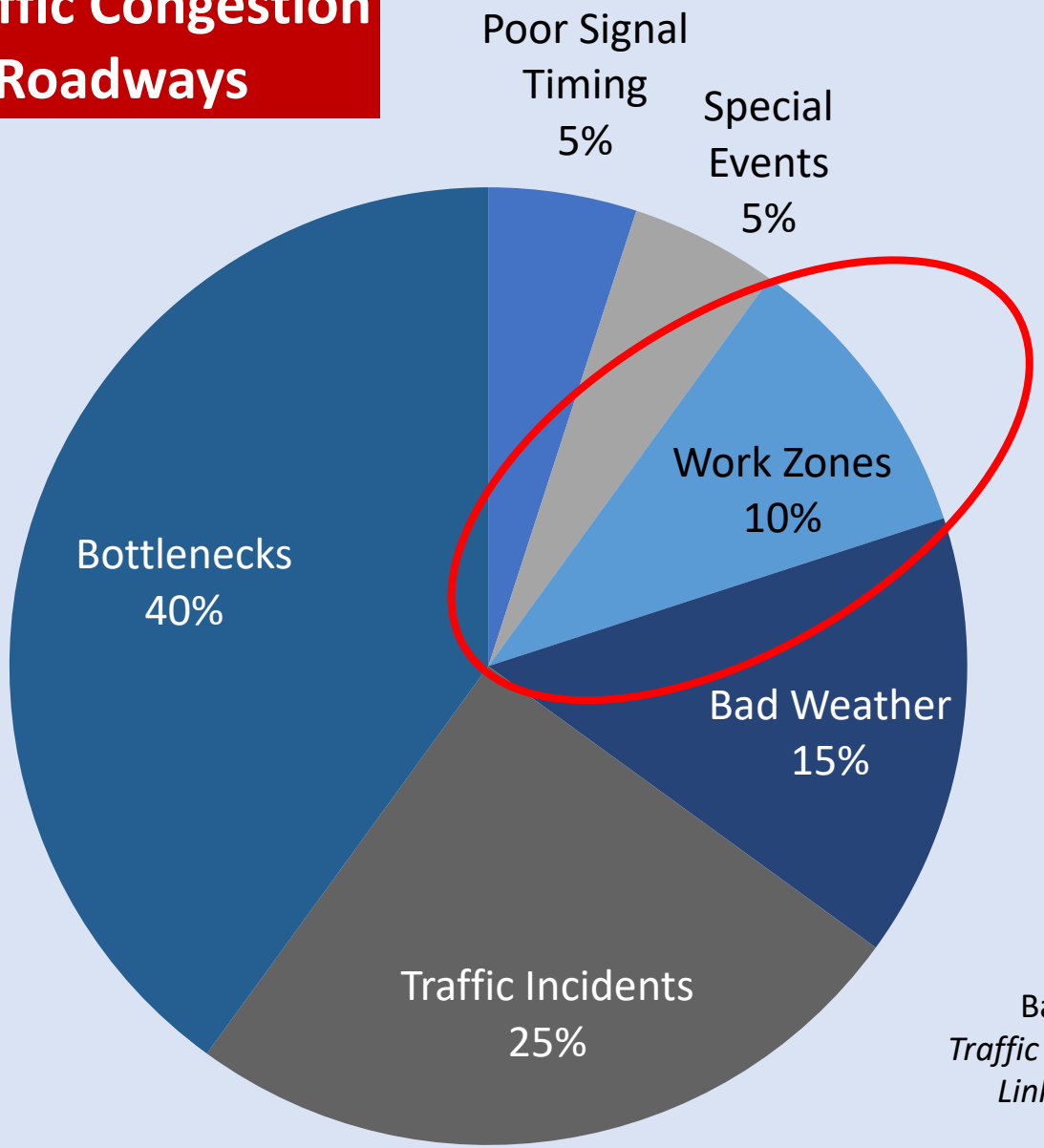
Traffic Signal Operations within Arterial Roadway Construction Projects

Peter J. Yauch, P.E., PTOE – Albeck Gerken, Inc.

Source: Tampa Bay Times

Causes of Traffic Congestion Arterial Roadways



Based on FHWA Report:
Traffic Congestion and Reliability: Linking Solutions to Problems
July 2004

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Source: Tampa Bay Times

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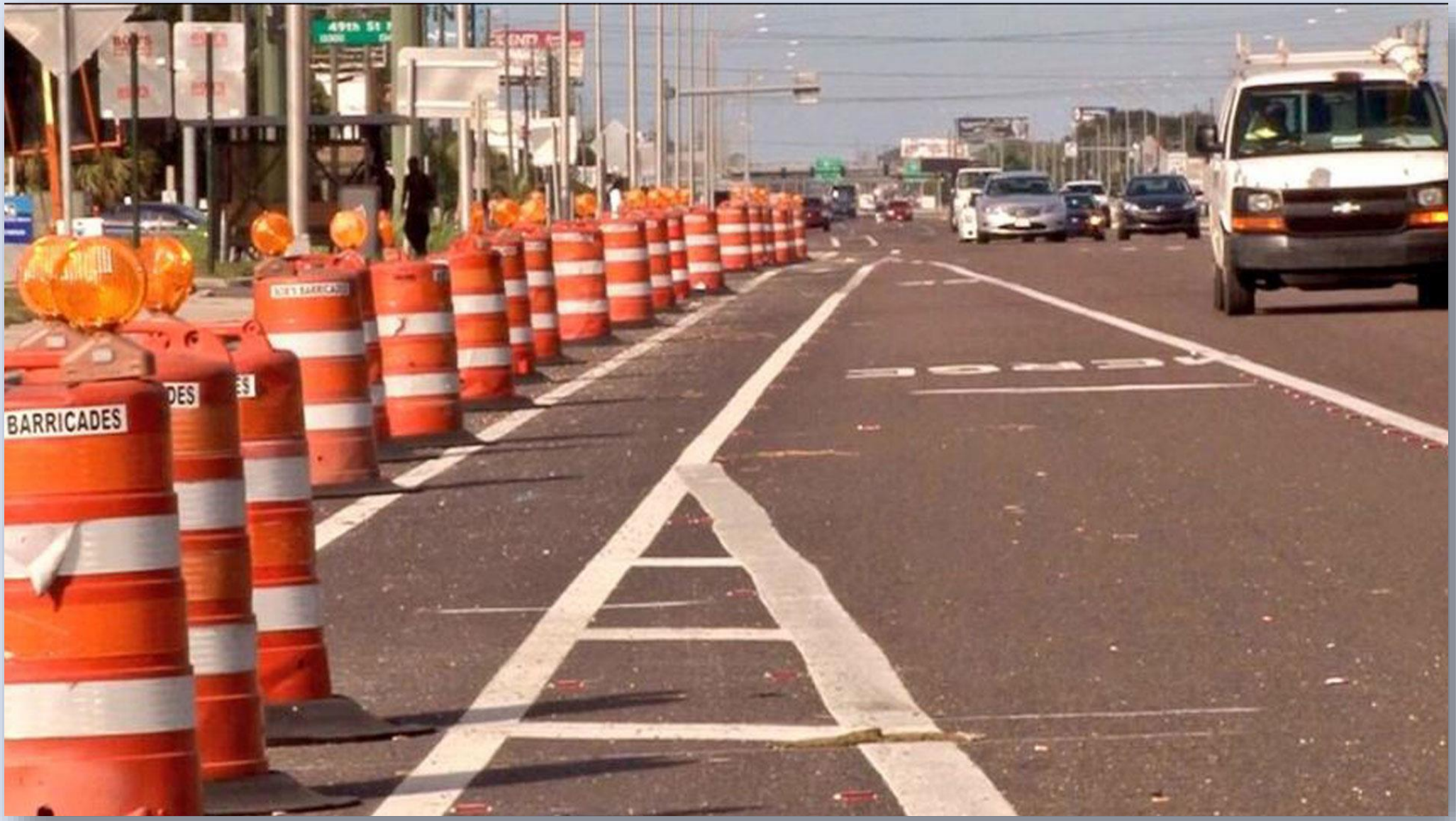

Source: Tampa Bay Times

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Expeditious: marked by or acting with prompt efficiency

Description

Maintain traffic within the limits of the project for the duration of the construction period…

Provide any other special requirements for safe and expeditious movement of traffic specified in the Plans.

MOT includes all facilities, devices and operations as required for safety and convenience of the public within the work zone.

Convenience: freedom from discomfort

ol.

102-5.3 Number of Traffic Lanes: Maintain one lane of traffic in each direction. Maintain two lanes of traffic in each direction at existing four (or more) lane cross roads, where necessary to avoid undue traffic congestion.

