

Jennifer MacDonald <macdonaldj@rochesterhills.org>

RE: 63131-85300-22 Rochester Hills Management

1 message

Gough, Stacey (MDOT) <goughs@michigan.gov>

Thu, Dec 8, 2022 at 6:27 AM

To: Keith Depp <deppk@rochesterhills.org>

Cc: "Patel, Kajal (MDOT)" <PatelK8@michigan.gov>, "Galindo, Steve (MDOT)" <GalindoS@michigan.gov>, "Thomas, Jesse (MDOT)" <ThomasJ19@michigan.gov>, "Adelman, Doug (MDOT)" <AdelmanD@michigan.gov>, "Pozolo, Thomas (MDOT)" <PozoloT@michigan.gov>, Chris McLeod <mcleodc@rochesterhills.org>, Jennifer MacDonald <macdonaldj@rochesterhills.org>, "Gough, Stacey (MDOT)" <goughs@michigan.gov>

Keith,

Attached is the latest review email that was sent to applicant (MDOT doesn't send a "formal" letter we just send review emails).

Please note also that MDOT doesn't perform a FULL permit review until the TIS and conceptual approach are approved (location, # of approaches, & geometrics only). Once those are approved MDOT will review the entire set of plans. Therefore, I imagine MDOT will have more comments once we are in that stage. This is noted in our review email to alert the applicant of our process.

Thanks,

Stacey

Stacey Gough

MDOT Bay Region

ITS, Mobility, & Safety Engineer

5859 Sherman Rd

Saginaw, MI 48604

Cell - 248-895-2558

1. Trip gen for steady state: per our previous meetings we discussed around 10 to 12% pass by rate was appropriate for trip gen. instead of that 30% pass by rate is used in the analysis.

| | la | DIE 4: I | rip Ge | enera | tton | (Oper | iing | Day) | Sum | nary | | | | | |
|------------------------------|--------|-----------|----------|-------|--------------|-----------|------|--------------|-----------|---------|----------------|-------------|----------|------------------|-------------|
| Land Use | ITE | Amount | Units | AM | Peak (vph | Hour) | PM | Peak (vph | Hour) | SA H | T MD our (v | Peak ph) | SA He | T PM I our (v | Peak ph) |
| | Code | | | In | Out | Total | In | Out | Total | In | Out | Total | In | Out | Total |
| Chick-fil-A | 820 | 4,978 | SF | 54 | 55 | 109 | 162 | 161 | 323 | 190 | 195 | 385 | 156 | 156 | 312 |
| | | Pass-By | r (10%) | 5 | 5 | 10 | 16 | 16 | 32 | 19 | 19 | 38 | 15 | 15 | 30 |
| | | Ne | w Trips | 49 | 50 | 99 | 146 | 145 | 291 | 171 | 176 | 347 | 141 | 141 | 282 |
| Strip Retail Plaza (<40k SF) | 822 | 5,036 | SF | 7 | 5 | 12 | 24 | 24 | 48 | 17 | 16 | 33 | 17 | 16 | 33 |
| | | Tota | al Trips | 61 | 60 | 121 | 186 | 185 | 371 | 207 | 211 | 418 | 173 | 172 | 345 |
| | | Total P | ass-By | 5 | 5 | 10 | 16 | 16 | 32 | 19 | 19 | 38 | 15 | 15 | 30 |
| Existing (I | olumes | 9 | 5 | 14 | 17 | 13 | 30 | 16 | 24 | 40 | 18 | 15 | 33 | | |
| | Tota | I Net Nev | v Trips | 47 | 50 | 97 | 153 | 156 | 309 | 172 | 168 | 340 | 140 | 142 | 282 |

| | Та | ble 5: T | rip Ge | enera | ation | (Stea | dy S | tate) | Sumn | nary | | | | | |
|------------------------------|--------|-----------|----------|-------|--------------|-----------|------|---------------|-------|----------|------------------|-------------|-----------|------------------|-------------|
| Land Use | ITE | Amount | Units | AM | Peak (vph | Hour) | PM | Peak (vph) | Hour | SA' H | F MD I our (v | Peak ph) | SAT He | F PM I our (v | Peak ph) |
| | Code | | | In | Out | Total | In | Out | Total | In | Out | Total | In | Out | Total |
| Chick-fil-A | 820 | 4,978 | SF | 54 | 55 | 109 | 162 | 161 | 323 | 190 | 195 | 385 | 156 | 156 | 312 |
| | | Pass-By | (30%) | 16 | 16 | 32 | 48 | 48 | 96 | 58 | 58 | 116 | 47 | 47 | 94 |
| | | Ne | w Trips | 38 | 39 | 77 | 114 | 113 | 227 | 132 | 137 | 269 | 109 | 109 | 218 |
| Strip Retail Plaza (<40k SF) | 822 | 5,036 | SF | 7 | 5 | 12 | 24 | 24 | 48 | 17 | 16 | 33 | 17 | 16 | 33 |
| | | Tota | al Trips | 61 | 60 | 121 | 186 | 185 | 371 | 207 | 211 | 418 | 173 | 172 | 345 |
| | | Total P | ass-By | 16 | 16 | 32 | 48 | 48 | 96 | 58 | 58 | 116 | 47 | 47 | 94 |
| Existing (I | olumes | 9 | 5 | 14 | 17 | 13 | 30 | 16 | 24 | 40 | 18 | 15 | 33 | | |
| | Tota | I Net Nev | v Trips | 36 | 39 | 75 | 121 | 124 | 245 | 133 | 129 | 262 | 108 | 110 | 218 |

