB Site Access Left/Right | - | | | 196 | 109 |

| <u>Queuing Analysis</u> | | Existing Traffic | Background Traffic | Total Traffic | Total Traffic w/Imp. |
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| EB Carroll Ave Left | 300 | 359 | 362 | 300+ | 141 |
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| EB Carroll Ave Left/Thru | - | 691 | 677 | 850 | 352 |
| WB Carroll Ave Thru | 260 | 167 | 152 | 260+ | 125 |
| WB Carroll Ave Right | 260 | 94 | 82 | 260+ | 142 |
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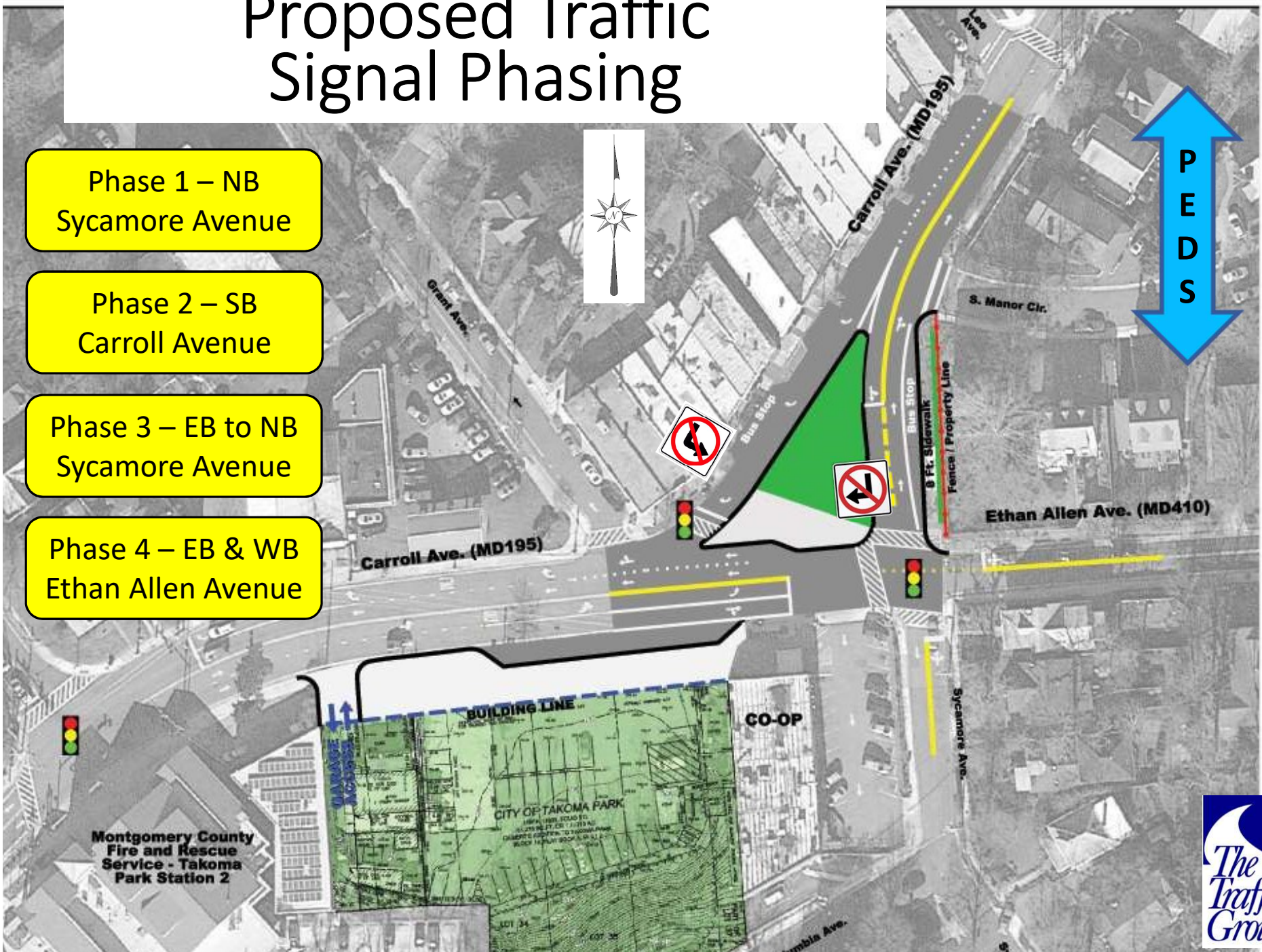
Proposed Traffic Signal Phasing