Undue: exceeding propriety or fitness, excessive

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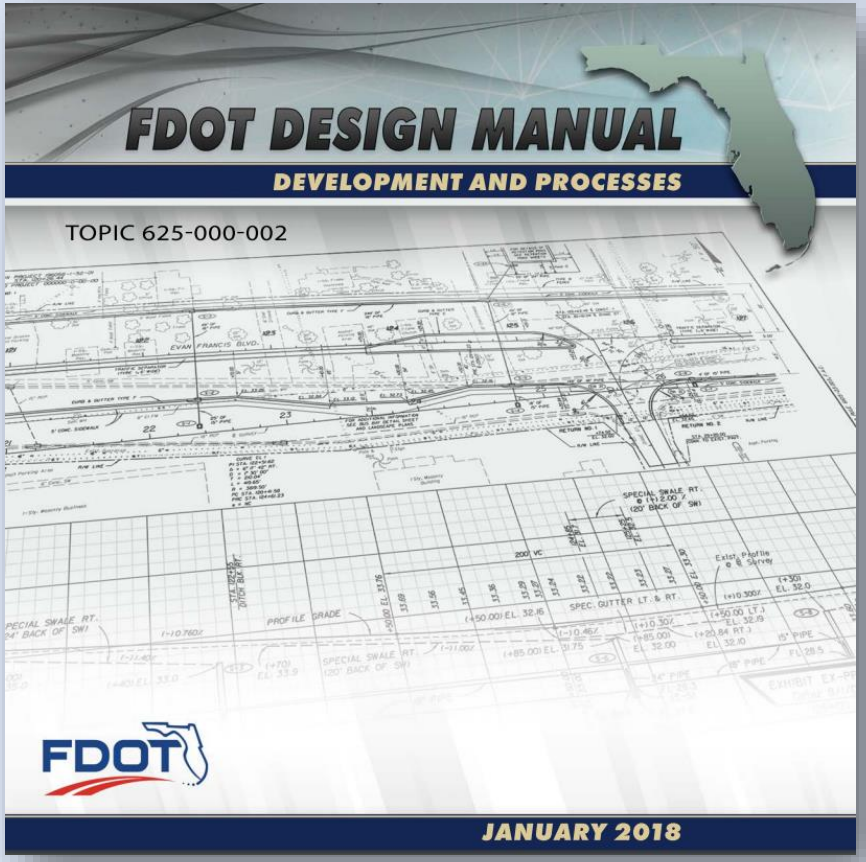
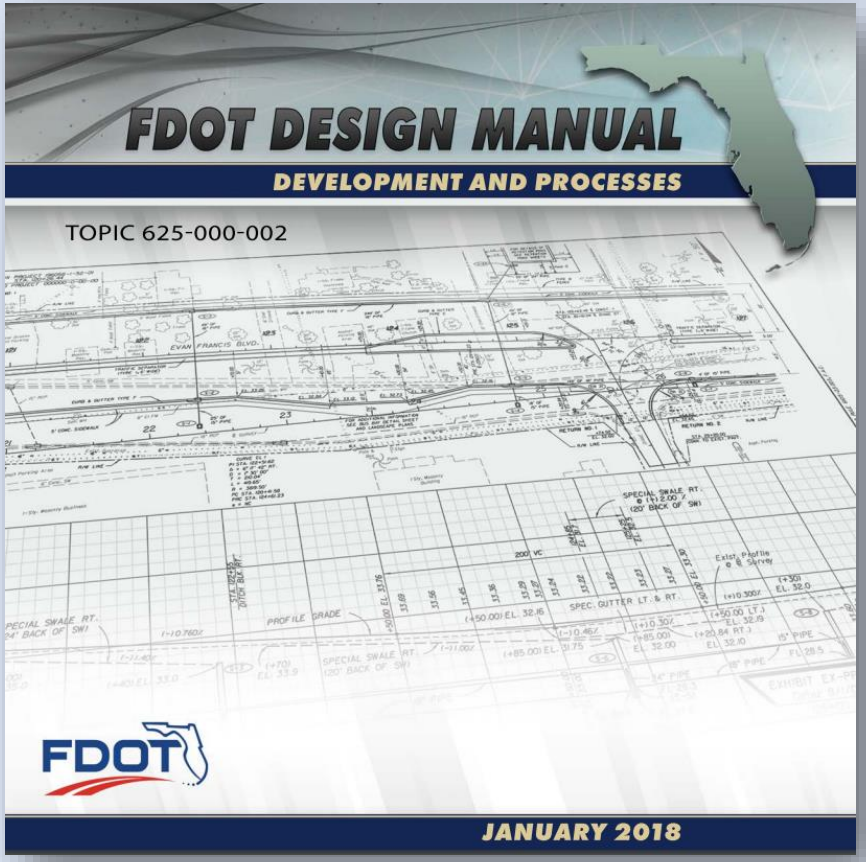


240 Transportation Management Plan

A Transportation Management Plan (TMP) is required for minimizing activity-related traffic delay and crashes.

All TMPs share the common goal of congestion relief during the construction phase by managing traffic flow and balancing traffic demand with highway capacity through the project area.

TMPs are required for significant projects which are defined as: (1) A project that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts. (2) All Interstate system projects within the boundaries of a designated Transportation Management Area (TMA) that occupy a location for more than three days with either intermittent or continuous lane closures.



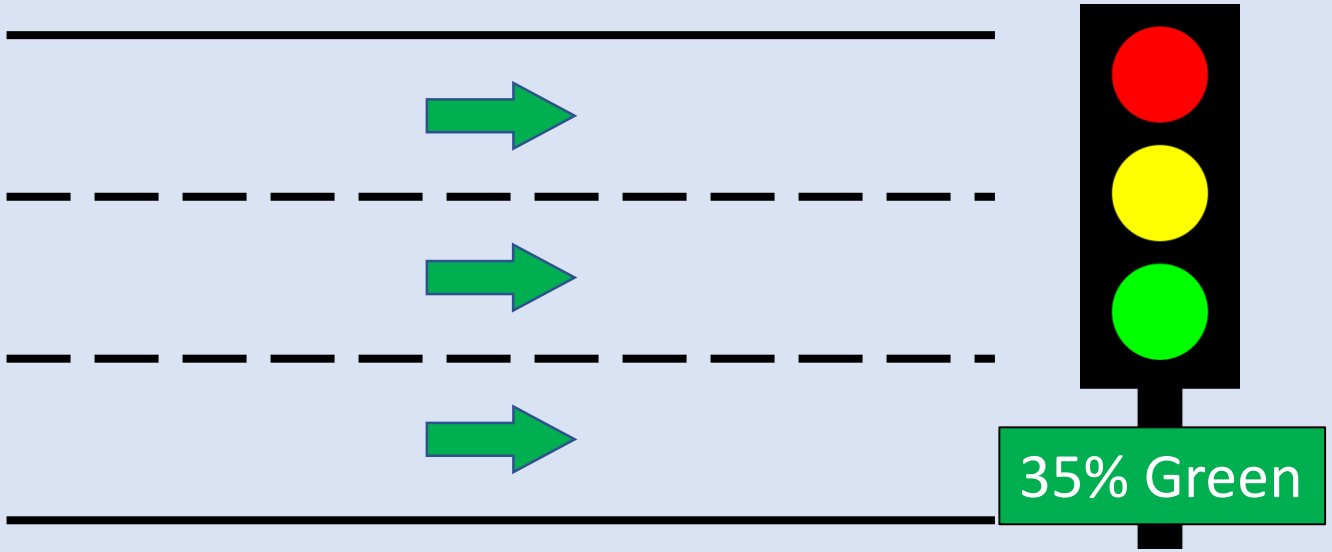
240.4 Temporary Traffic Control (TTC) Plan

(8) Signal timing for each phase, including temporary actuation, to maintain all existing actuated or traffic responsive mode signal operations for main and side street movements for the duration of the Contract (Check with Traffic Operations Engineer).

Adjust signal heads to maintain proper position when lane shifts are necessary and determine the need for temporary traffic detection. Coordinate required modifications to existing traffic signal operations with the District Traffic Operations Engineer and show all signal adjustments in the TTC plans.

