

SUMMARY MEMORANDUM

Mr. Kyle Corbeil, P.E.
Project Engineer
Woodard & Curran
One Merchants Plaza
Bangor, ME 04401

May 17, 2016

RE: Traffic Impact Study Review for Hampden Solid Waste Processing Facility

The purpose of this memorandum is to summarize review of the proposed Solid Waste Processing Facility in regard to traffic, as requested by Woodard and Curran and the Town of Hampden. Previously, I reviewed the "Hampden Site Plan Review Application for Solid Waste Processing Facility, Appendix 1, Traffic Narrative," prepared by Victor J. Smith, P.E. and dated June 24, 2015. That review was summarized in my March 25th memorandum to you. In that memorandum I specifically requested additional information which would constitute a typical Traffic Impact Study for this level of trip generation including:

- Peak hour trip generation and assignments for determination of study area
- Traffic volume data for intersections determined to be in the impact area
- Capacity analysis for the study area intersections
- Auxiliary turn lane warrants
- Information on how the trucks would be restricted to the stated haul routes and away from Hampden's intersections of concern
- Site signage and pavement markings
- Sight distance review at the intersection of Main Road North and Coldbrook Road since it was flagged as a concern of the Town.

A Traffic Impact Study was then performed in response to the above requests, also prepared by Victor Smith, P.E. This traffic study was not stamped and signed. It is recommended that a stamped/signed copy of this traffic study be submitted to the Town of Hampden for the record.

Maine Traffic Resources (MTR) began a review of that study and found some deficiencies and errors. Victor Smith called MTR to check on the status of the Traffic Impact Study review and the following was conveyed to Victor Smith:

- There was an error in the seasonal factors utilized which overinflated the traffic volumes.
- Traffic counts and analysis were not provided for the intersection of the I-95 northbound ramps and Coldbrook Road but they were provided for the southbound ramp intersection.
- No information was provided on how trucks would be required to stay to the identified haul routes. In discussion of this item Victor Smith stated that since Route 202 was a

faster and better road, haulers coming from the northeast would take that road and not Main Road North (Route 1A). MTR suggested travel time runs to document/demonstrate that Route 202 would be the preferred route since it was faster.

- Sight distance for the intersection of Main Road and Coldbrook Road was not provided.

An addendum, Traffic Impact Study Addendum 1, prepared by Victor Smith was submitted to MTR on May 9th for review. This Traffic Impact Study Addendum was also not stamped and signed by Victor Smith. Again, a stamped and signed copy should be submitted to the Town of Hampden for the record. My review comments on the Traffic Impact Study and Traffic Impact Study Addendum 1 follow:

1. **Peak Hour Trip Generation.** I concur with the peak hour trip generation estimates obtained and utilized in the study. These were obtained by converting daily trips to peak hour trips based upon the hourly distributions recorded at the existing PERC facility in Orrington and projected employee shift times.
2. **Peak Hour Trip Assignments.** I generally concur with the trip assignments, which are based upon the expected haul routes. Based upon the trip assignments the study area extends from the site along Coldbrook to the I-95 southbound ramps. The trip assignments to and from the east along Coldbrook Road, through the Route 202 intersection, are borderline for inclusion in the study area for capacity purposes. Given that this intersection has been designed to a high standard with auxiliary turn lanes, MTR did not feel it necessary to include traffic counts or analysis for this intersection.
3. **Traffic Volumes.** Based upon the trip assignments and determined study area, traffic counts were conducted at the Coldbrook Road intersections of the site drive, the I-95 north bound ramps and the I-95 southbound ramps. MTR found an error in the original Traffic Impact Study. The counts had been factored by a 1.20 factor to peak summer conditions. The actual factor is only 1.08 and this was subsequently corrected in Addendum 1.
4. **Annual Traffic Growth.** MTR concurs with the 2 % annual traffic growth used to bring the 2016 volumes to base 2018 conditions.
5. **Other Development Volumes.** The study never discusses whether the Town of Hampden was contacted to determine if there are any other development projects, either approved and not yet built, or pending approval, that should be considered in the traffic analysis. The Town of Hampden and/or Victor Smith should confirm that there are no other development projects in the area which will impact future study area volumes. If any significant other development projects are identified then the no-build and build analyses should be updated to include traffic from these developments.
6. **Traffic Analysis.** Level of service (LOS) analysis was performed for existing conditions, 2018 no-build (assuming no other development projects) and build conditions for the study area intersections for the AM and PM peak hours of the facility. The results indicate that

there are no capacity concerns at either the Coldbrook Road northbound ramp intersection or the site drive intersection during these AM and PM peak hours of the facility. The build condition for the site drive was run with a right-turn lane on Coldbrook Road to serve the facility. Since no right-turn lane is being provided the analysis should be re-run and resubmitted without the right-turn lane.