- 2. How vehicles are going to weave to exit with short queue for exiting vehicles at driveway. What impact does exiting backups have on service rate? Internal circulation comment has consistently not addressed since 1st review.
- 3. Right turn for the driveway needs to show existing crosswalk on Rochester Rd.
- Queue analysis: Provide detailed calculations for queueing analysis. Provide sources used for data used in queuing analysis (e.g., time per vehicles) for Chick-fil-A. Random arrival analysis is missing and needed as a part of queueing analysis.

| Opening Day Operation | IS | Normal Operations | |
|-------------------------------|-------|-------------------------------|------|
| STACKING SPACE CALCUL | ATOR | STACKING SPACE CALCUL | ATOR |
| Number of Arrivals | 186 | Number of Arrivals | 133 |
| Peak Period Time (minutes) | 60 | Peak Period Time (minutes) | 60 |
| % Arrivals during peak period | 100% | % Arrivals during peak period | 100% |
| Time per Vehicle (s) | 36 | Time per Vehicle (s) | 36 |
| Vehicle Stacking Length (FT) | 25 | Vehicle Stacking Length (FT) | 25 |
| Service Rate | 100 | Service Rate | 100 |
| Arrival Rate | 186 | Arrival Rate | 133 |
| TOTAL QUEUE (Veh) | 86 | TOTAL QUEUE (Veh) | 33 |
| TOTAL QUEUE (ft) | 2,150 | TOTAL QUEUE (ft) | 825 |

Total vehicle queue = 33 (report even shows Kalamazoo has 41 vehicles). Random Google imagery shows 50+ cars for Novi Chick-fil-A and additional cars stacked on Mall Road.

5. How emergency is going to be handled due to lack of escape lane if someone in the queue has emergency and when they are trying to exit?

140s cycle length was used for all existing and future scenarios. Any final proposed timings need to be optimized, and not just using the max 140s cycle that SCATS allows. The backup timings for SCATS should come from optimized models.

| s | Normal Operations | |
|-------|---|--|
| ATOR | STACKING SPACE CALCUL | ATOR |
| 186 | Number of Arrivals | 133 |
| 60 | Peak Period Time (minutes) | 60 |
| 100% | % Arrivals during peak period | 100% |
| 36 | Time per Vehicle (s) | 36 |
| 25 | Vehicle Stacking Length (FT) | 25 |
| 100 | Service Rate | 100 |
| 186 | Arrival Rate | 133 |
| 86 | TOTAL QUEUE (Veh) | 33 |
| 2,150 | TOTAL QUEUE (ft) | 825 |
| | s ATOR 186 60 100% 36 25 100 186 86 2,150 | sNormal OperationsATORSTACKING SPACE CALCUL186Number of Arrivals60Peak Period Time (minutes)100%% Arrivals during peak period36Time per Vehicle (s)25Vehicle Stacking Length (FT)100Service Rate186Arrival Rate86TOTAL QUEUE (Veh) |

Concern about accommodating total queue of 2150' on opening day with 1636' stacking.

- During peak time periods, Chick-fil-A utilizes employees stationed outside along the drive-through queue, with menu tablets to take patrons orders, eliminating the need for the menu kiosk and providing additional queueing storage space. This also helps to expedite the ordering and payment process, thus increasing the service rate.
- The opening day queueing can accommodate a minimum of 1,636-LF of stacking, with the option to expand further into the parking lot as necessary for additional storage as necessary to accommodate additional vehicle demand.

These models do provide a comparison:

- 1. First screen shot is Saturday mid-day with existing volumes and existing splits (assuming max 140s cycle):
 - a. 112s split for M-150
 - b. 28s split for driveway
 - c. Note natural cycle length is 80s
- 2. Second screen shot is Saturday mid-day with future volumes and existing splits (assuming max 140s cycle):
 - a. 112s split for M-150
 - b. 28s split for driveway
- 3. Third screen shot is Saturday mid-day with future volumes and improvements including N/S left turn phasing, a SBRT lane, and proposed splits (assuming max 140s cycle):
 - a. 83s split for M-150
 - b. 41s split for driveway
 - c. 16s for N/S Left turn phase
 - d. Note natural cycle length is 80s

