



# Boonsboro Comprehensive Traffic Study

Results and Recommendations

March 2017



# Areas of Concentration

## Speed Study

Main Street (US 40A) at Maple Avenue (MD 66)

Main Street at Shafer Park Drive/Orchard Drive

Main Street at Potomac Street (MD 34)/St Paul Street

# SPEED STUDY



# Speed Study

## Existing Westbound Speed Zones

Driving into Town: 40 MPH → **30 MPH** at  
MD 67/Rohrersville Road



From MD 67 to 0.3 Miles East of MD 68/Lappans  
Road: **30 MPH**

From 0.3 Mile East of MD 68 /Lappans Road to out of Town: **40 MPH**

# Sections on Main Street under Speed Study

Section A: MD 67/Rohrersville Road to 0.1 mile east of Mousetown Road. (0.25 mile)

Section B: 0.1 mile east of Mousetown Road to Napa Alley/Gaines Place (0.54 mile)

Section C: Napa Alley to Thomas Lane (0.45 mile)

Section D: Thomas Lane to MD 68/Lappans Road (0.55 mile)

# Sections of Main Street under Speed Study



**Thomas Lane to MD 68 (0.55 mile)**

**Napa Alley to Thomas Lane (0.45 mile)**

**0.1 mile east of Mousetown Road to Napa Alley (0.54 mile)**

**MD 67 to 0.1 mile east of Mousetown Road. (0.25 mile)**

# Methods Used for Speed Analysis

## **Prevailing Speed or 85<sup>th</sup> Percentile**

Operating speed sample of 100+/- drivers

## **USLIMITS**

Advisory program from Federal Highway Admin. (FHWA)

Quantitative web-based tool

Variety of factors used: traffic volumes, terrain, road alignment, road type, etc.

# Results and Recommendations of Speed Study



Thomas Lane to MD 68 (0.55 mile)

Napa Alley to Thomas Lane (0.45 mile)

0.1 mile east of Mousetown Road to Napa Alley (0.54 mile)

MD 67 to 0.1 mile east of Mousetown Road. (0.25 mile)

# Questions and Comments

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# Main Street at Maple Avenue

## Areas of Study

Operational Analyses

School Zone & Pedestrian Crossing

# First things First...

## What's a Level of Service (LOS)?



### LOS

A - Very Good

B - Good

C - Okay

D – Tolerable, unless your late for work

E – Frustrating but doable

F - Very frustrating, often just crazy

# Main Street at Maple Avenue

## Results from Operational Analyses

- The longest AM queue was 10 vehicles at the eastbound approach and 5 vehicles for the westbound approach.
- Eastbound vehicles were observed to bypass vehicles waiting to turn left.
- The overall intersection Level of Service (LOS) operates is an A.
- Main Street eastbound: LOS B in the AM and LOS C in the PM.
- Maple Avenue southbound left turn: LOS B in the AM & PM.

# Main Street at Maple Avenue - Eastbound Approach

## Results & Recommendations

- The timing for eastbound Main Street should remain the same to avoid an increase in the delay of southbound Maple Avenue left-turn.
- Place a left turn lane at the eastbound approach of Main Street.
  - The left-turn lane, without a timing change, will improve operations for this approach.
  - Removal of approximately 150 to 230 feet of parking is needed.

# Concept of Eastbound Left Turn Lane at Maple Street



# Main Street at Maple Avenue Before & After



# Main Street at Maple Avenue - School Zone & Pedestrians

## Results & Recommendations

- Upgrade the signing for the school crossing on southbound Maple Avenue approach.
- Upgrade the crosswalk pavement markings to include crosshatching.
- Upgrade the sidewalk ramps to meet current ADA standards.
- Upgrade intersection with pushbutton Automated Pedestrian Signals (APS) at the crosswalks.

# Questions and Comments

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Main Street at Shafer Park Drive/Orchard Drive

Observations and Analysis

# Main Street at Shafer Park Drive/Orchard Drive Results

- Existing traffic devices are in good working order.
- The PM queues on Main Street from adjacent intersections extended beyond Shafer Park Drive.
- All queues were observed to clear during each signal cycle from the Potomac Street intersection.

# Main Street at Shafer Park Drive/Orchard Drive Results (cont.)

- Parking along eastbound Main Street limits sight distance at Shafer Park Drive. Parking is only restricted between 8AM to 10 AM.
- Less than five students were observed crossing Main Street at afternoon dismissal.
- During peak hours, drivers on Shafer Park Drive were observed to wait greater lengths of time to turn left onto Main Street. Aggressive driving behaviors were observed during these times.

# Main Street Eastbound Parking at Shafer Park Drive



# Main Street at Shafer Park Drive and Orchard Drive

## Recommendations

- Remove the three parking spaces on the south side of the east leg of the intersection to improve sight distance and operational safety.
- Retime the signal at the intersection of Main Street and Potomac Street.
  - Retiming can help provide vehicle platooning and gaps on Main Street to allow Shafer Park Drive and Orchard Drive traffic to enter the highway.

