

CEEn-2016CPST- 004

Engineering Changes vs. Neighborhood Impact Assessment

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Project Description:

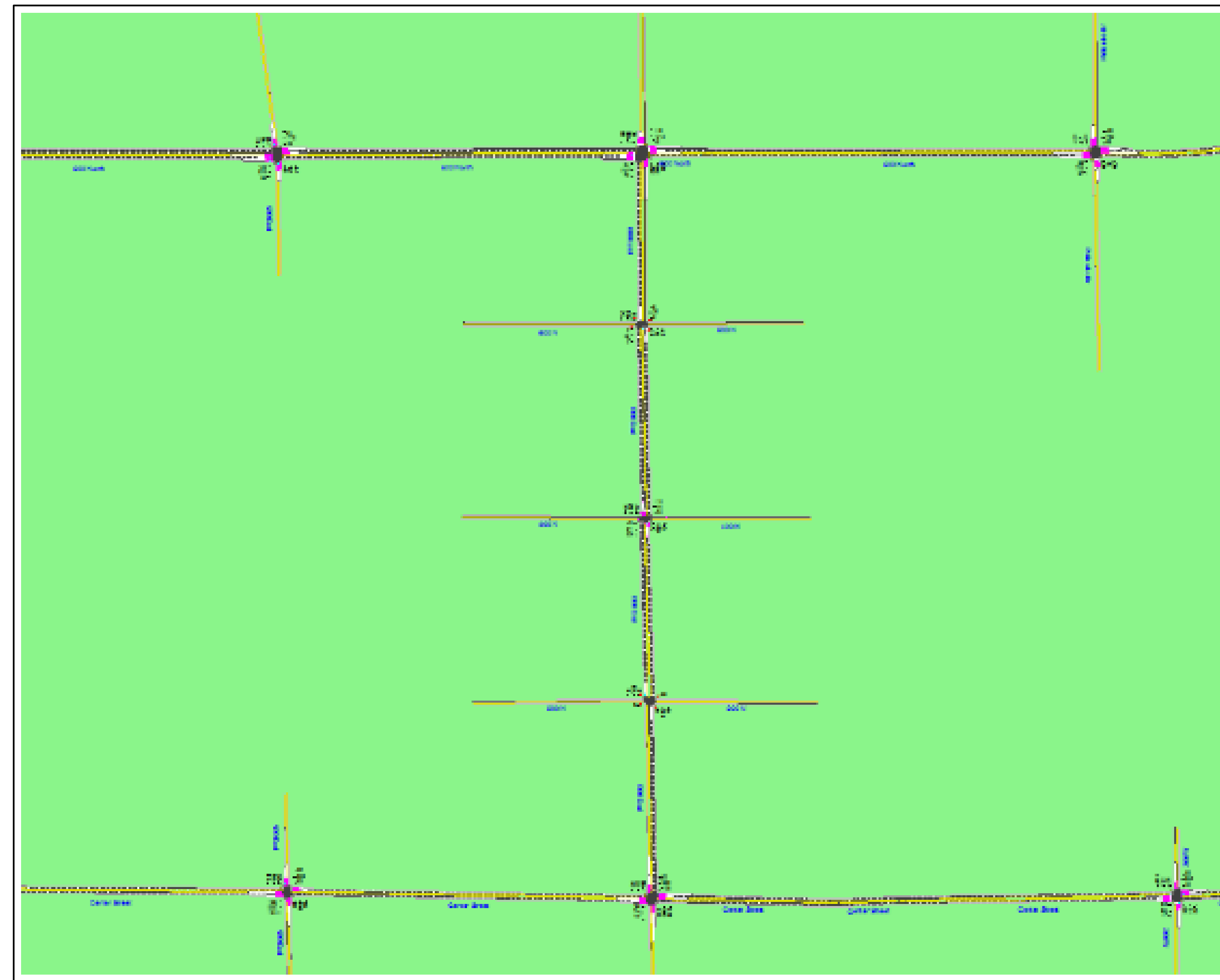
The Orem Department of Transportation wanted to analyze the impact of different traffic control devices at the 400 North 800 East intersection on the movement along the 800 East corridor. An additional analysis was requested to determine the feasibility and impact on local neighborhoods of each traffic control device.

Traffic control devices were implemented at the 400 North 800 East intersection, but traffic results were measured for the intersections at Center street, 200 North, 400 North, 600 North, and 800 North. The traffic control devices analyzed were two-way stop, four-way stop, actuated-coordinated signal, and roundabout. The current intersection has a four-way stop. In 2040 it is likely that the roadway will be widened and all traffic control devices will need to be replaced.

Synchro:

The traffic control devices were modeled in Synchro. The current and projected volumes were used to determine average vehicle speeds and delays at each intersection in the corridor. Assumptions in the model include 3% heavy vehicles, 25 mph speed limit on minor roads, 35 mph speed limit on 800 East, and the 2040 projected traffic volumes are based on a 1% increase per year.