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| A | Import | rt from ATM | S.now: | Import | | Total Split (: | s] | 28.0 | 28.0 | - | 28.0 | 28.0 | - | 112.0 | 112.0 | 112.0 | 112.0 | 112.0 | - | - | - | | | | | |
| A | Expo | rt to ATMS. | now: | Export | _ | Yellow Time | e (s) | 3.5 | 3.5 | - | 3.5 | 3.5 | - | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | - | - | - | | | | | |
| ER | @ Zone | с | | | A | All-Red Tim | ie (s) | 2.5 | 2.5 | - | 2.5 | 2.5 | _ | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | - | - | - | | | | | |
| | ∞ XEa | st (It); | | 22919 | 30 | Lost Time A | Adjust (s) | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | | | | | |
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| | @ Desc | ription | | Antid Con | | Hecal Mod Canad Initial | le (mah) | None | None | | None | None | - | C-Max | U-Max | C-Max | C-Max | U-Max | - | - | - | | | | | |
| | Contract | tor rype | | Acto-Coo | | C Asturbed E | (mpn) | 21.0 | 20 | | 21.0 | 20 | | 105.0 | 105.0 | 105.0 | 105.0 | 105.0 | - | | | | | | | |
| | O Look | Timinani (S). | | 140 | | Actuated El | ICC. Green (s) | 21.0 | 21.0 | _ | 21.0 | 21.0 | _ | 0.76 | 0.76 | 0.70 | 0.70 | 0.70 | _ | | | | | | | |
| | O Dotin | inte Cucle Lu | enativ | Ontimize | | Actuated g/ Volume to E | Capacity Batio | 0.16 | 30.0 | _ | 0.16 | 0.16 | | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | _ | | | | | | | |
| | O Optin | nize Splite: | ongen. | Optimize | - | Control Dela | au (e) | 51.4 | 26.1 | _ | 104.2 | 14.8 | | 5.8 | 10.9 | 1.9 | 17.5 | 5.2 | | | | | | | | |
| | Q Actus | ated Cucle(s | a). | 140 | | Control Dela | au (e) | 0.0 | 0.0 | _ | 0.0 | 0.0 | _ | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | _ | _ | _ | | | | | |
| | O Natu | ral Cycle(s) | , | 80 | 0 | O Total Delay | (s) | 51.4 | 26.1 | _ | 104.2 | 14.8 | _ | 5.8 | 10.9 | 1.9 | 17.5 | 5.3 | - | - | _ | | | | | |
| | O Max | v/c Batio: | | 0.9 | 34 | Level of Se | rvice | D | C | _ | F | B | _ | A | В | A | B | A | _ | _ | _ | | | | | |
| | Inters | ection Dela | w (s): | 14 | .0 | Approach D | Delay (s) | _ | 38.8 | _ | - | 81.0 | - | _ | 10.3 | - | _ | 6.1 | - | - | _ | | | | | |
| | Inters | ection LOS | | | в | Approach L | .05 | _ | D | - | - | F | _ | - | В | - | - | A | _ | _ | _ | | | | | |
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| | ICU L | .OS: | | | E | Queue Len | gth 95th (ft) | 30 | 19 | | #360 | 52 | _ | m3 | 316 | 19 | m28 | 188 | _ | - | _ | | | | | |
| | Offse | et (s) : | | 114 | .0 | Stops (vph) |) | 12 | 5 | - | 175 | 15 | - | 2 | 735 | 9 | 41 | 319 | - | - | - | | | | | |
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| Roc | hester Ro | ad (M-150) | & Site Drive/Meij | er-Lowe's Drive (22 | 29190 | 198788) | | | | | | | | | | | | | | | | | | v/c | ok | Mins ok |

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| AN | @ Node # | 2 | Mini | num Initial (s) | 7.0 | 7.0 | - | 7.0 | 7.0 | - | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | - | - | - | | | | |
| ë | @ ATMS.now Controller ID | 0 | Mini | num Split (s) | 13.0 | 13.0 | - | 13.0 | 13.0 | - | 16.3 | 16.3 | 16.3 | 16.3 | 16.3 | - | - | - | | | | |