# Main Street at Shafer Park Drive

## Recommendations (cont.)

- Further analysis is needed to upgrade the retiming of the existing signals.
- The signal retiming recommendation can be most effective when implemented with the recommended upgrades for the intersection at Main Street and Potomac/St. Paul Streets.
- Change parking restriction time of 8AM to 10AM to start at 6AM.

# Questions and Comments

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# **Main Street at Potomac Street/St. Paul Street**

## **Observations and Analysis**

# Main Street at Potomac Street/St. Paul Street

## Observations and Analysis

- Longest queue on westbound Main Street during the PM peak period was 30 vehicles.
- Longest queues on eastbound Main Street and Potomac Street were 9 to 12 vehicles.
- The existing LOS for the westbound left turns is an E during the PM peak (with the informal bypass area). The overall LOS is a C during the AM and PM peak.
- The westbound left volumes are 34 during the AM peak hour and 50 during the PM peak hour.

# Main Street at Potomac Street/St. Paul Street Alternative Recommendations

- Option 1: Add a lead-left phase where the only allowed movement is a westbound left to Potomac Street.
- The westbound left turn movement improves from an E to a D.
- The LOS for the Potomac Street and St. Paul Street approaches drop from a B to a C if the lead-left is used.

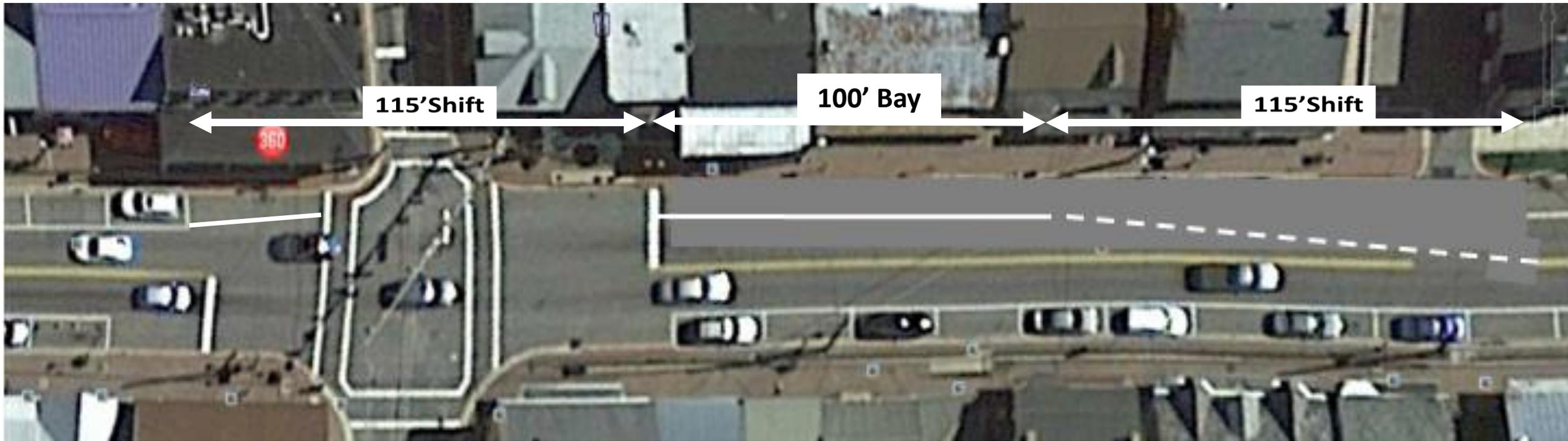
# Main Street at Potomac Street/St. Paul Street Alternative Recommendations(cont.)

- Option 2: Place a 100 feet left turn lane for the Main Street westbound lane. This will improve the movement from a LOS E to a LOS D.
- The overall LOS for the intersection remains as a C with a left turn lane.
- The PM queue will decrease from 1850 feet to 320 feet.
- Four parking spaces will be need to be removed to place the westbound left turn lane.

# Main Street at Potomac Street/St. Paul Street Alternative Recommendations(cont.)

- Option 3: Place a 100 feet left turn lane for the Main Street left turn movement with an exclusive left turn phase
- The overall LOS for the intersection remains as a C with a left turn lane.
- The PM queue will decrease from 1850 feet to 326 feet.
- The same four parking spaces needed for Option 2 will need to be removed to place the westbound left turn lane.

# Concept of Eastbound Left turn Lane with Parking Restriction During Peak Travel Time Potomac and St. Paul Streets



# Potomac and St. Paul Streets Before and After



# Sim Traffic Video of Main at St. Paul/Potomac (existing)



# Sim Traffic Video with proposed Westbound Left-turn Lane



# Questions and Comments

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# Main Street at Potomac Street/St. Paul Street

## Results and Alternative Recommendations (cont.)

Alt. 1:

turn movement from a LOS E to a LOS D.

- The overall LOS for the intersection remains as a C with a left turn lane.
- The PM queue will decrease from 1850 feet to 320 feet.

Alt. 1: Place a 100' left turn lane on westbound Main Street. This will improve the left

turn movement from a LOS E to a LOS D.

- Four parking spaces will be need to be removed to place the westbound left turn lane.