Maintaining Lanes = Maintaining Capacity

Capacity of one traffic lane ≈ 1800 passenger cars per hour of green



3 lanes x 1800 vplphg x 35% =

1890 passenger cars per hour

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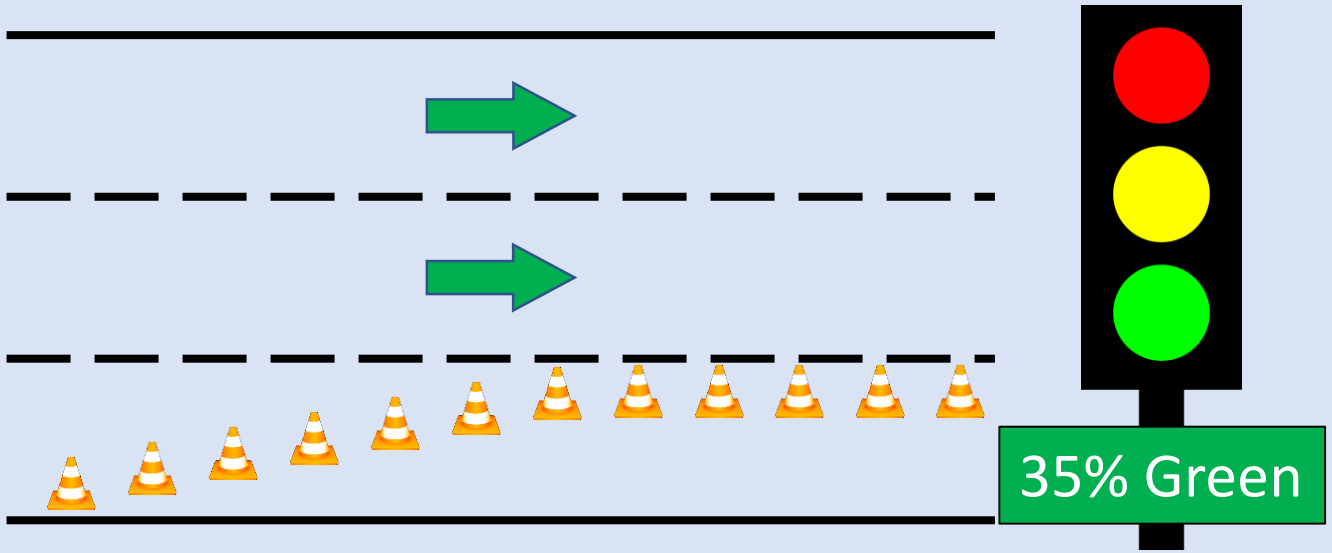
Maintaining Lanes = Maintaining Capacity

Capacity of one traffic lane ≈ 1800 passenger cars per hour of green



2 lanes x 1800 vplphg x 35% =

1260 passenger cars per hour

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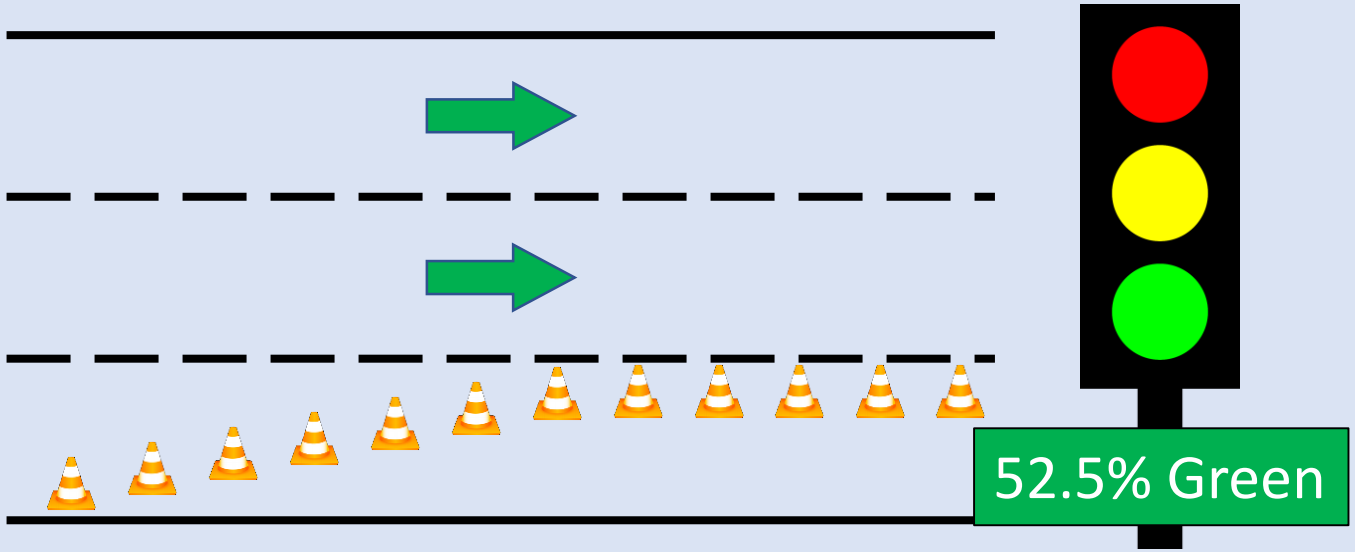
Maintaining Lanes = Maintaining Capacity

Capacity of one traffic lane ≈ 1800 passenger cars per hour of green



2 lanes x 1800 vplphg x 52.5% =

1890 passenger cars per hour

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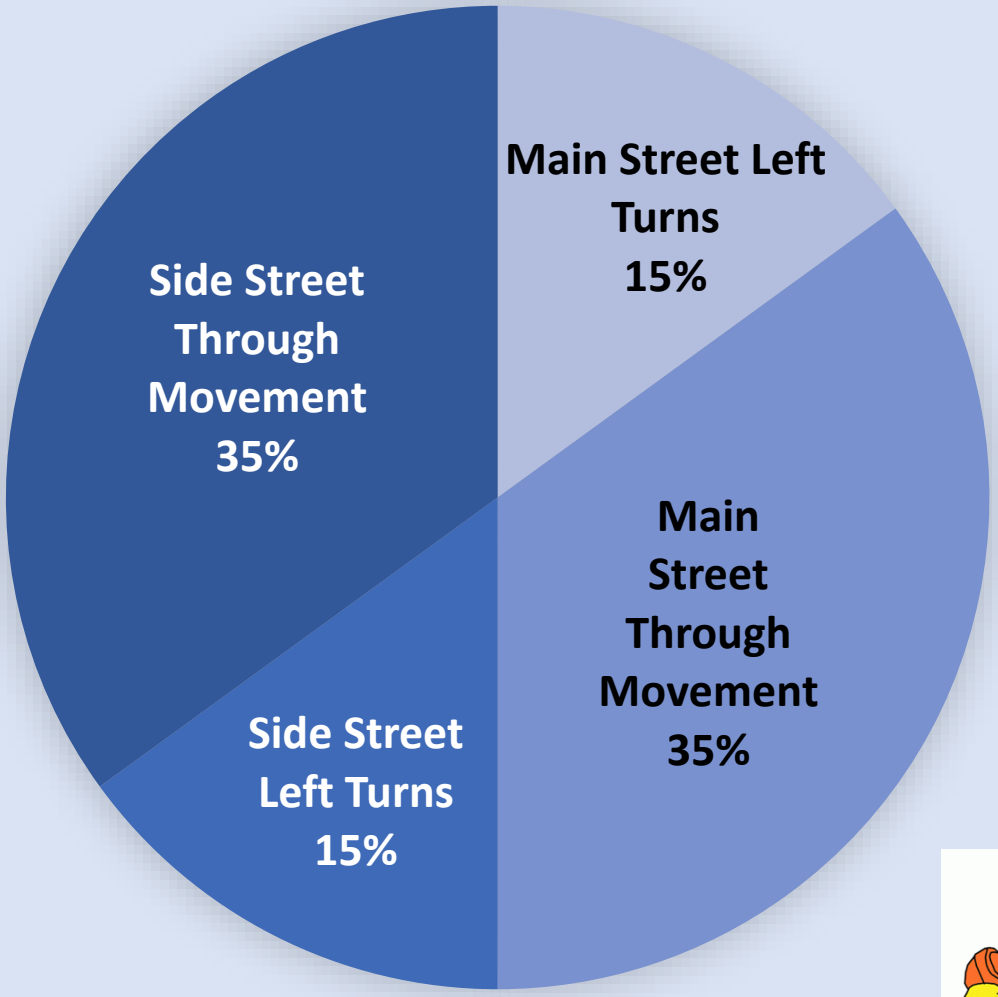
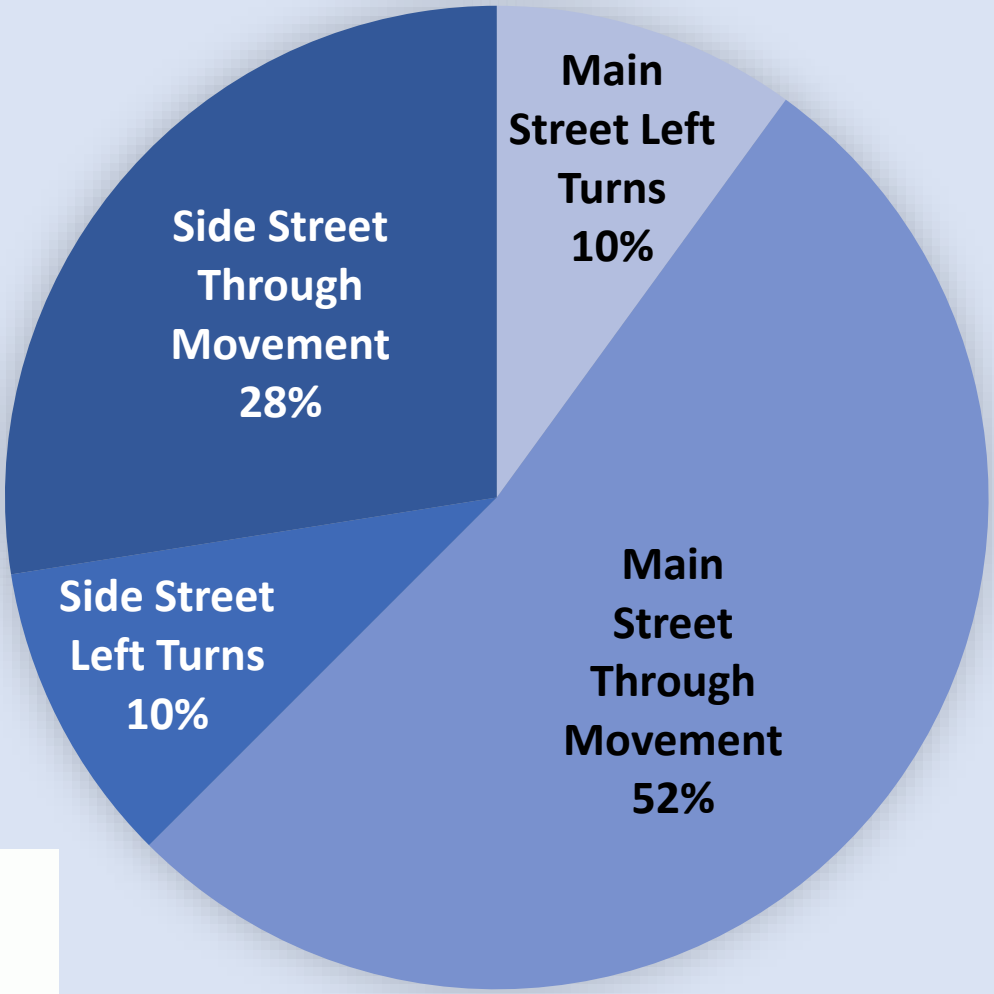
Percent of Signal Cycle