Phase 1 – NB
Sycamore Avenue

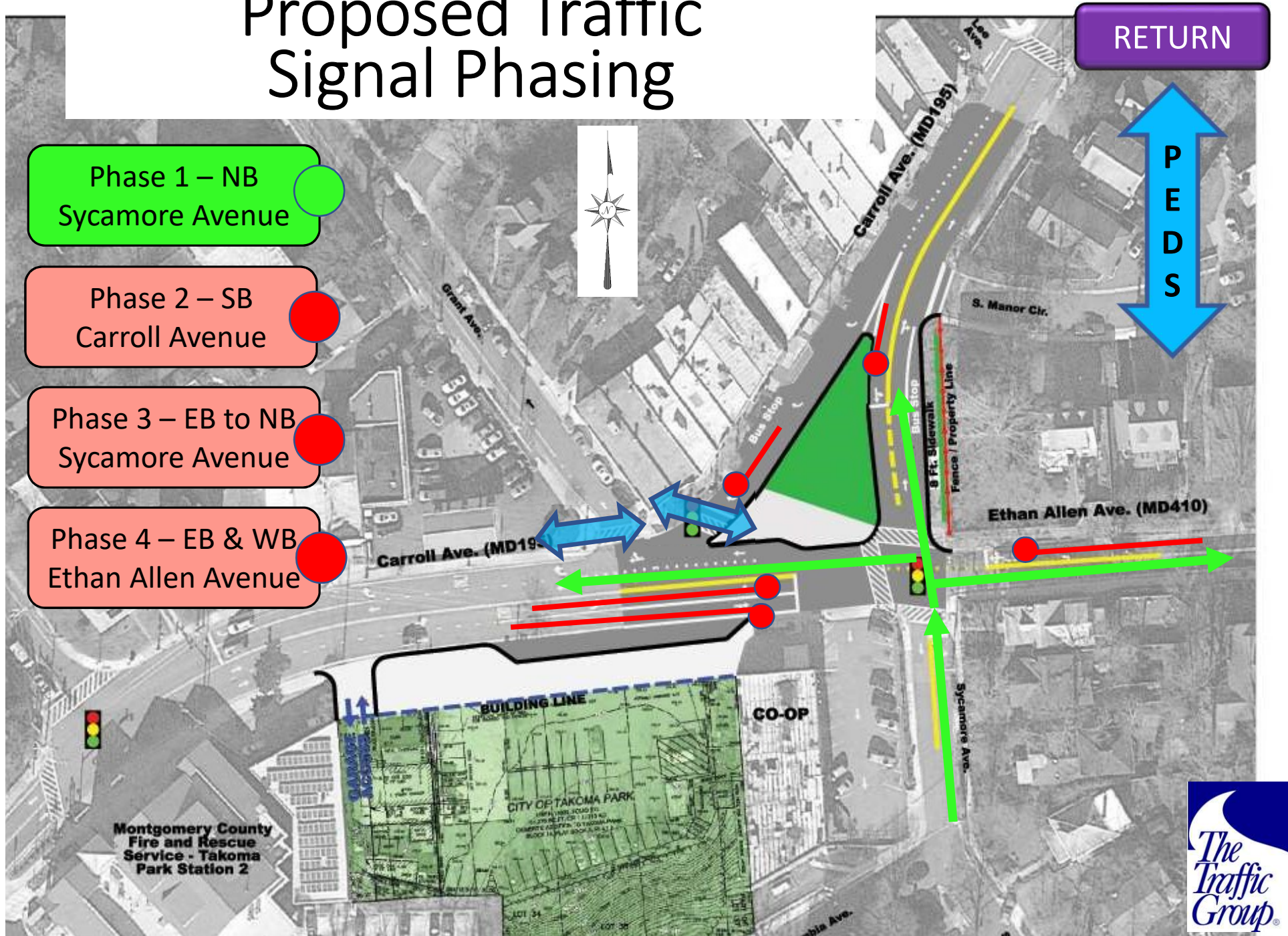
Phase 2 – SB
Carroll Avenue

Phase 3 – EB to NB
Sycamore Avenue

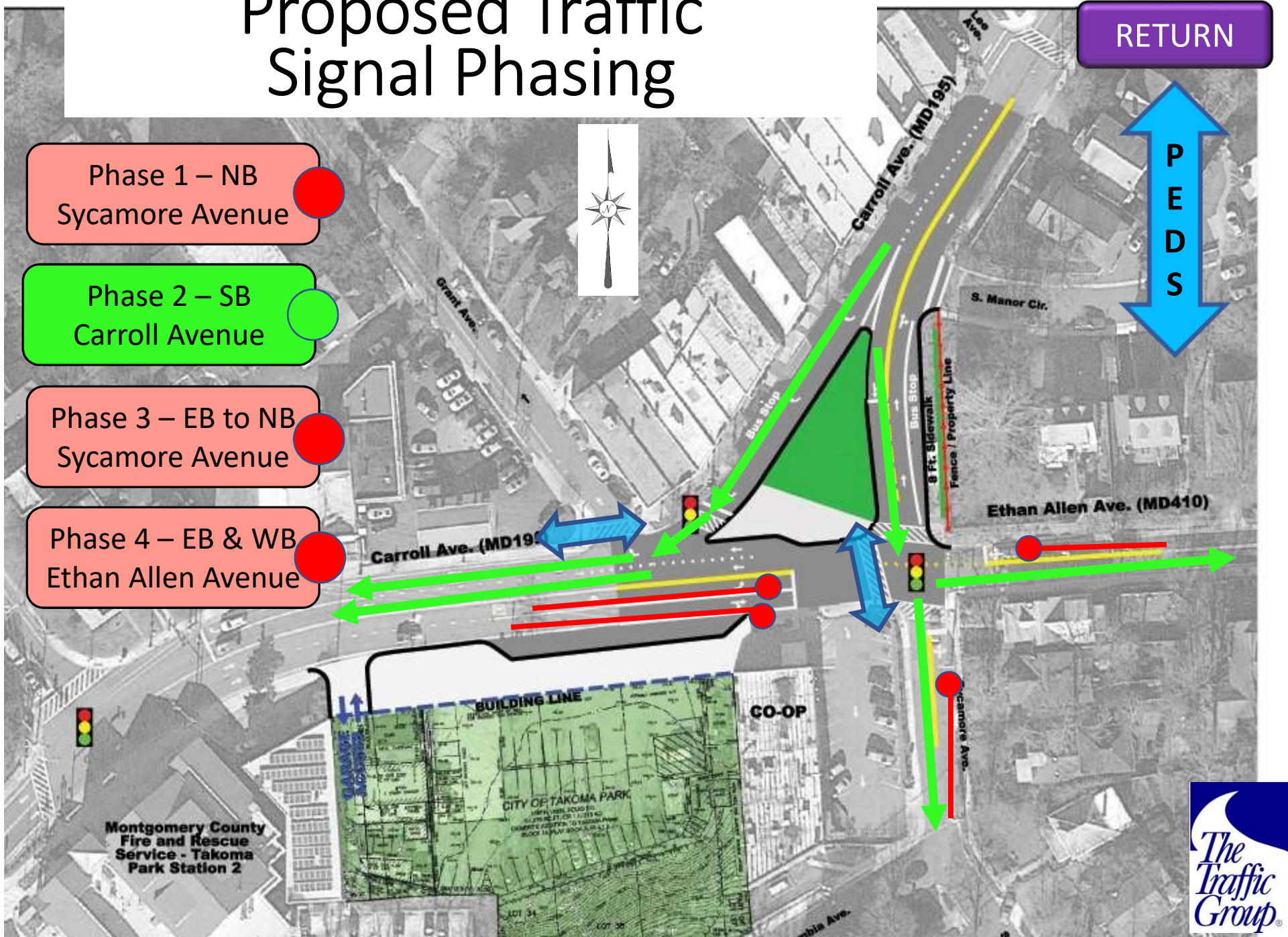
Phase 4 – EB & WB
Ethan Allen Avenue



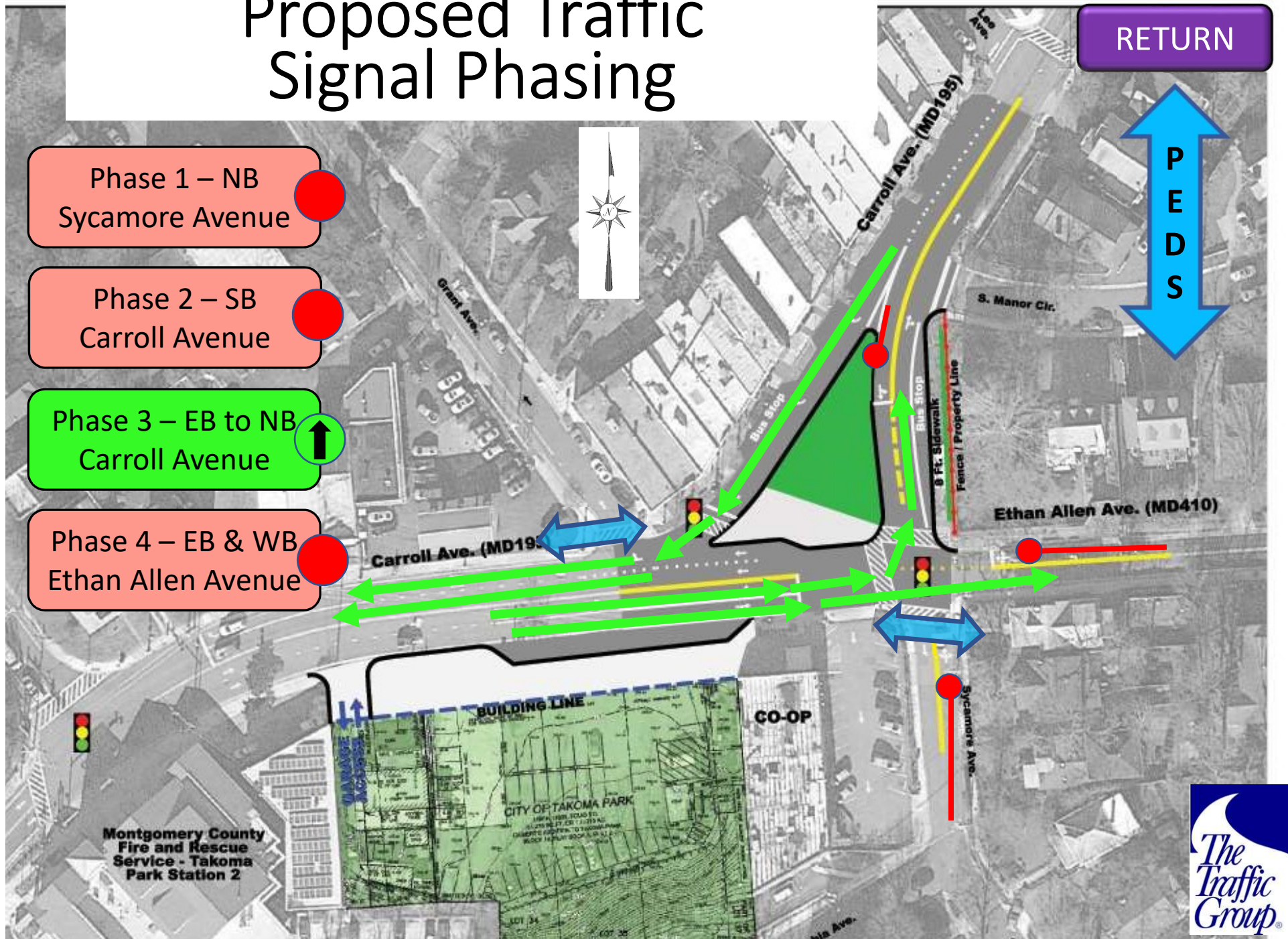
Proposed Traffic Signal Phasing



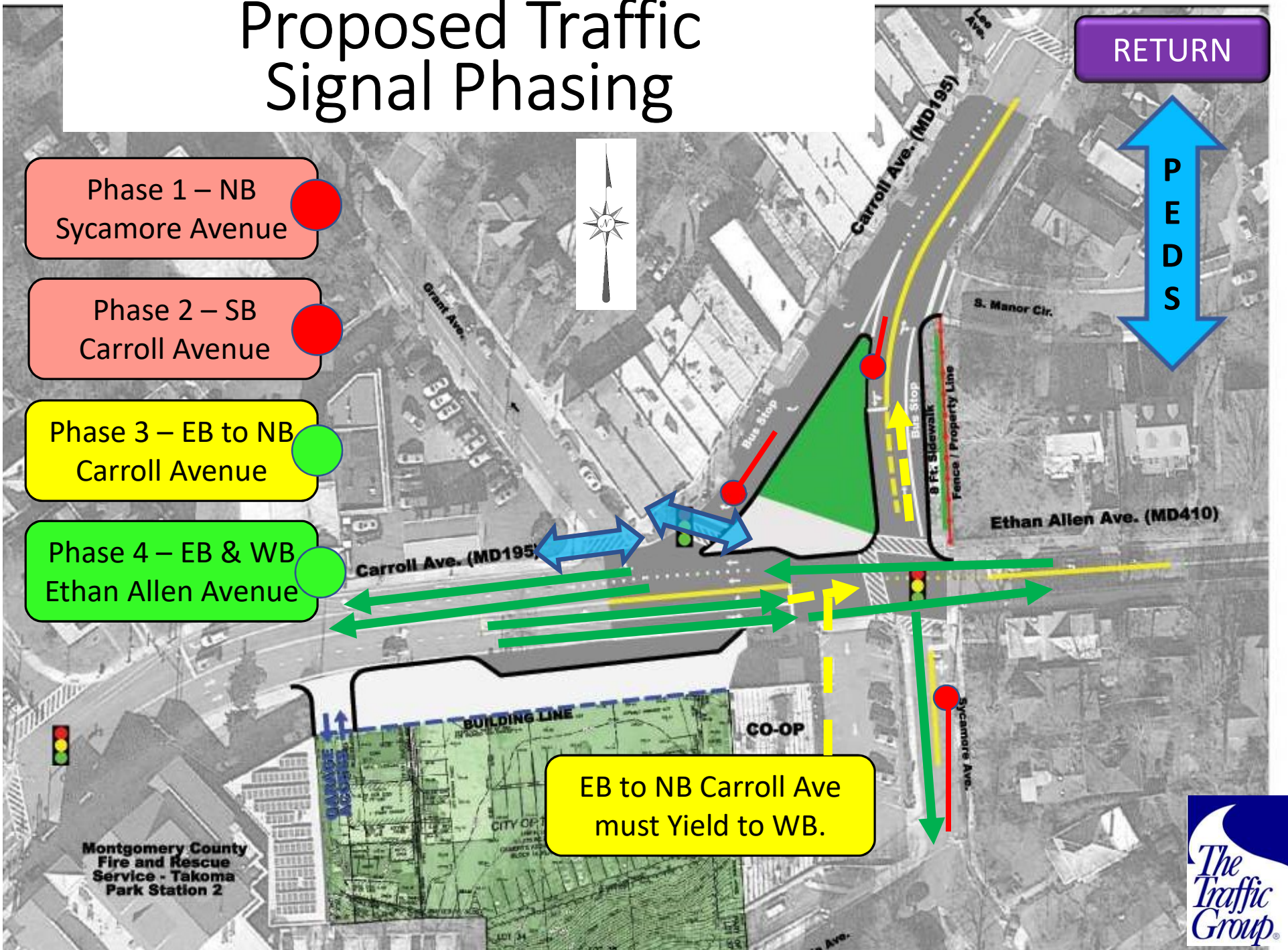
Proposed Traffic Signal Phasing



Proposed Traffic Signal Phasing



Proposed Traffic Signal Phasing



Existing Truck Deliveries

Existing Peak Hour Truck Delivery Observations - WED 1/31/18

AM Hours 6:30 AM thru 9:30 AM

| Truck Size | Time In | Time Out | Duration |
|-------------------|---------|----------|----------|
| Single Unit 30/40 | 6:33 AM | 6:51 AM | 18 Min |
| Single Unit 30/40 | 6:45 AM | 7:13 AM | 28 Min |
| Single Unit 30/40 | 7:21 AM | 7:39 AM | 18 Min |
| Single Unit 30/40 | 8:29 AM | 8:32 AM | 3 Min |
| Single Unit 30/40 | 8:51 AM | 9:04 AM | 13 Min |
| WB-67 Large Semi | 8:58 AM | 9:30 AM | 32 Min |