| MA | Import from ATMS.now: | Import | Tota | l Split (s) | 28.0 | 28.0 | - | 28.0 | 28.0 | - | 112.0 | 112.0 | 112.0 | 112.0 | 112.0 | - | - | - | | | | |
| NA | Export to ATMS.now: | Export | Yelk | w Time (s) | 3.5 | 3.5 | - | 3.5 | 3.5 | - | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | - | - | - | | | | |
| SER | @ Zone: | A | AI-R | ed Time (s) | 2.5 | 2.5 | - | 2.5 | 2.5 | - | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | - | - | - | | | | |
| | @ X East (ft): | 229190 | Lost | Time Adjust (s) | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | | | | |
| | @ Y North (ft): | 198798 | Cage | jing Phase? | - | - | - | - | - | - | - | - | - | - | - | _ | - | - | | | | |
| | @ Z Elevation (it): | 0 | Allow | v Lead/Lag Optimize? | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | |
| | @ Description | | Rec | all Mode | None | None | - | None | None | - | C-Max | C-Max | C-Max | C-Max | C-Max | - | - | - | | | | |
| | @ Control Type | Actd-Coord | Spectrum | ed limit (mph) | _ | 25 | - | - | 25 | - | _ | 50 | - | - | 50 | - | - | - | | | | |
| | Cycle Length (s): | 140.0 | Actu | ated Effct. Green (s) | 22.0 | 22.0 | - | 22.0 | 22.0 | - | 105.7 | 105.7 | 105.7 | 105.7 | 105.7 | - | - | - | | | | |
| | Lock Timings: | | Actu | ated g/C Ratio | 0.16 | 0.16 | - | 0.16 | 0.16 | - | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | - | - | - | | | | |
| | Optimize Cycle Length: | Uptimize | O Volu | me to Capacity Ratio | 0.64 | 0.48 | - | 1.37 | 0.27 | - | 0.83 | 0.56 | 0.09 | 0.64 | 0.65 | _ | - | _ | | | | |
| | O Uptimize Splits: | Uptimize | 0 Con | rol Delay (s) | 69.9 | 40.7 | | 244.9 | 20.0 | - | 61.6 | 10.4 | 1.7 | 19.6 | 5.6 | - | - | | | | | |
| | Actuated Lycle(s): | 140.0 | O Liue | ue Delay (s) | 0.0 | 0.0 | _ | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | _ | - | _ | | | | |
| | Natural Lycle(s): | 55.0 | 0 1 00 | Delay (s) | 69.9 | 40.7 | | 244.9 | 20.0 | - | 61.6 | 10.4 | 1.7 | 19.6 | 5.8 | _ | | _ | | | | |
| | Max V/C Hatto: | 1.3/ | O Leve | al of Service | E . | 54.7 | | P. | 100.0 | _ | E | 12.0 | A | в | A | _ | _ | _ | | | | |
| | Intersection Delay (s): | 24.0 | O App | oach Delay (s) | | 04.7 | | - | 180.3 | - | | 12.8 | - | | 6.6 | | - | - | | | | |
| | o ICU | 0.07 | O Our | oach LUS | 101 | 02 | | ~2005 | 10 | | = | 405 | | | 105 | | | | | | | |
| | | 0.07 | O Que | ue Length 50th (it) | 121 | 119 | | 200 | 70 | | #209 | 405 | 17 | 20 | m201 | | | | | | | |
| | C Offeet (e) : | 114.0 | Q Stor | e (unh) | 99 | 69 | _ | 149 | 25 | _ | 70 | 742 | 10 | 45 | 371 | _ | | _ | | | | |
| | Beferenced to: | Begin of Green | O Euel | s (vpn) | 2 | 1 | | 11 | 1 | _ | 3 | 18 | 0 | 1 | 12 | _ | | | | | | |
| | Referenced to: Referenced Research | 2.C NDTI CDTI | v V Puer | Used (g/ni) | 6 | 1.1 | | | 1.1 | | | 10 | ٩ | | 14 | | _ | | | | | ~ |
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| | 112 s | | | | | | | | | | | | | | | | | 28 s | - | | | |
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| Mini | mum Initial Green Time, also called Min | imum Green Time | | | | | | | | | | | | | | | | | | | v/c : | 1 Mins o |