Percent of Signal Cycle



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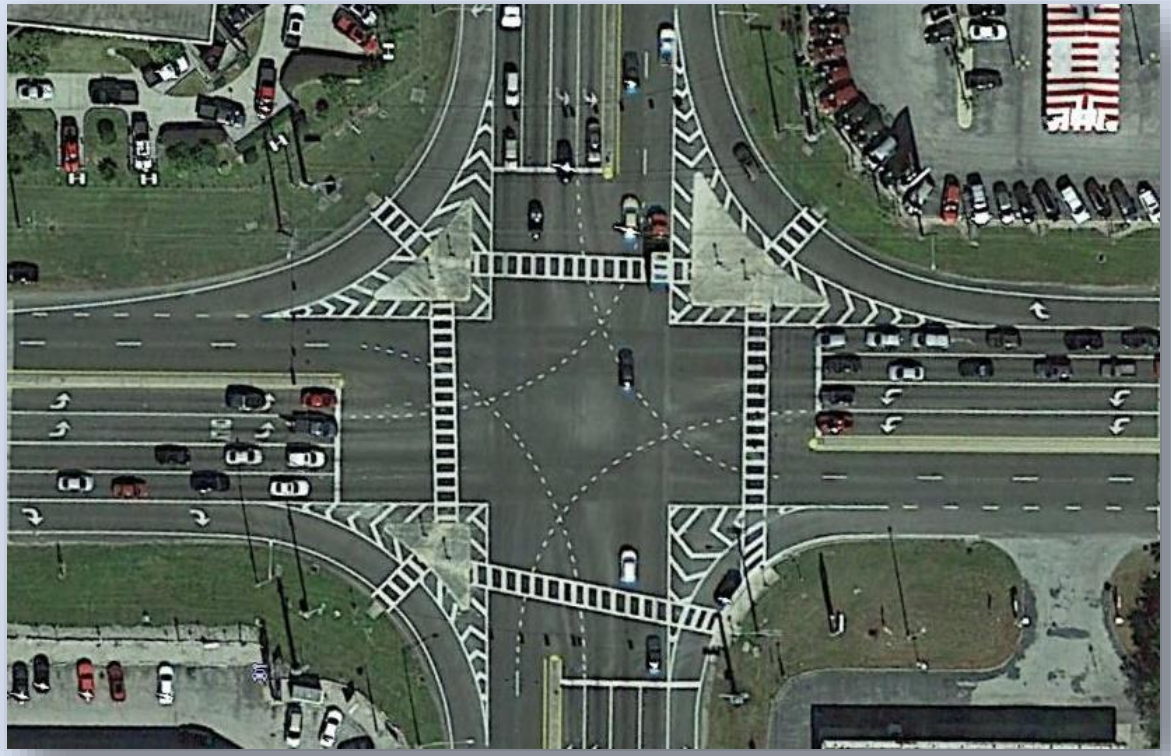
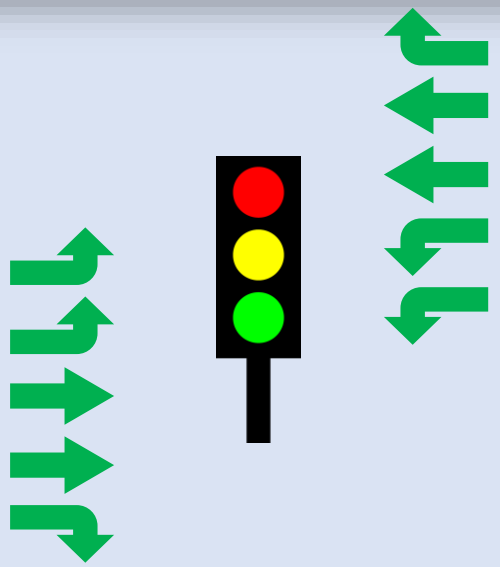
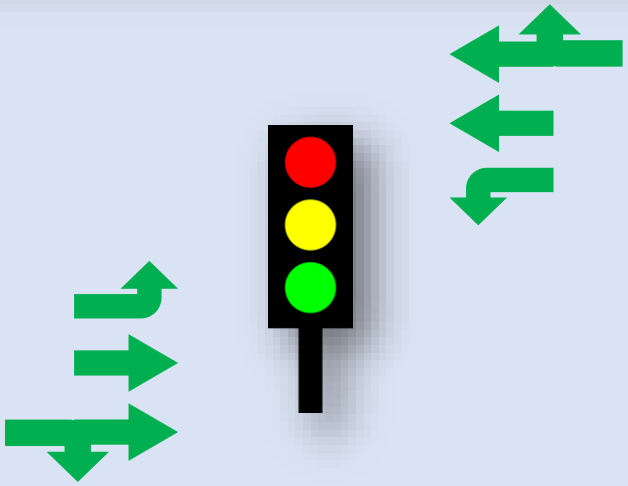




AADT:
E-W = 41,500 vpd
N-S = 40,250 vpd



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Maintaining Signal Detection = Maintaining Capacity