Arrival during Peak Hour:
7:30 AM thru 8:30 AM (2
Vehs = 10.5 Min Average

| | |
|-----------------|-----------|
| Total 6 Trucks: | 112 Min. |
| Average Time: | 18.7 Min. |

PM Hours 4:00 PM thru 7:00 PM

| Truck Size | Time In | Time Out | Duration |
|-------------------|--------------|----------|----------|
| Single Unit 30/40 | * 3:30:00 PM | 3:31 PM | * 16 Min |

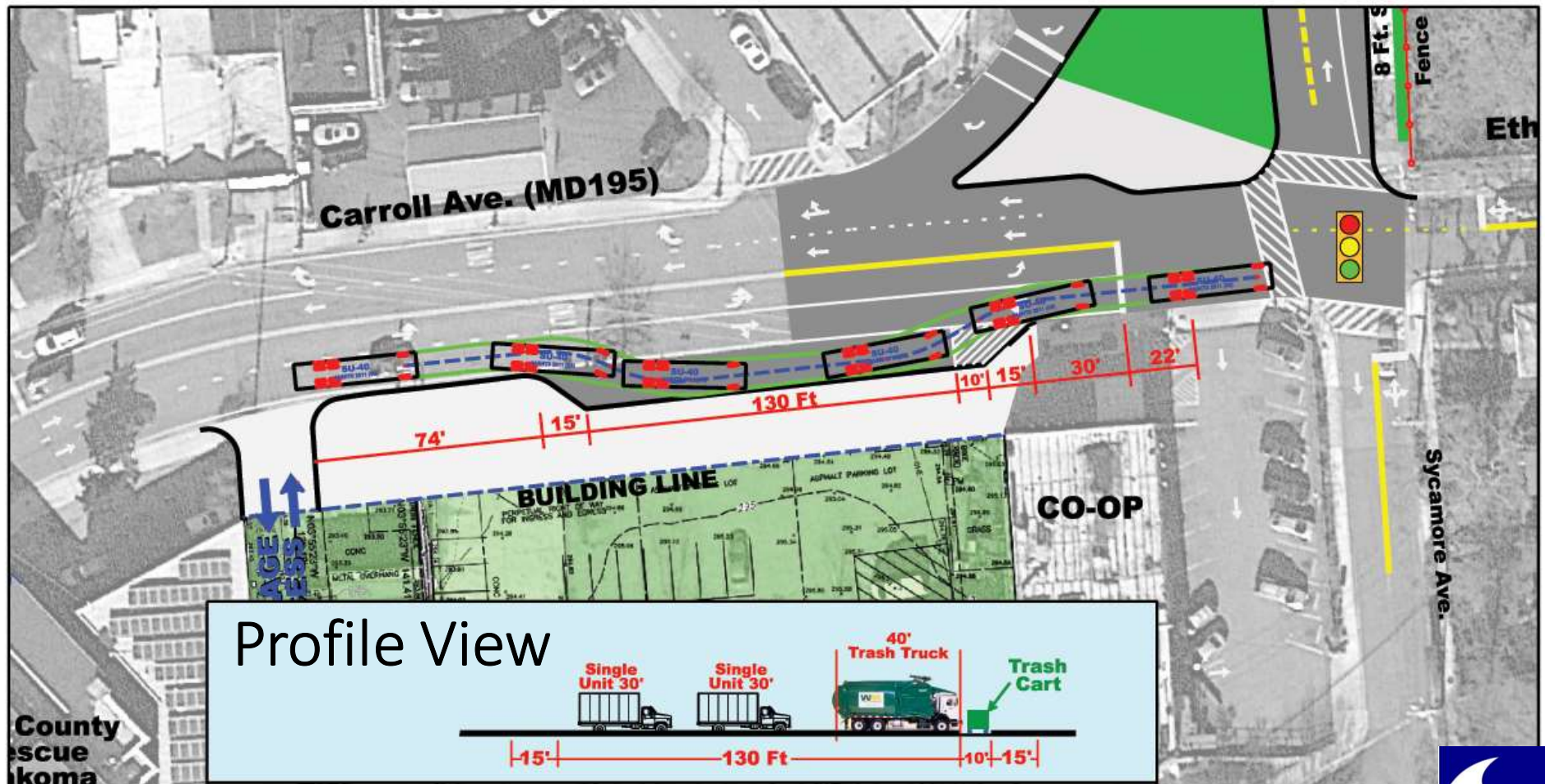
Arrival during Peak Hour: No
Delivery Vehicles Observed
during PM Peak Hour: 5:15
PM thru 6:15 PM.

| | |
|----------------|---------|
| Total 1 Truck: | 16 Min. |
| Average Time: | 16 Min. |

* Delivery truck onsite at beginning of video count, 16 min. average delivery time calculated by averaging the Single Unit 30/40 trucks from AM Observations.