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| F | ile Home | Options | Transfer Optim | nize | Reports Help | | Future SAT M | 0 - Opening | g Day (109 | 6 Pass-B | y) - IMP 🔹 | | | | | | | | | 📃 🗋 | > 11 | 0: 0: 0 / | 0: 0: 0 |
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| ∞ | × - | | | | | | | - | | | | | | 2 | Rochest | er Road (1 | M-150) & | Site Drive | e/Meijer-Lor | we's Drive | | | |
| NG SCE | NODE SE | TTINGS | | ^ | TIMING SETTINGS | ▶ EBL | EBT EBR | WBL | ← WBT | WBR | NBL | ↑ NBT | ▶ NBR | SBL | ↓ SBT | √ SBR | AL PED | HOLD | | | | | ^ |
| NA | @ Node # | | 2 | | Minimum Initial (s) | 7.0 | 7.0 - | - 7.0 | 7.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | | - | | | | | |
| R | @ ATMS.now Conl | roller ID | 0 | | Minimum Split (s) | 13.0 | 13.0 - | - 13.0 | 13.0 | - | 11.3 | 16.3 | 16.3 | 11.3 | 16.3 | 16.3 | - | - | | | | | |
| MA | Import from ATM | S.now: | Import | | Total Split (s) | 41.0 | 41.0 - | - 41.0 | 41.0 | - | 16.0 | 83.0 | 83.0 | 16.0 | 83.0 | 83.0 | - | - | | | | | |
| NAC | Export to ATMS. | now: | Export | | Yellow Time (s) | 3.5 | 3.5 - | - 3.5 | 3.5 | - | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | - | - | | | | | |
| æ | @ Zone: | | IMP | | All-Red Time (s) | 2.5 | 2.5 - | - 25 | 2.5 | - | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | - | - | | | | | |
| | @ X East [It]: | | 229190 | | Lost Time Adjust (s) | 0.0 | 0.0 - | - 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | - | | | | | |
| | @ Y North [It]: | | 188788 | | Lagging Phase? Allow Load lage Optimize? | - | | | _ | - | | | | <u> </u> | | | - | - | | | | | |
| | | | 0 | | Allow Lead/Lag Uptmize? | News | | | News | - | Nana | <u> </u> | CH | Nana | CH | CM | - | - | | | | | |
| | @ Description | | Antid Cound | | Recal Mode | None | None - | None | None | _ | None | L-Max | C-Max | None | U-Max | C-Max | | | | | | | |
| | Cucle Length (a) | | 140.0 | | Actuated Effet Green (s) | 20.0 | 20 - | 20.0 | 20 | _ | 91.2 | 02.0 | 02.0 | 91 C | 92.1 | 02.1 | _ | | | | | | |
| | Cycle Lenger (s) | | 140.0 | | Actuated c/C Batio | 0.21 | 0.21 | 0.21 | 0.21 | | 0.65 | 0.59 | 0.59 | 0.65 | 0.59 | 0.59 | | | | | | | |
| | Optimize Cucle I | enath | Optimize | | Volume to Canacity Batio | 0.47 | 0.21 | - 0.91 | 0.21 | _ | 0.00 | 0.35 | 0.33 | 0.59 | 0.33 | 0.33 | _ | _ | | | | | |
| | Optimize Splits: | | Optimize | | Control Delay [s] | 52.3 | 10.6 - | - 91.0 | 11.7 | _ | 40.6 | 21.1 | 42 | 33.4 | 10.9 | 22 | - | _ | | | | | |
| | Actuated Cyclef | st | 140.0 | | Queue Delay (s) | 0.0 | 0.0 - | - 0.0 | 0.0 | _ | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | _ | _ | | | | | |
| | Natural Cycle(s): | -,- | 80.0 | | Total Delay (s) | 52.3 | 10.6 - | - 91.0 | 11.7 | - | 40.6 | 21.1 | 4.2 | 33.4 | 11.0 | 2.2 | - | - | | | | | |
| | Max v/c Ratio: | | 0.91 | | Level of Service | D | в – | - F | В | _ | D | C | A | C | В | A | _ | _ | | | | | |
| | Intersection Dela | ay (s); | 21.0 | | Approach Delay (s) | - | 30.6 - | | 68.2 | - | - | 21.1 | - | - | 11.9 | - | - | — | | | | | |
| | Intersection LOS | i: | C | | Approach LOS | - | C – | | E | - | - | C | - | - | В | - | | - | | | | | |
| | ICU: | | 0.81 | | Queue Length 50th (ft) | 110 | 11 - | - 195 | 7 | - | 38 | 446 | 11 | 49 | 212 | 4 | - | - | | | | | |
| 1 | ICU LOS: | | D | | Queue Length 95th (ft) | 141 | 39 - | - #319 | 52 | | 109 | 630 | 23 | m67 | m227 | m5 | | — | | | | | |
| | Offset (s): | | 130.0 | | Stops (vph) | 89 | 20 – | - 186 | 16 | - | 84 | 1066 | 26 | 90 | 407 | 11 | - | - | | | | | |
| | Referenced to: | | Begin of Green | | Fuel Used (g/hr) | 2 | 1 – | - 5 | 1 | | 2 | 26 | 1 | 2 | 14 | 0 | | — | | | | | |
| | O Deference Phase | ~ | 2.C NETI CETI | ~ | | | | | | | | | | | | | | | | | | | ~ |
| | ▶ø1 | | Tø2 (R) | | | | | | | | | | | | | P Ø4 | | | | | | _ | |
| | 16 s | 83 | s | | | | | | | | | | | | 41 s | | | | | | | | |
| | ↑ø5 | | Ø6 (R) | | | | | | | | | | | | 1 | Ø8 | | | | | | | |
| | 16 s | 83 | s | | | | | | | | | | | | 41 s | | | | | | | | |
| Mini | mum Initial Green Tin | ne, also called Mir | nimum Green Time | | | | | | | | | | | | | | | | | | v/c ok | . F | vins ok |