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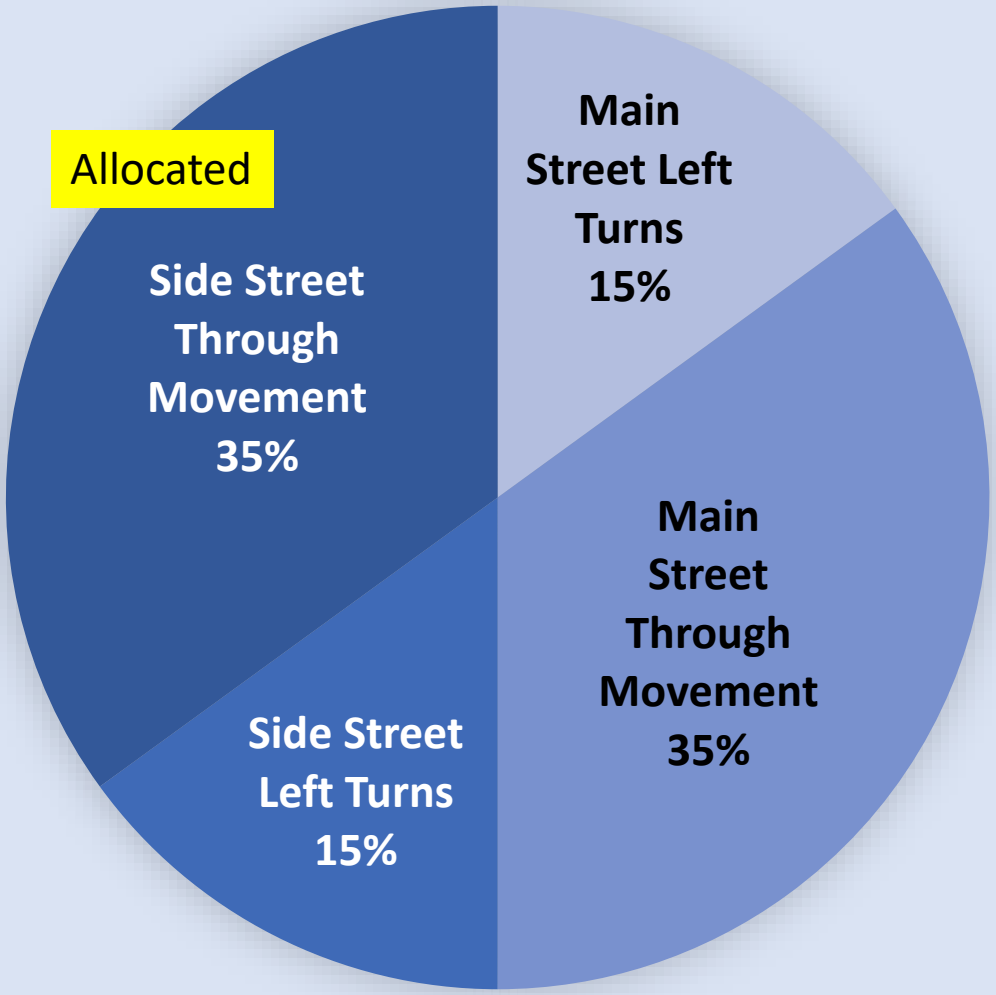
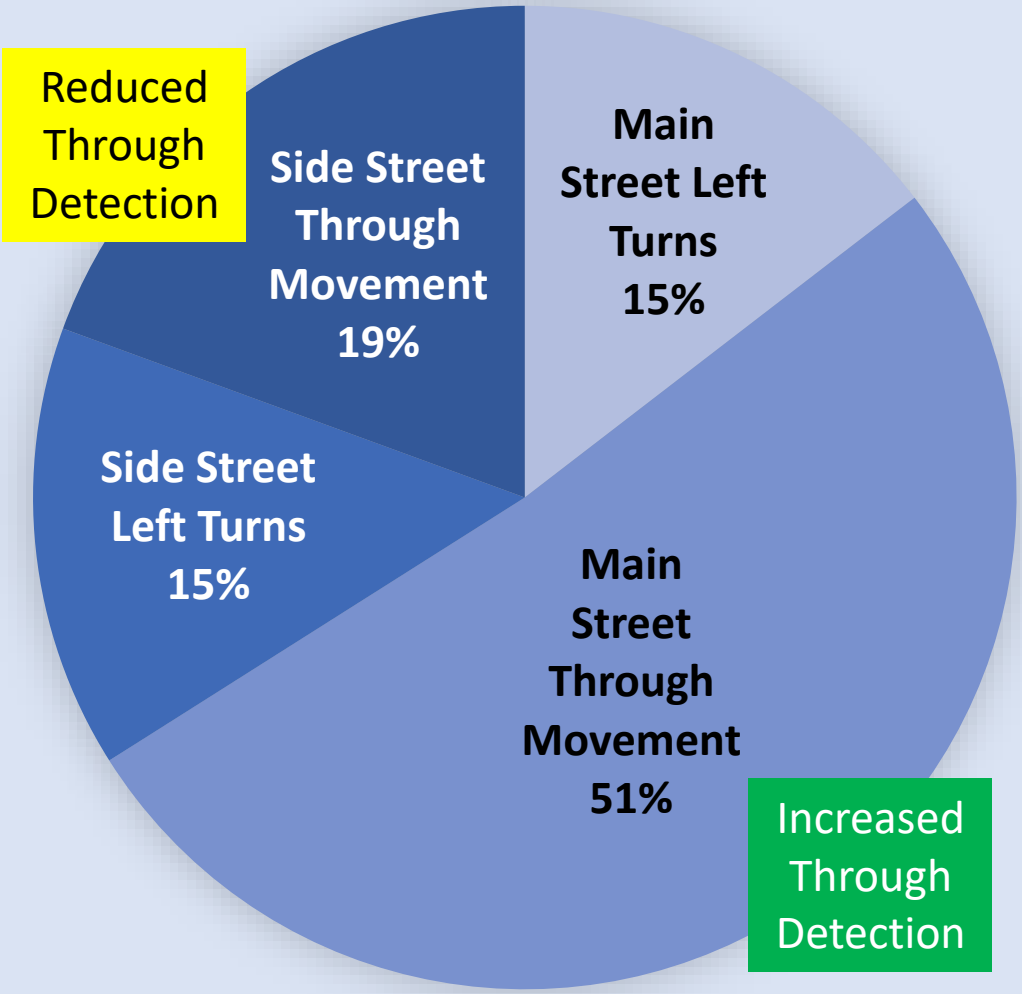
Percent of Signal Cycle



Percent of Signal Cycle



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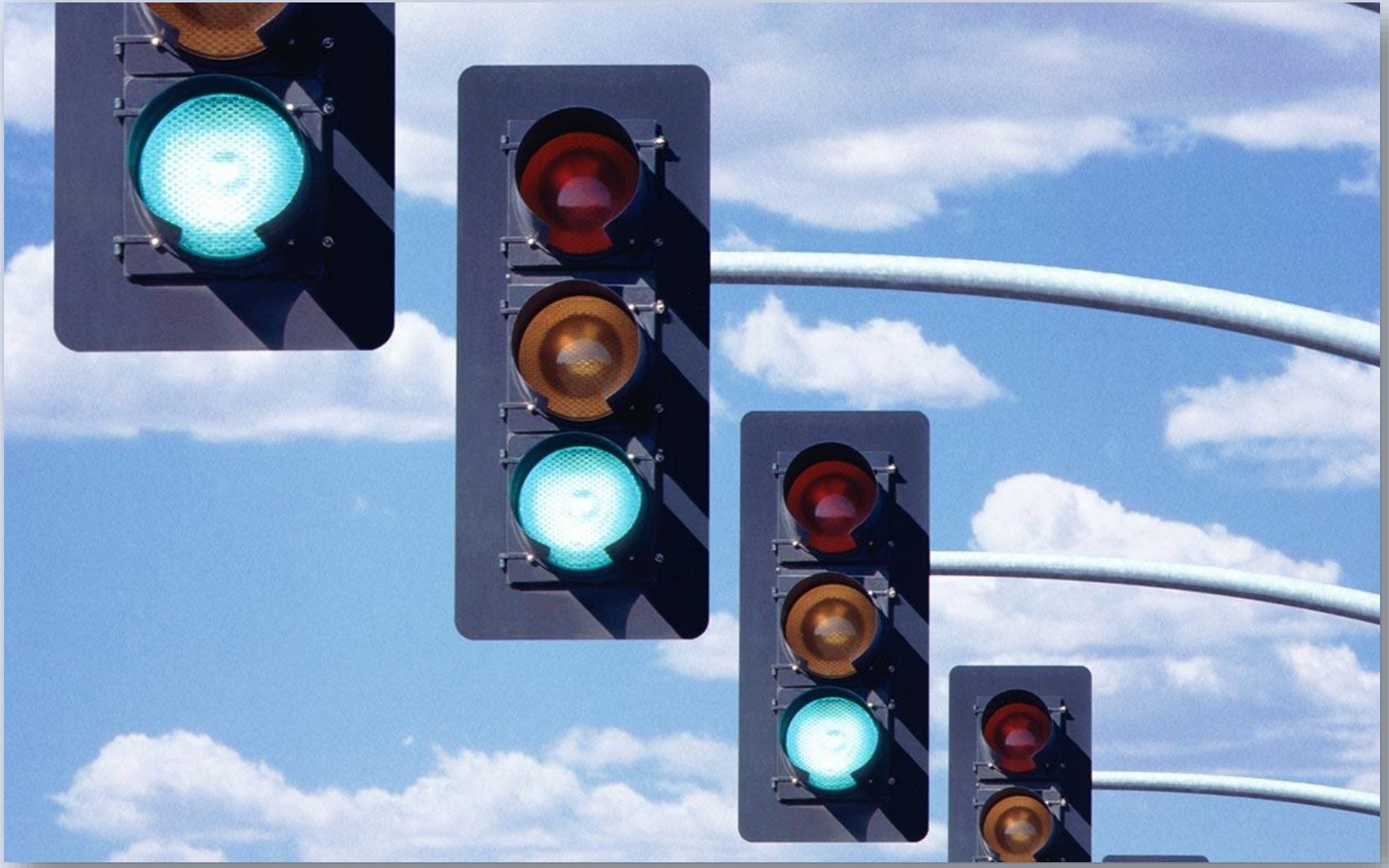
Maintaining Signal Coordination = Maintaining Capacity