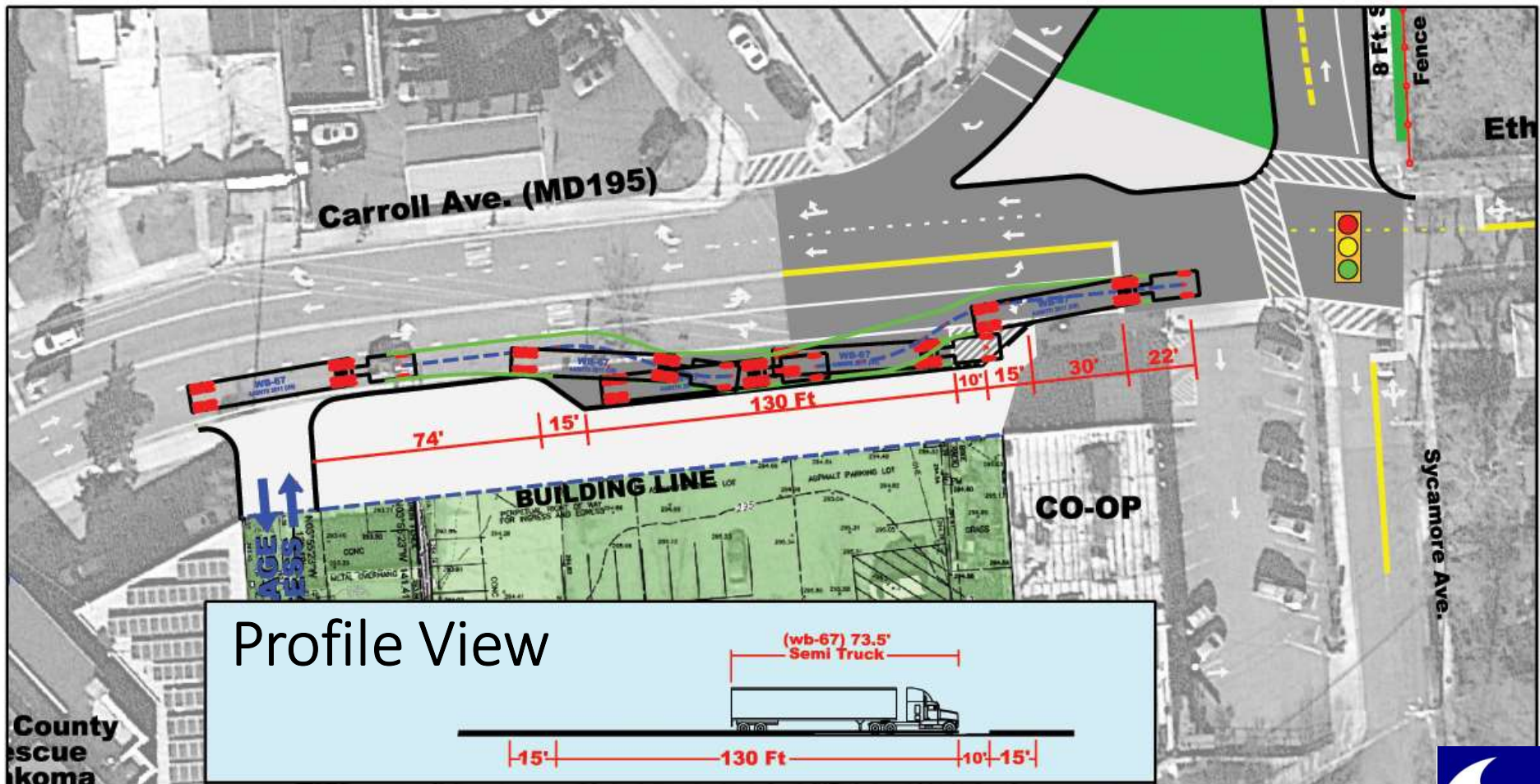
Loading Area



Loading Area



Loading Area



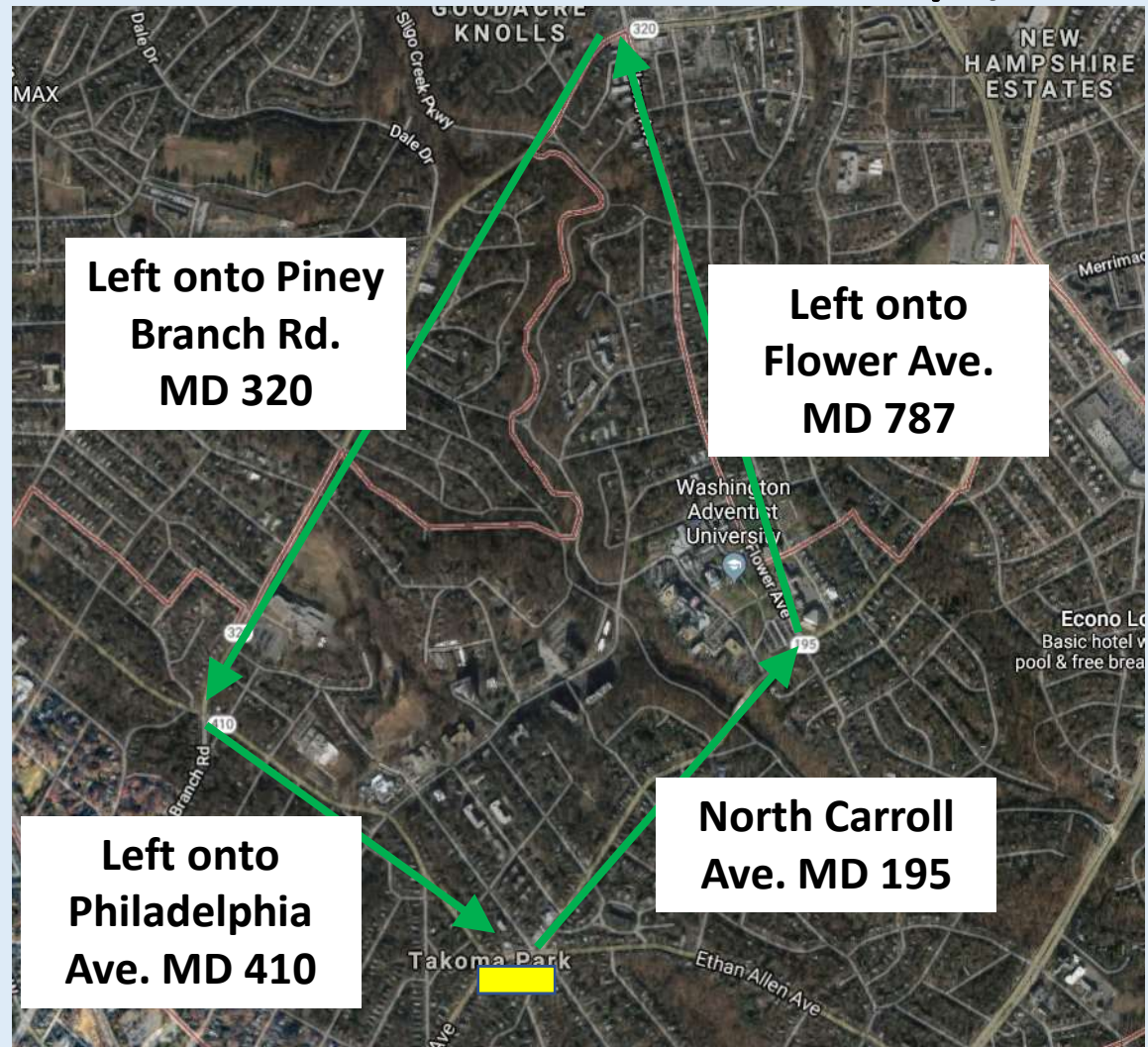