- 1. First screen shot is PM with existing volumes and existing splits (assuming max 140s cycle):
 - a. 100s split for M-150
 - b. 40s split for driveway
 - c. Note natural cycle length is 60s
- 2. Second screen shot is PM with future volumes and existing splits (assuming max 140s cycle):
 - a. 100s split for M-150
 - b. 40 split for driveways
 - c. Note natural cycle length remains 60s
 - d. EB approach goes from C to D
 - e. WB approach goes from E to F
 - f. NBLT goes from A to E
- 3. Third screen shot is PM with future volumes and improvements including N/S left turn phasing, a SBRT lane, and proposed splits (assuming max 140s cycle):
 - a. 85 to 88s split for M-150
 - b. 38s split for driveways
 - c. 14 to 17s for S/N Left turn phase
 - d. Note natural cycle length is 75s
 - e. EB approach remains D
 - f. WB approach goes from F to E (Not sure and we believe this result since they took 2s split time away)
 - g. NBLT goes from E to C
 - h. SB M150 goes from A to B

| • | ► E C C | ↑ / = | | | | Synchro | 11 - C:\U | lsers\ (| 10-19-22)\ | Chick-fil- | A Roche | ster TIS.syn | (read-or | nly) | | | | | | | æ. | | × |
|--------|---------------------------------------|-------------------------------|-----------------------|----------|---|-----------------------------|-----------|-----------------------------------|------------------------------|------------|-----------------|--------------|---------------|---|--|----------|-----------------|------------------|----------------------------------|-------------|----------------|----------|---------|
| | ile Home | Options | Transfer Opti | nize | Reports Help | | | | Existir | ng PM 👻 | | | | | | | | | | | 📕 Þ 🛛 | 0: 0: 0, | / 0:0:0 |
| | ap 🕜 🗙 🖄 | भ ९ ९ ३ प ९ | View Ports | 에 1구 | Lane Settings Merge Templat W Volume Setting Templates VI | te js Timir Settir | ф ## | Template Ring & E Cluster E | e * 🔥 Barrier Editor 🌋 | Phasing S | Settings | 41 * | HCM 6th Ed | 1 + In ^d + M <u>∧</u> Re | t. Results Ivmt Resul eset Warni | ts + | 2010 . | hnt. Res Mvmt | sults * Results * Varnings | 12 12 | Link × | | |
| | Mapping 🛛 🛱 | Zoom | View Options | | Lanes & Volumes | | | Signa | al Timing | | | Detection | 1 | HCM 6t | h Edition | | | HCM 2010 | D | Simulation | n Display Resu | ts | ^ |
| BIN | × 🕅 🔴 🕇 | • • • • | | | | | | | | | | | | | 2 | Rocheste | r Road (| M-150) & | Site Drive | /Meijer-Low | e's Drive | | |
| IG SCE | NODE SET | TTINGS | | î | TIMING SETTINGS | EBL | → EBT | EBR | WBL | ← WBT | ♦ WBR | NBL | ↑ NBT | ▶ NBR | SBL | ↓ SBT | √ SBR | AA PED | HOLD | | | | ^ |
| NA | @ Node # | | 2 | | Minimum Initial (s) | 7.0 | 7.0 | | 7.0 | 7.0 | - | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | - | - | - | | | | |
| RIO | @ ATMS.now Contr | roller ID | | | Minimum Split (s) | 13.0 | 13.0 | | 13.0 | 13.0 | - | 16.3 | 16.3 | 16.3 | 16.3 | 16.3 | - | - | - | | | | |
| MA | Import from ATMS | S.now: | Import | | Total Split (s) | 40.0 | 40.0 | - | 40.0 | 40.0 | - | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | - | - | - | | | | |
| NA | Export to ATMS.r | now: | Export | 11 | Yellow Time (s) | 3.5 | 3.5 | - | 3.5 | 3.5 | - | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | - | - | - | | | | |
| SER | @ Zone: | | / | | All-Red Time (s) | 2.5 | 2.5 | - | 2.5 | 2.5 | - | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | - | - | - | | | | |
| | ∞ X East (ft): | | 22919 | | Lost Time Adjust (s) | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | | | | |
| | @ Y North (ft): | | 18878 | | Lagging Phase? | - | - | - | | - | - | — | - | - | - | - | - | - | - | | | | |
| | Ø Z Elevation (ft): | | | | Allow Lead/Lag Optimize? | - | - | | | - | - | - | - | - | - | - | - | - | - | | | | |
| | @ Description | | | | Recall Mode | None | None | - | None | None | - | C-Max | C-Max | C-Max | C-Max | C-Max | - | - | - | | | | |
| | Control Type | | Actd-Coord | | Speed limit (mph) | - | 25 | - | - | 25 | - | - | 50 | - | - | 50 | - | - | - | | | | |
| | Cycle Length (s): | | 140.0 | | Actuated Effct. Green (s) | 20.4 | 20.4 | - | 20.4 | 20.4 | - | 107.3 | 107.3 | 107.3 | 107.3 | 107.3 | - | - | - | | | | |
| | Lock Timings: | | | | Actuated g/C Ratio | 0.15 | 0.15 | - | 0.15 | 0.15 | - | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | - | - | - | | | | |
| | Optimize Cycle Le | ength: | Optimize | | Volume to Capacity Ratio | 0.04 | 0.05 | _ | 0.74 | 0.25 | - | 0.05 | 0.59 | 0.07 | 0.42 | 0.58 | - | - | _ | | | | |
| | Optimize Splits: | | Optimize | 11 | Control Delay (s) | 48.0 | 23.8 | | 76.7 | 28.5 | - | 6.2 | 10.5 | 2.2 | 7.5 | 2.7 | - | - | - | | | | |
| | Actuated Cycle(s | ;); | 140.1 | | Queue Delay (s) | 0.0 | 0.0 | _ | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | - | - | - | | | | |
| | Natural Cycle(s): | | 60.1 | | Total Delay (s) | 48.0 | 23.8 | - | 76.7 | 28.5 | - | 6.2 | 10.5 | 2.2 | 7.5 | 2.9 | - | - | - | | | | |
| | Max v/c Ratio: | | 0.7 | | Level of Service | D | C | _ | E | C | - | A | В | A | A | A | _ | - | — | | | | |
| | Intersection Dela | ĥ (s): | 10.3 | | Approach Delay (s) | - | 32.6 | | | 62.2 | - | - | 10.1 | - | - | 3.1 | - | - | - | | | | |
| | Intersection LOS: | : | 1 | | Approach LOS | - | C | - | | E | - | - | В | - | - | A | _ | - | - | | | | |
| | 0 ICU: | | 0.7 | | Queue Length 50th (It) | 6 | 2 | | 141 | 26 | - | 2 | 431 | | 6 | 80 | - | - | - | | | | |
| | O ICU LOS: | | | | Queue Length 95th (It) | 14 | 11 | _ | 209 | 68 | - | m4 | 518 | 18 | m9 | m95 | _ | - | _ | | | | |
| | Olfset [s]: | | 1.0 | 4 | O Stops (vph) | 5 | 3 | | 136 | 27 | - | 3 | 1001 | 9 | 8 | 152 | - | - | - | | | | - 10 |
| | Referenced to: | | Begin of Green | . | Fuel Used (g/hr) | 0 | 0 | _ | 3 | 1 | - | 0 | 22 | 0 | 0 | 7 | - | - | - | | | | ~ |
| | Ø2 (R) | a: | | | | | | | | | | | | | | 40 | ≜ ∎04 s | | | | | | |
| | ▼ 7Ø6 (R) | | | _ | | | | | | | | | | | | 40 | / Ø8 | | | | | _ | |
| Roc | hester Road (M-150) | & Site Drive/Mei | jer-Lowe's Drive (229 | 190 | 188788) | | | | | | | | | | | - | 2 | | | | v/0 | ok | Mins ok |