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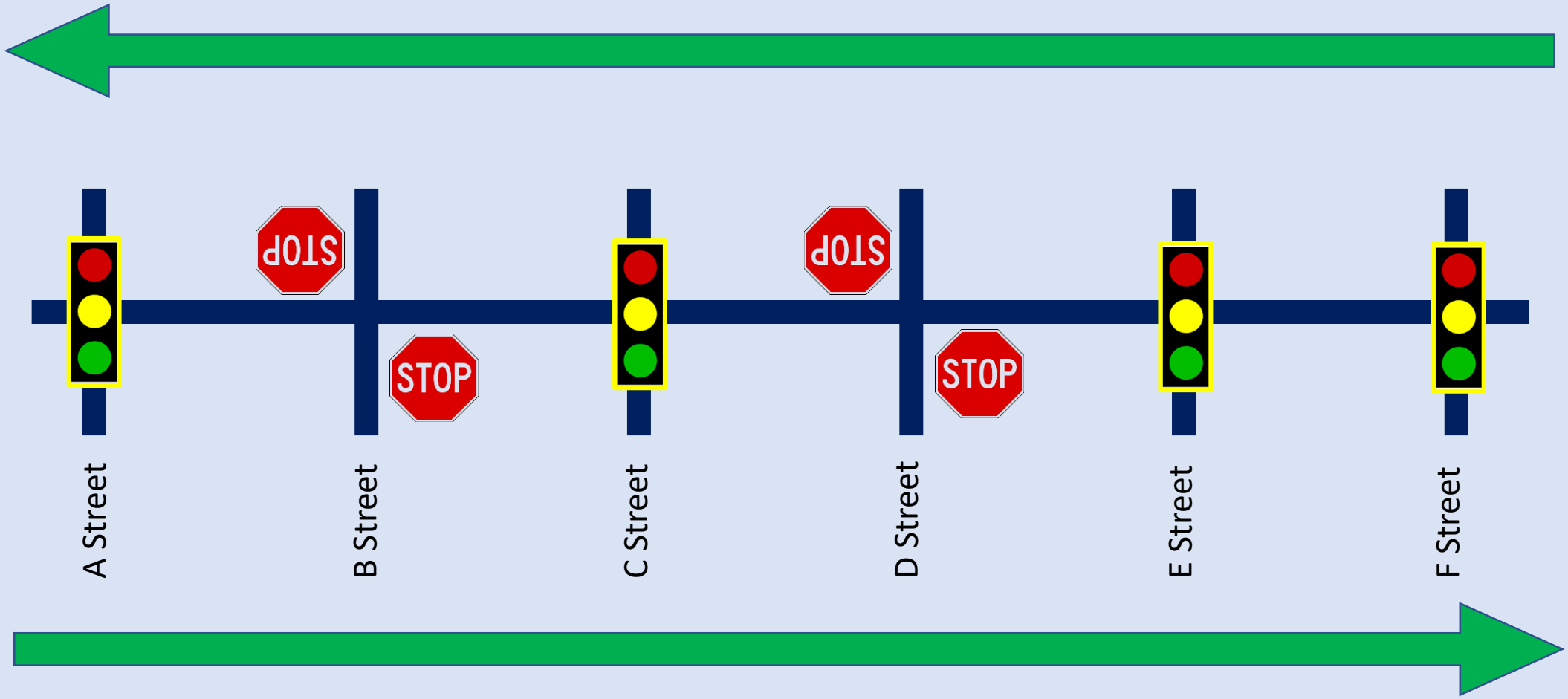
Maintaining Signal Coordination = Maintaining Capacity



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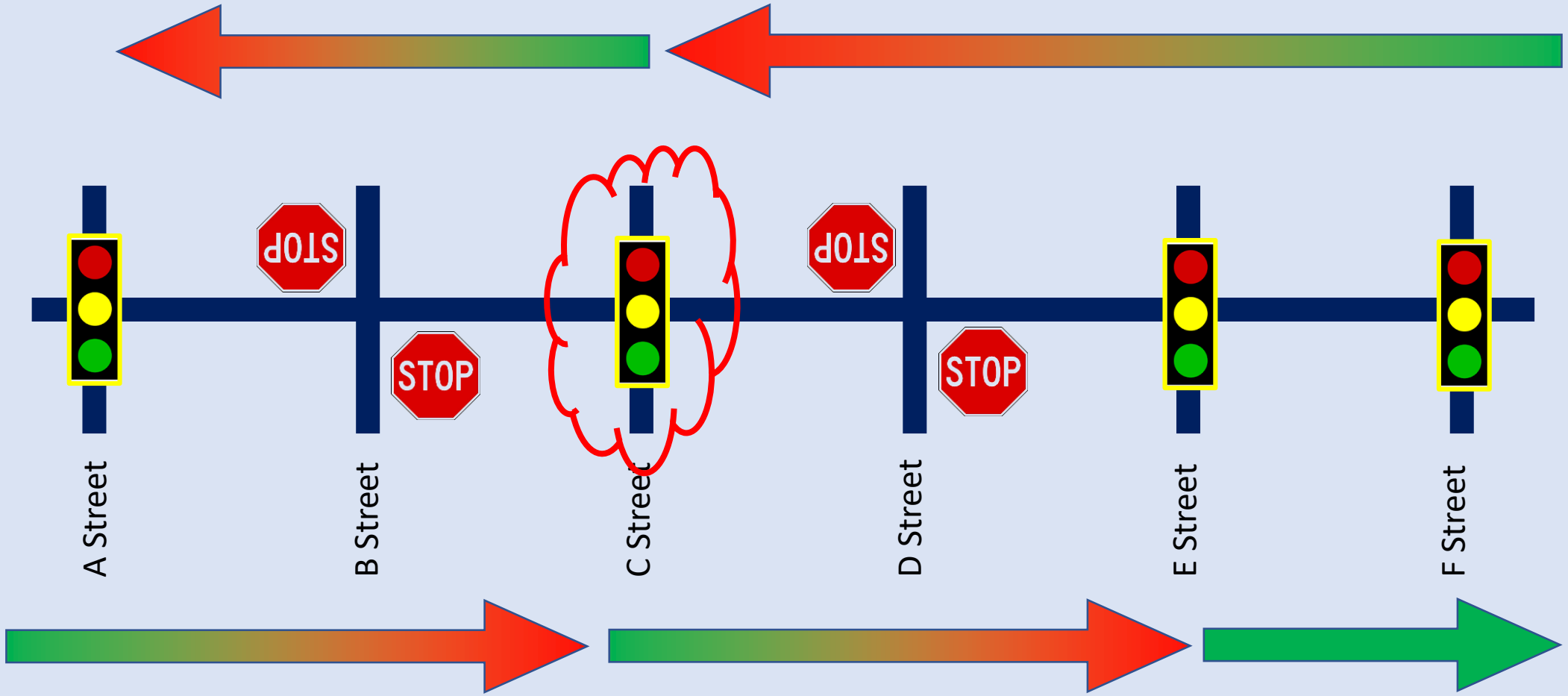
Maintaining Signal Coordination = Maintaining Capacity



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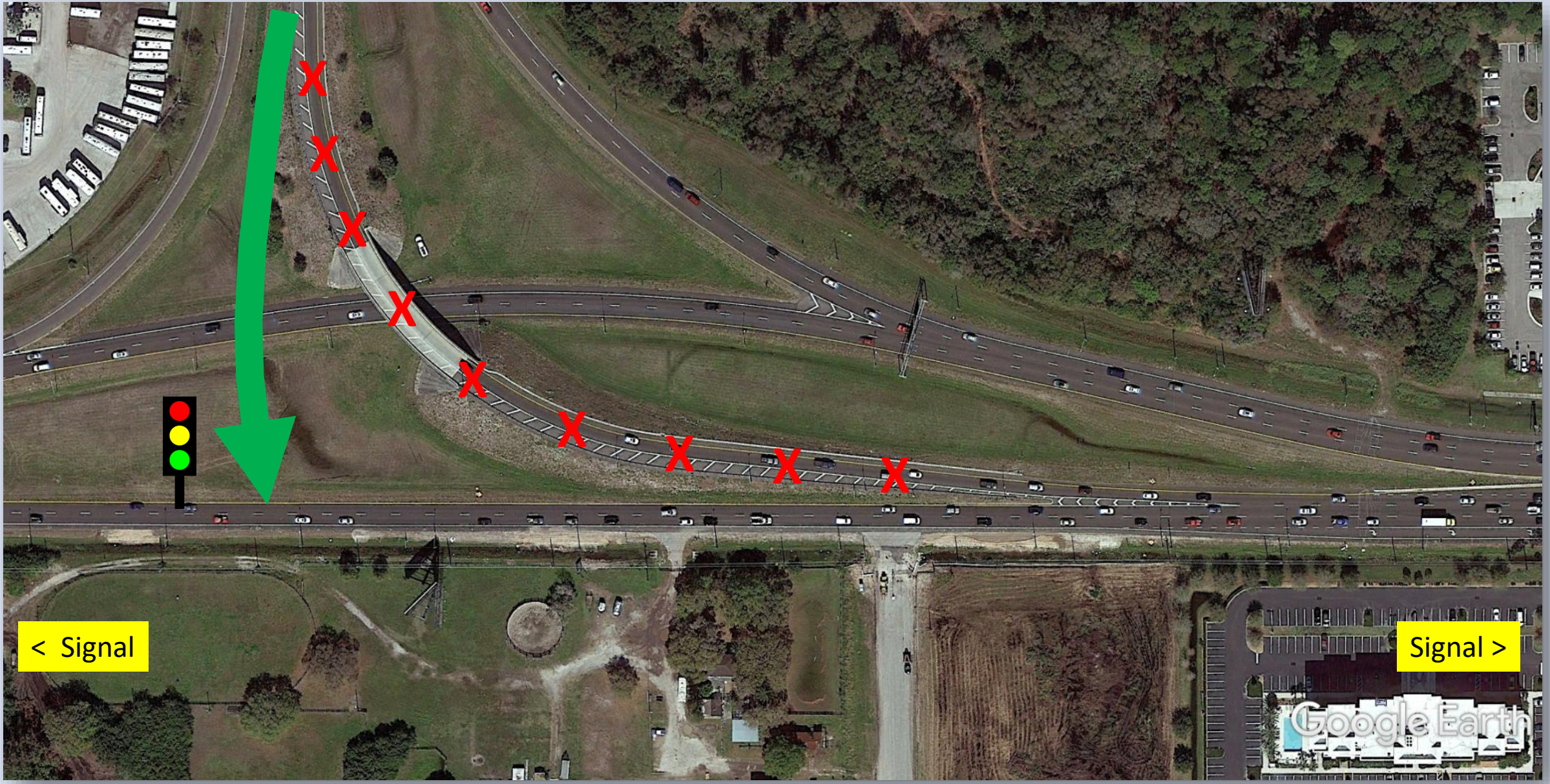

