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# Memorandum

The City of Traverse City  
Engineering Department



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TO: Tim Lodge, P.E., City Engineer  
FROM: Abhishek Deora, Seasonal Engineering Aide  
DATE: Friday, September 22<sup>nd</sup>, 2017  
SUBJECT: Munson Ave/Three Mile Rd to 14<sup>th</sup> St/Division Rd Trip Timing

City Engineering conducted multiple trips between Silver Lake/14<sup>th</sup> and Munson/Three Mile between Thursday, August 31<sup>st</sup> 2017 and Tuesday, September 5<sup>th</sup> 2017 via multiple routes. All routed were performed in both eastbound and westbound directions. The first route, which will be referred to as the Grandview Parkway Route in this memo, started on Munson Avenue at Three Mile Rd, continued westbound onto Grandview Parkway, and after a left turn onto Division St, ended at the intersection. The second route, which will be referred to as the Eighth Street Route in this memo, started on Munson Avenue at Three Mile Rd, continued until the intersection of Eighth St and Munson Ave, where a left turn was made onto Eighth St. After making a left turn onto Eighth St, the route was followed until Eighth St at Union St, where another left turn was made onto Union St, followed by a right turn six blocks later onto Fourteenth St, which then ended after continuing on Fourteenth St until the Division St and Fourteenth St Intersection. The final route followed, which will be referred to as the South Airport Route in this memo, started at the intersection of Munson Avenue and Three Mile Rd heading southbound on Three Mile Rd until a right turn is made onto South Airport Rd. After following South Airport Road for many miles, another right turn is made onto Division St. The South Airport Route ends after following Division St to the Fourteenth St intersection. As a note for this memo, the "Distance Optimization" percentage is calculated by taking the linear length between Munson Ave/Three Mile Rd and Division St/Fourteenth St and dividing it by the average of the linear length and the trip length.

The Grandview Parkway Route has the shortest average trip time with the average trip time clocking in at 0:12:33. The Grandview Parkway also has the least amount of turns, with only one turn heading westbound, and two turns heading eastbound (westbound traffic never has to stop at Grandview Parkway/E Front St, eastbound does). The distance optimization percentage is 83.5%. The mean speed, including stops, is 26.50 MPH and the average time per mile is 0:02:26. The average amount of gasoline used on this trip is .3099 gallons (2.5 pints) with the average gasoline cost for this trip being \$0.78.

The Eighth St Route has an average trip time clocking in at 0:12:56. The Eighth St Route is the most fuel efficient, with a distance optimization percentage at 89.4%, the average gasoline consumed at .2749 gallons (2.2 pints), and the average fuel cost for the trip being \$0.69. The average speed is the slowest of the three routes, being 21.49 MPH and the average time per mile being 0:02:55. There are also the most amounts of turns on this route, with three turns on the Eighth St Route.

The South Airport Route has the longest average trip time, with the average trip time being 0:19:00. With the longest average trip time, it also has the least amount of distance

optimization, with the percentage being 64.4% and the most amount of fuel consumed at .4678 gallons (3.75 pints), costing \$1.017. However, this trip did have the mean speed at 21.15 MPH on average including all stops.

Encl:            Statistics and Raw Data Workbook  
                 Trip Routes