| ۰ | ▶□記録』→ | e = | | | | Synchro | 11 - C:\Users\ (| (10-19-22)\ | Chick-fil- | A Roche | ster TIS.syr | ı (read-on | nly) | | | | | | | æ | _ | | × |
|--------|--|--------------------|----------------------|----------|---|-------------------|---|---|------------|----------|----------------|---------------|----------------------------------|---|------------------|-----------------|-------------------------------|---------------------------------------|-------------|-----------------------------|--------|-----------|---------|
| F | File Home Opt | tions | Transfer Optir | mize | Reports Help | | Future PN | M - Openin | g Day (10 | % Pass-E | | | | | | | | | | | |): 0: 0 / | 0: 0: 0 |
| M | ap ● × @ Q Mapping 5 Z | Q Q C Q Zoom | View Ports | 91 17 | Lane Settings Merge Template Templates ???? TIA Lanes & Volumes | t Timir Settin | ∳ Templat ∰ Ring & I Igs St Cluster I Sign | e 🎽 🔥 Barrier Editor 🛣 al Timing | Phasing S | Settings | M Setection | HCM 6th Ed | I + In I ↑ M A R HCM 6t | t. Results Ivmt Resul eset Warni h Edition | * ts * ngs | 2010 . | ⊢ Int. Res Mvmt Reset V | sults * Results * Varnings 0 | Simulation | Link O U Display R | esults | | ~ |
| 비 | × 🔳 🗕 🔶 🔶 | - + + | 1 | | | | | | | | | | | 2 | Rocheste | r Road (| M-150) & | Site Drive | /Meijer-Low | a's Drive | | | |
| NG SCE | NODE SETTING | āS | | î | TIMING SETTINGS | EBL | EBT EBR | √ ₩BL | ← WBT | WBR | NBL | 1 NBT | ▶ NBR | SBL | ↓ SBT | √ SBR | HA PED | HOLD | | | | | ^ |
| NAR | @ Node # | | 2 | 2 | Minimum Initial (s) | 7.0 | 7.0 - | - 7.0 | 7.0 | - | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | - | - | - | | | | | |
| N OI | @ ATMS.now Controller IE | D | lunat | | Minimum Split (s) Minimum In | itial Green | Time, also calle | d Minimun | n Green Ti | me - | 16.3 | 16.3 | 16.3 | 16.3 | 16.3 | - | - | - | | | | | |
| AN | C Import from ATMS.now. | v. | Export | | Yellow Time (s) | 40.0 | 35 | 40.0 | 40.0 | _ | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | _ | _ | | | | | | |
| AGE | @ Zone: | | Lapon | | Al-Bed Time (s) | 25 | 25 - | - 25 | 2.5 | _ | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | _ | _ | _ | | | | | |
| R | ∞ XEast (ft): | | 229190 | | Lost Time Adjust (s) | 0.0 | 0.0 - | - 0.0 | 0.0 | _ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | | | | | |
| | @ Y North (ft): | | 188788 | в | Lagging Phase? | - | | | - | _ | - | - | _ | - | _ | _ | - | _ | | | | | |
| | @ Z Elevation (it): | | (| D | Allow Lead/Lag Optimize? | - | | | - | - | - | - | - | - | - | - | - | - | | | | | |
| | @ Description | | | 1 | Recall Mode | None | None - | None | None | | C-Max | C-Max | C-Max | C-Max | C-Max | | | - | | | | | |
| | Control Type | | Actd-Coord | 8 | Speed limit (mph) | - | 25 — | | 25 | - | - | 50 | - | - | 50 | - | - | - | | | | | |
| | Cycle Length (s): | | 140.0 | D | Actuated Effct. Green (s) | 25.8 | 25.8 - | - 25.8 | 25.8 | | 101.9 | 101.9 | 101.9 | 101.9 | 101.9 | | | _ | | | | | |
| | Lock Timings: | | | | Actuated g/C Ratio | 0.18 | 0.18 - | 0.18 | 0.18 | - | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | - | - | - | | | | | |
| | Optimize Cycle Length: | c | Optimize | | Volume to Capacity Ratio | 0.55 | 0.51 - | - 0.93 | 0.23 | | 0.83 | 0.63 | 0.08 | 0.51 | 0.65 | | | - | | | | | |
| | Optimize Splits: | | Optimize | | Control Delay (s) | 58.6 | 43.9 - | - 105.7 | 28.7 | - | 62.4 | 13.9 | 2.5 | 12.2 | 3.6 | - | - | - | | | | | |
| | Actuated Cycle(s): | | 140.0 | D | Queue Delay (s) | 0.0 | 0.0 - | - 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | — | - | - | | | | | |
| | Natural Cycle(s): | | 60.0 | | Total Delay (s) | 58.6 | 43.9 - | - 105.7 | 28.7 | - | 62.4 | 13.9 | 2.5 | 12.2 | 4.1 | - | - | - | | | | | |
| | Max v/c Ratio: | | 0.93 | 3 | Level of Service | E | D – | - F | C | - | E | В | A | В | A | - | - | - | | | | | |
| | Intersection Delay (s): | | 17.3 | 2 | Approach Delay (s) | - | 50.5 - | | 80.7 | - | - | 16.0 | - | - | 4.4 | - | - | - | | | | | |
| | Intersection LOS: | | E | 3 | Approach LOS | - | D – | | F | - | - | В | - | - | A | - | - | - | | | | | |
| | ICU: | | 0.82 | 2 | Queue Length 50th (ft) | 119 | 115 - | - 146 | 35 | - | 88 | 566 | 7 | 7 | 97 | - | - | - | | | | | |
| | ICU LOS: | | E | | Queue Length 95th (tt) | 113 | 102 - | - #237 | - 11 | - | m#213 | 696 | m17 | m9 | m105 | - | - | - | | | | | |
| | Offset [s]: | | 1.0 | | Stops (vph) | 76 | 73 - | - 141 | 34 | - | 73 | 1170 | 9 | 12 | 176 | - | - | - | | | | | |
| | Referenced to: Deferenced to: | | Begin of Green | ~ | Fuel Used (g/hr) | 2 | 1 - | - 4 | 1 | - | 3 | 26 | U | 1 | 8 | - | - | - | | | | | ~ |
| | | | | - | | | | | | | | | | | | A | | | | | | | |
| | 100 s | | | | | | | | | | | | | | 40 | -104 | | | | | | | |
| | No. 1 | | | | | | | | | | | | | | - | - | | | | | | | |
| | ▼ ~ Ø6 (R) 100 s | | | | | | | | | _ | | | | | 40 | V Ø8 | | | | | | | |
| Roc | hester Road (M-150) & Site | e Drive/Meij | er-Lowe's Drive (229 | 9190 | 188788) | | | | | | | | | | | | | | | | v/c ok | _ | Mins ok |