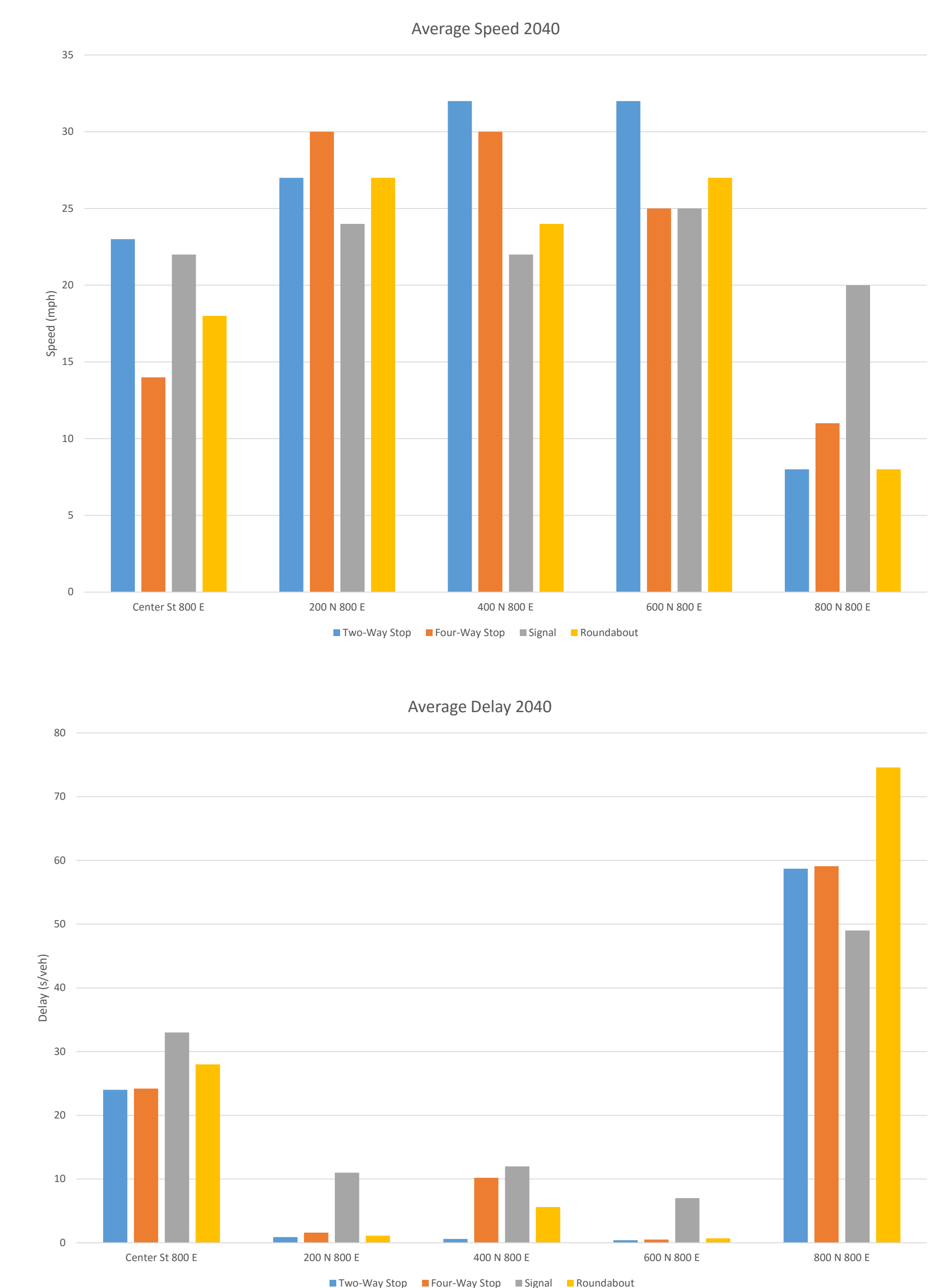
Synchro Model of 800 East Corridor:



Recommendation and Neighborhood Impact:

We recommend installing the actuated coordinated signal at 400 North 800 East. At 800 North, this option decreases the average delay time by 17% and increases the average speed by 80%. At Center street, this option increases the average speed by 57%. The annual cost of this option from 2017 to 2040 is \$11,565. This cost is offset by the decrease in pollution and increase in driver mobility and satisfaction. The signal also allows for access to 800 East by vehicles on the minor roads. The congestion on these minor roads may increase, but the overall congestion of the 800 East corridor will decrease.

Analysis Results:



The roundabout offers the best mobility from 200 North to 600 North. However, this option creates the most backup at Center street and 800 North. The actuated signal with current volumes provides less mobility from 200 North to 600 North, but creates less backup at Center street and 800 North. This effect is greatly increased with 2040 projected volumes. The impact of the two-way stop did not have a significant impact on mobility when compared to the current state.