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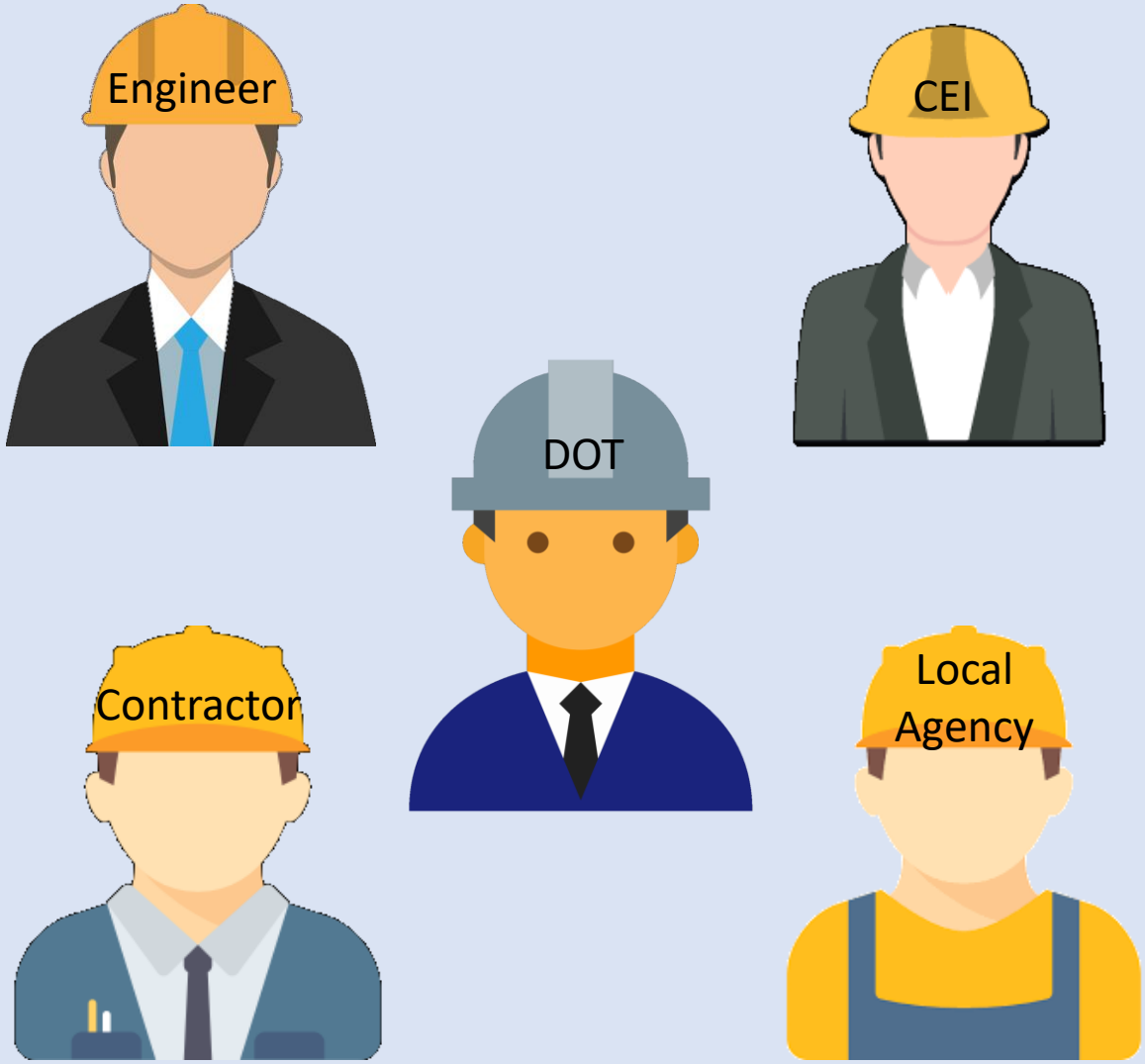

- It wasn't in the Plans.
- It's not in the Specifications.
- We had to design it this way.
- We don't want a change order.
- We don't want a claim.
- We don't want a delay.
- It's only for a couple of months.
- We can't accept the liability.
- The motorists will learn to go another way.

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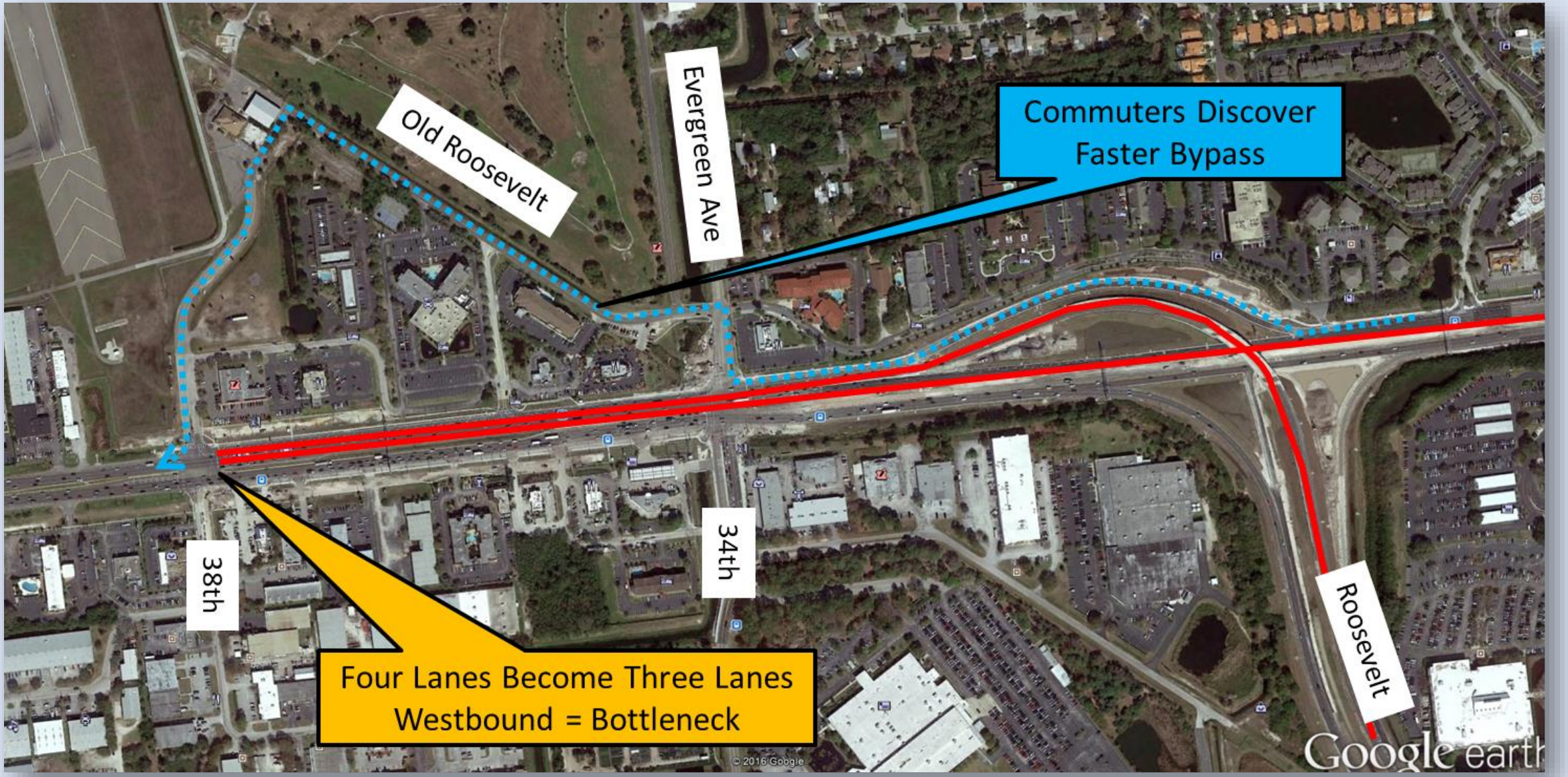