| ٠ | s 8 8 | *) (*) = | | | | Syn | chro 11 | I - C:\Users\ | 9-22)\Chick | -fil-A Roo | hester Ti: | S - IMP.syr | n (read-or | nly) | | | | | | | I | æ - | | × |
|------|---------------------------------------|------------------------|----------------------|----------|--|----------------|---------|----------------------|----------------------|-----------------|------------|-------------|---------------|-----------------|-------------------------|------------|--------------|---------------------|----------------------|-------------|------------|---------|---------|---------|
| F | ile Home | Options | Transfer Optir | mize | e Reports Help | | | Future PM | - Opening [| ay (10%) | Pass-By) | - IMP 👻 | | | | | | | | | | ⊳ ш | 0: 0: 0 | 0/0:0:0 |
| M | | भ ् ् (द्व ् | View Ports | 9월 1구 | Lane Settings 🏶 Merge Temp W Volume Sett Templates 👻 🕫 TIA | plate tings | Timing | ∲ Templa ∰ Ring 8 | ate * 👪 L Barrier | Phasing TSD | Settings | ₩ * | HCM 6th Ed | 1 + In 1 + M | t. Results Ivmt Resu | * Its * | 2010 | - Int. Re • Mvmt | sults * Results * | 명 () | | ink • | | |
| Vie | W Manning D | Zoom | View Options | | Lanes & Volumes | | Setting | s Sin | nal Timing | | | Detection | | HCM 6H | h Edition | ings | 4 | JCM 201 | 0 | Simulat | ion Dirn | ny Peru | 1.0 | ~ |
| | | | | | carles or volumes | | | Sig | nar nining | | | Detection | | ricivi de | 2 | Pocherte | r Road (I | 4-150) 8 | Cite Drive | /Maiiar-L | on Disp | ay Nesu | | |
| NG . | × 📖 🗕 - | • • • • | | | | | | | | | | | | | 2 | Nocriesu | er Koau (i | vi-150) d | Site Drive | / Weijer-ci | owe s Driv | c | | |
| SCE | NODE SE | TTINGS | | î | TIMING SETTINGS | E | ► BL | EBT EBR | √ ₩BL | ← WBT | WBR | NBL | 1 NBT | ▶ NBR | SBL | ↓ SBT | SBR | AL PED | HOLD | | | | | ^ |
| NAF | @ Node # | | 2 | 2 | Minimum Initial (s) | | 7.0 | 7.0 | - 7.0 | 7.0 | - | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | - | — | | | | | |
| ő | @ ATMS.now Con | troller ID | (| 9 | Minimum Split (s) | _ | 13.0 | 13.0 | - 13.0 | 13.0 | - | 11.3 | 16.3 | 16.3 | 11.3 | 16.3 | 16.3 | - | - | | | | | |
| A | Import from ATM | S.now: | Import | 4 | Total Split (s) | | 38.0 | 38.0 | - 38.0 | 38.0 | - | 17.0 | 88.0 | 88.0 | 14.0 | 85.0 | 85.0 | - | | | | | | |
| AG | Export to ATMS. | now: | Export | | Yellow Time (s) | _ | 3.5 | 3.5 | - 3.5 | 3.5 | - | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | - | - | | | | | |
| 5 | @ ∠one: | | 1MF | | All-Hed Time (s) | | 2.5 | 2.5 | - 2.5 | 2.5 | | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | _ | _ | | | | | |
| | 40 X Edst (it): | | 19979 | 0 | Clost Time Adjust (s) | | 0.0 | 0.0 | - 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | |
| | # 7 Flavation (II) | | 10070 | | Allow Lead/Lea Ontimize? | | | | | | | | | | | | | | | | | | | |
| | @ Description | | | - | Recal Mode | | None | None | - None | None | _ | None | C-Max | C-Max | None | C-Max | C-Max | _ | _ | | | | | |
| | Control Type | | Actd-Coord | | Speed limit (mph) | | - | 25 | | 25 | _ | - | 50 | _ | - | 50 | - | _ | _ | | | | | |
| | Cycle Length (s) | : | 140.0 | D | Actuated Effct. Green (s) | | 25.9 | 25.9 | - 25.9 | 25.9 | _ | 98.4 | 91.0 | 91.0 | 93.9 | 87.0 | 87.0 | _ | - | | | | | |
| | Lock Timings: | | | | Actuated g/C Ratio | | 0.18 | 0.18 | - 0.18 | 0.18 | - | 0.70 | 0.65 | 0.65 | 0.67 | 0.62 | 0.62 | - | - | | | | | |
| | Optimize Cycle L | ength: | Optimize | 1 | Volume to Capacity Ratio | | 0.55 | 0.43 | - 0.92 | 0.21 | _ | 0.51 | 0.71 | 0.08 | 0.39 | 0.72 | 0.09 | _ | - | | | | | |
| | Optimize Splits: | | Optimize | 1 | Control Delay (s) | | 58.7 | 20.9 | - 104.2 | 13.6 | - | 24.1 | 16.9 | 3.0 | 18.8 | 10.5 | 1.8 | - | - | | | | | |
| | Actuated Cycle(| s): | 140.0 | D | Queue Delay (s) | | 0.0 | 0.0 | - 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | | - | | | | | |
| | Natural Cycle(s): | | 75.0 | D | Total Delay (s) | | 58.7 | 20.9 | - 104.2 | 13.6 | - | 24.1 | 16.9 | 3.0 | 18.8 | 10.7 | 1.8 | _ | — | | | | | |
| | Max v/c Ratio: | | 0.9 | 2 | Level of Service | | E | C | — F | В | | C | В | A | В | В | A | | — | | | | | |
| | Intersection Dela | ay (s): | 18.0 | В | Approach Delay (s) | | - | 37.7 | | 74.8 | - | - | 16.6 | - | - | 10.5 | - | - | - | | | | | |
| | Intersection LOS | i: | E | 3 | Approach LOS | | - | D | | E | | - | В | - | - | В | | | - | | | | | |
| | ICU: | | 0.77 | 7 | Queue Length 50th (ft) | | 118 | 49 | - 145 | 7 | - | 22 | 653 | 9 | 11 | 212 | 2 | - | - | | | | | |
| | ICU LOS: | | 0 | 2 | Queue Length 95th (ft) | | 115 | 43 | - #249 | 51 | - | m82 | 745 | m20 | m17 | m230 | m3 | - | - | | | | | |
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Future AM Opening Day Improved: They used 140s cycle lengths (first screen shot) even though natural cycle lengths (2nd screen shot) range from 45 to 90s max.

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