EXAMPLE



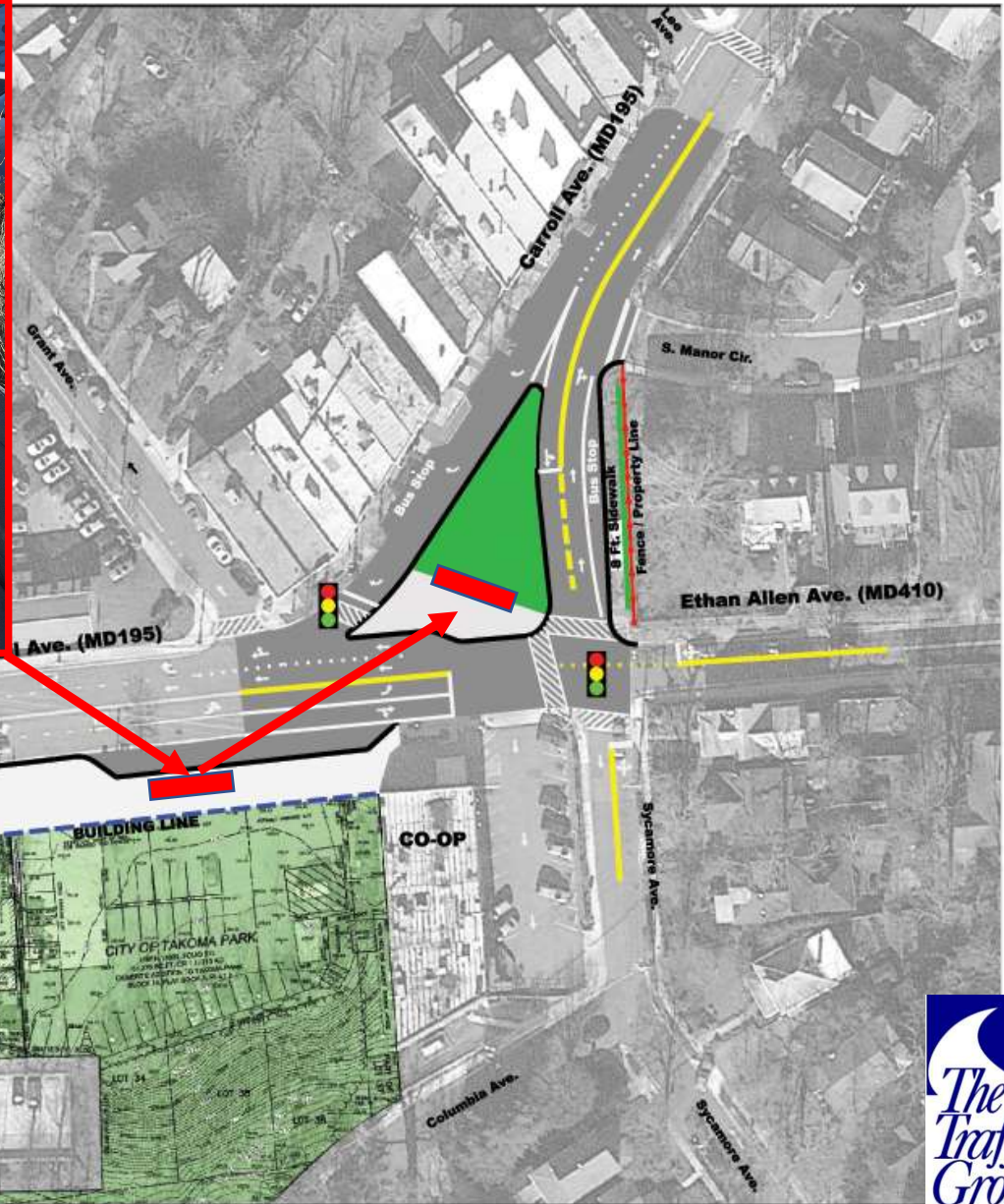
Truck Handout

13 min.
3.5 miles

(Please Circle Back - Map)