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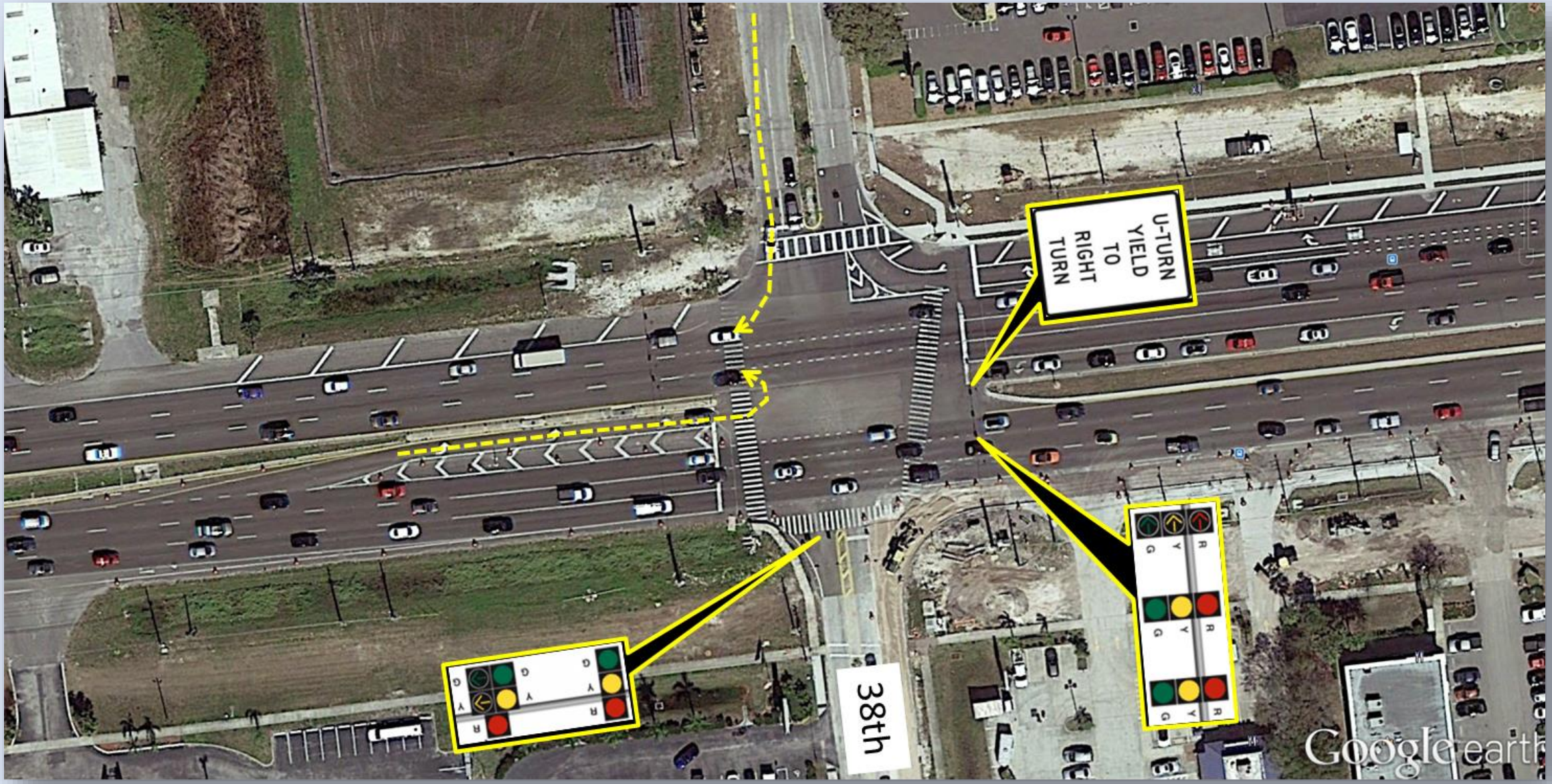

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Takeaways:

- Recognize Responsibilities to provide Safety and Convenience to Road Users
- Involve Appropriate Stakeholders in Project Development
- Carefully Consider and Develop Logical Transportation Management Plan (TMP)
- Include Details on MOT / TTC in PS&E Package
- Work Together to Find Solutions

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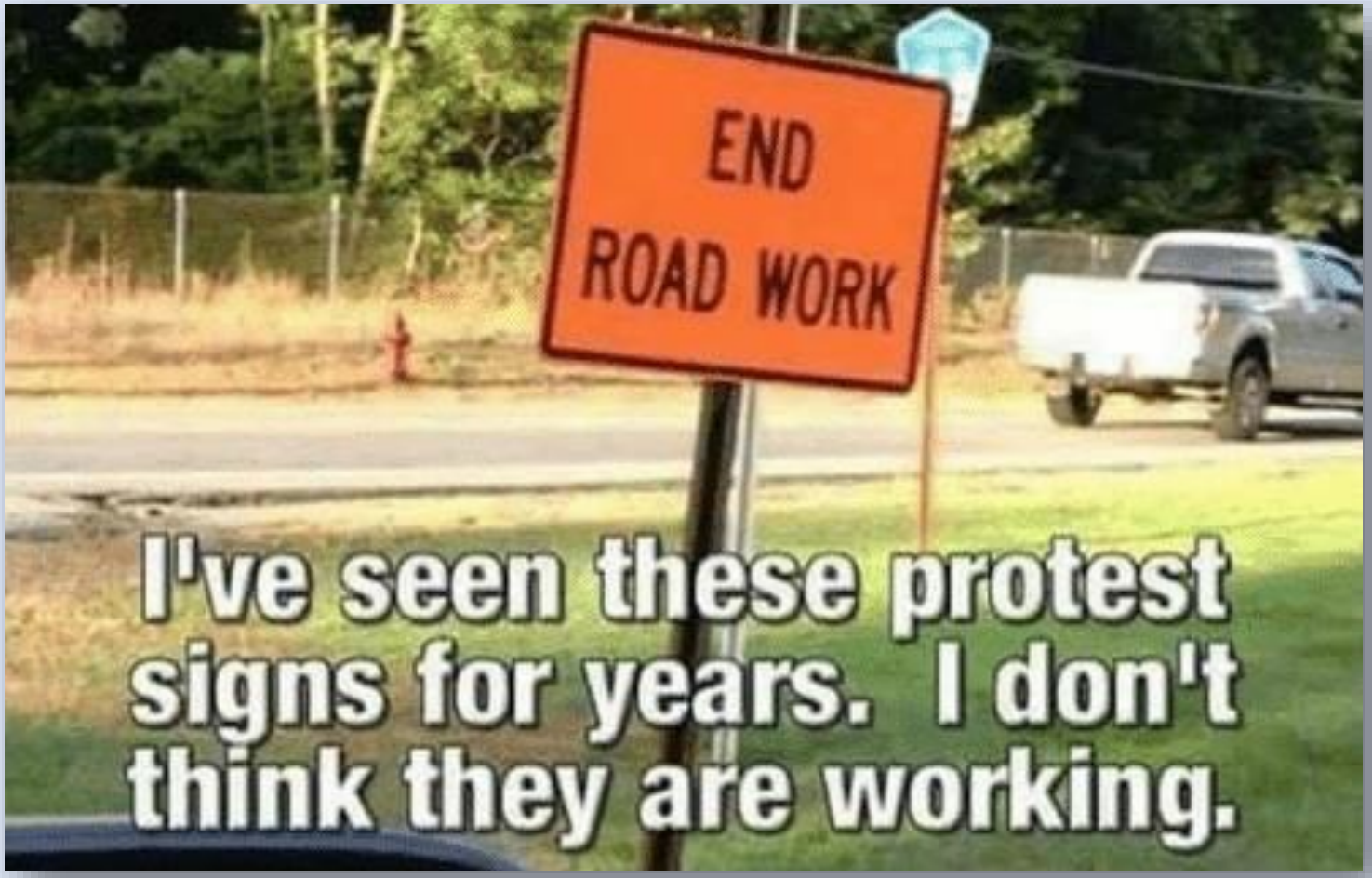

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