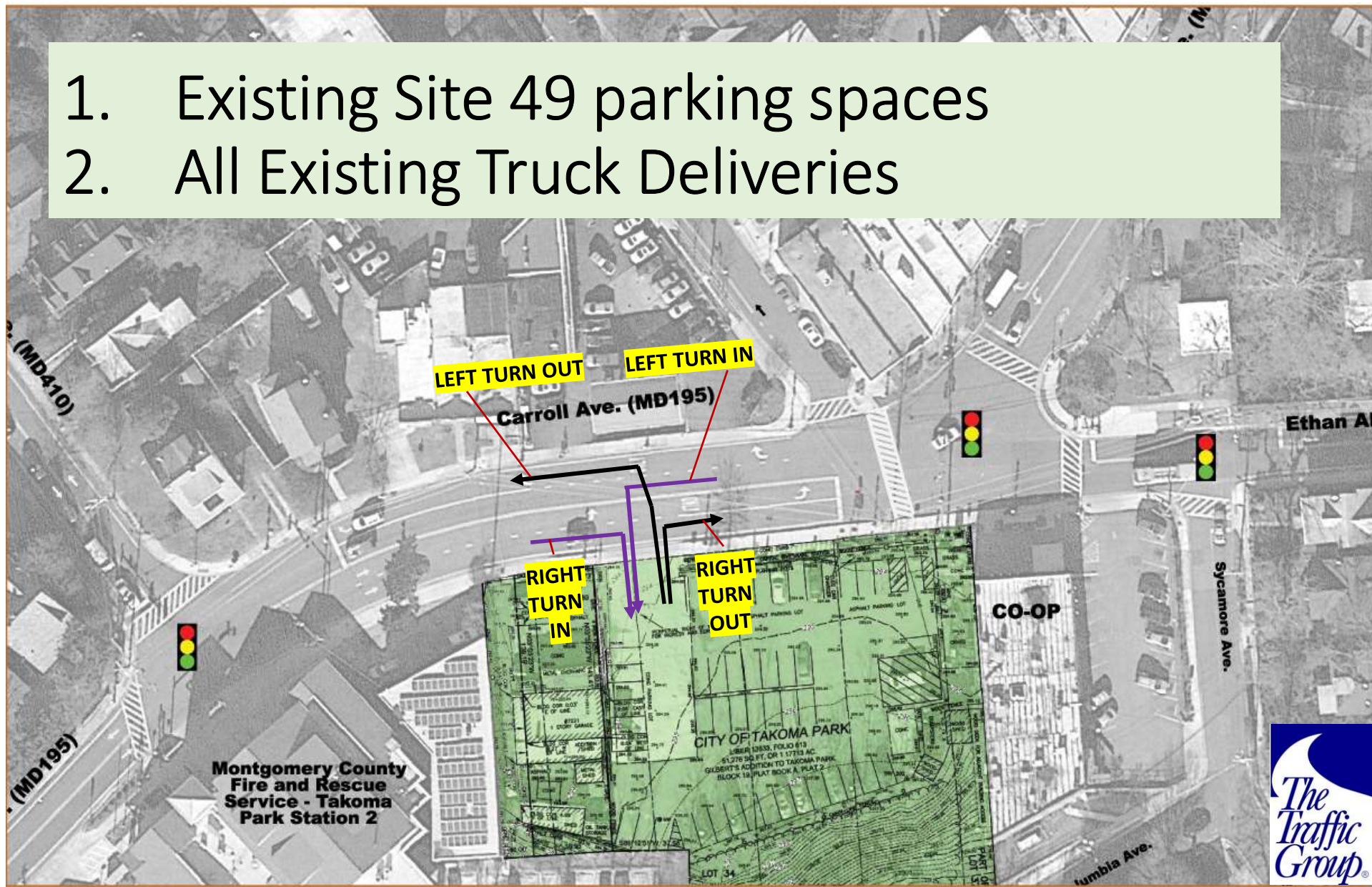


Capital Bike Share Station Re-location



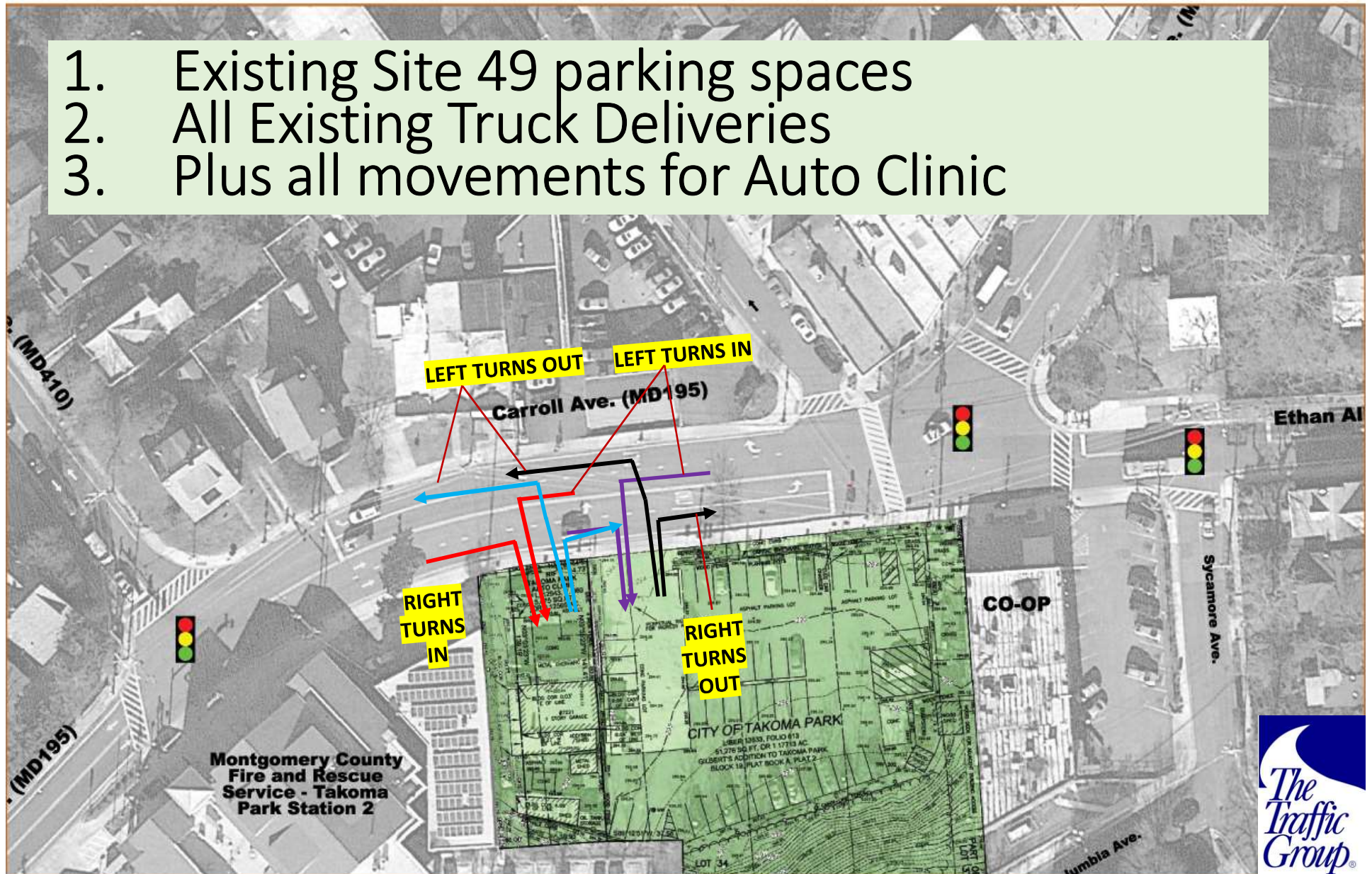
Existing Site Access

1. Existing Site 49 parking spaces
2. All Existing Truck Deliveries



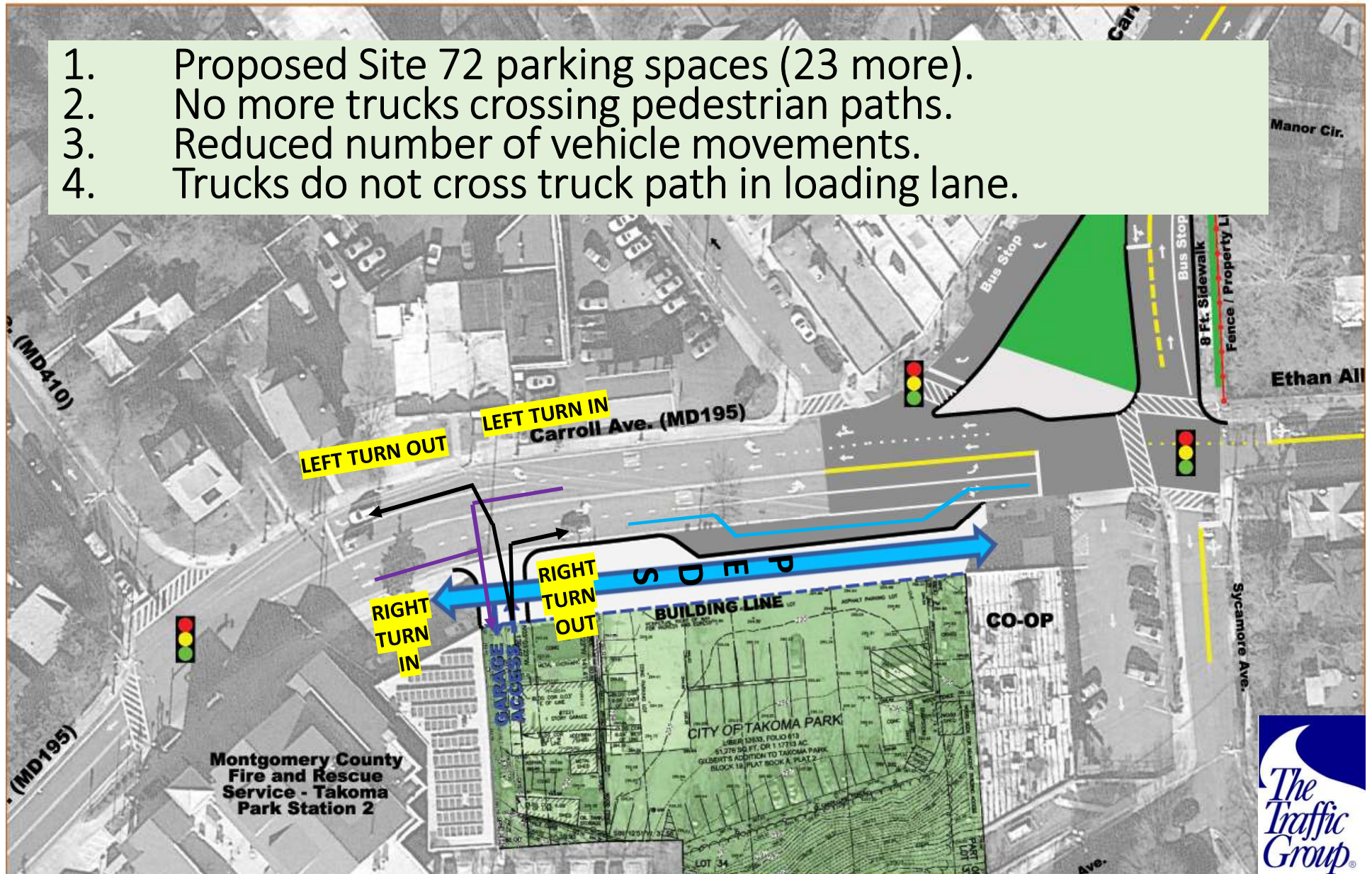
Proposed Site Access

1. Existing Site 49 parking spaces
2. All Existing Truck Deliveries
3. Plus all movements for Auto Clinic



Proposed Site Access

1. Proposed Site 72 parking spaces (23 more).
2. No more trucks crossing pedestrian paths.
3. Reduced number of vehicle movements.
4. Trucks do not cross truck path in loading lane.



Bus Stop Locations

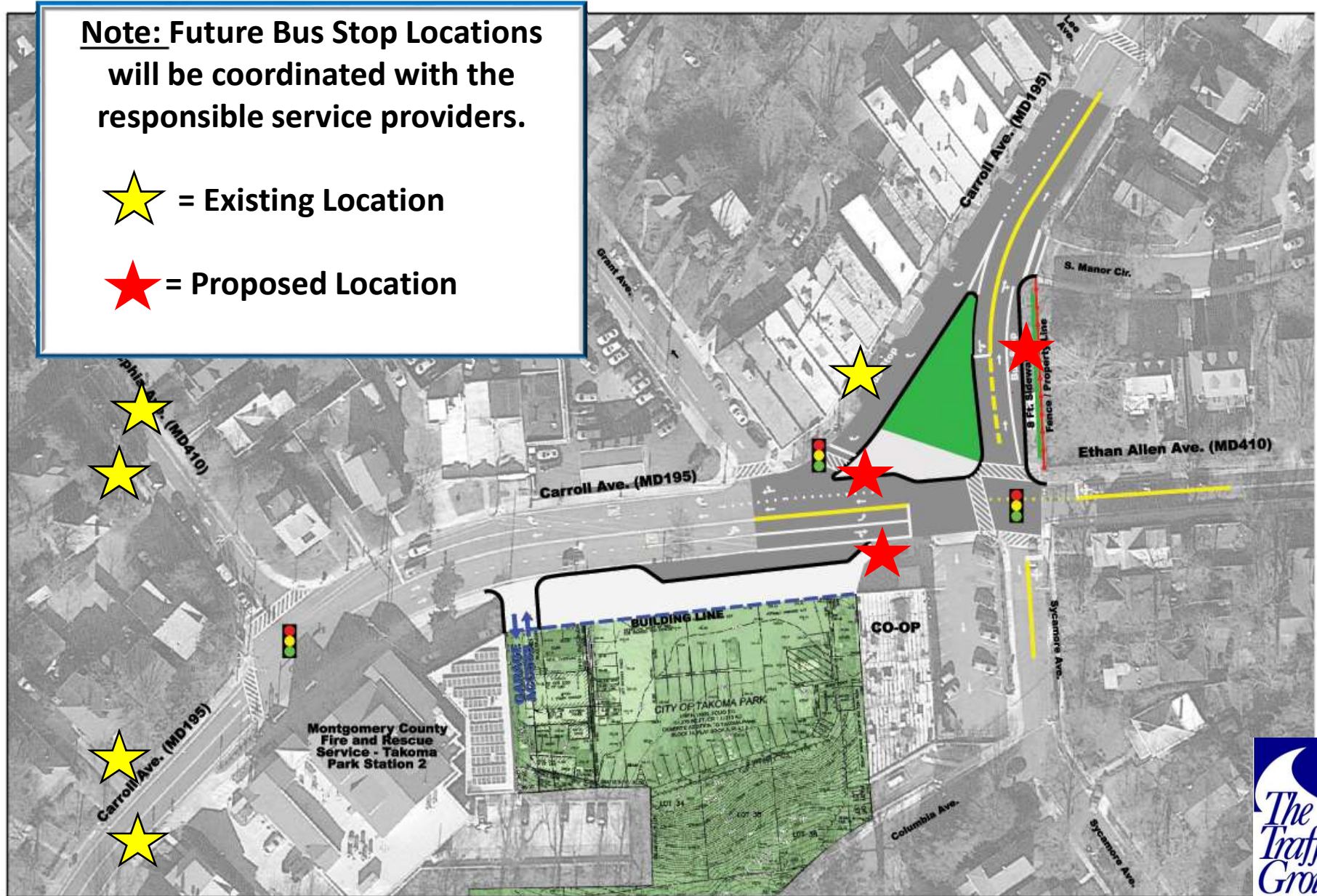


Bus Stop Re-locations

Note: Future Bus Stop Locations will be coordinated with the responsible service providers.

 = Existing Location

 = Proposed Location





Questions