The analysis determined that the intersection of the southbound I-95 off-ramps and Coldbrook Road operates at capacity, LOS $\delta E\delta$, under existing conditions. Under projected no-build and build volumes the LOS will be $\delta F\delta$. Mr. Smith notes that this LOS $\delta F\delta$ condition only occurs for 15 minutes of the peak hour. Typically, over time, the LOS $\delta F\delta$ condition will worsen and given daily and seasonal traffic fluctuations it may impact a greater portion of the peak hour. He also suggests that the intersection is not of concern since it is not a high crash location. While Mr. Smith is correct that poor levels of service can ultimately lead to accident problems, this would not be expected to occur yet at an intersection that is currently operating at LOS $\delta E\delta$. Generally, accident problems don't occur until an intersection has been operating at LOS $\delta F\delta$ for some time.

Since the peak hour of the adjacent street system occurs later than the peak hour for the facility it is recommended that the analysis for the southbound ramp intersection also be performed for the peak hours of the adjacent street system to determine operations during that period. While the facility will generate fewer trips during this period other volumes will be higher. Generally, both AM and PM peaks occur in close proximity and there is not much difference in results. Typically, when MTR performs traffic analysis we are conservative in our assumptions. For example, MTR would have laid the AM trip generation for the site (6:30 δ 7:30 AM) over the AM peak hour of the adjacent street (7:00 δ 8:00 AM). This allows for the facility to shift their hours and allows for the analysis to consider daily and seasonal variations in hour traffic volumes. Similarly, the PM peak hour of the adjacent street is 4:15 to 5:15 PM while the peak hour of the facility is 2:30 δ 3:30 PM.

Typically, when a deficiency is identified in a study, potential mitigation actions are evaluated. Mr. Smith has recommended that MaineDOT restripe the off-ramp to clearly define 300 feet of separate left and right-turn lanes. Maine Traffic Resources recommends that traffic signal warrants also be evaluated for the southbound off ramp intersection. If traffic signal warrants are not met a possible condition of approval would be to monitor the off ramp intersection after the solid waste facility is fully occupied.

To summarize, MTR requests that analysis also be performed for the AM and PM peak hours of the adjacent street system for the intersection of Coldbrook Road and the I-95 southbound ramps since capacity concerns were identified. Traffic signal warrant analysis should also be provided for this intersection under projected build conditions. The analysis for the site drive under build conditions should be repeated with corrected lane inputs on Coldbrook Road.

7. **Auxiliary Turn-Lane Warrants.** Auxiliary turn-lane warrants were provided for Coldbrook Road at the site drive to determine the need for either a right-turn lane or a left-turn lane to serve traffic entering the site. The results show that neither a right-turn lane nor left-turn lane are warranted on Coldbrook Road at the site drive during the peak hours of the facility.
8. **Accident Data:** Additional accident data was obtained for an expanded study area for safety purposes, from the I-95 southbound ramps to the intersection of Route 202 and then along Route 202. There are no high crash locations, meeting both MaineDOT crash criteria. There was one location which is approaching the high crash criteria, the intersection of Route 202 and Western Avenue. This intersection has a CRF of 0.93 with 18 reported crashes. Mr. Smith indicates that the vast majority of accidents are rear-end collisions and simply due to inattention. In fact, rear-end collisions at signalized intersections can often be attributed to improper traffic signal timing. Further evaluation of safety and signal timings is recommended for this intersection.
9. **Haul Routes:** In my initial review, MTR asked how haul routes to the facility will be mandated. In further discussion with Victor Smith travel-time runs were suggested to demonstrate that trucks would utilize Route 202 and not North Main Street to travel to the facility. No data regarding haul route adherence or travel time runs to support the assumptions were provided in either the Traffic Impact Study or the Addendum 1. Additional information is needed to address these concerns of the Town.

As noted in my initial review, the Town of Hampden is concerned with trucks at three particular intersections in the vicinity of the facility, which could indeed be impacted by trucks using the shortest, most direct route. These intersections are:

Main Road North (Route 1A) and Western Avenue
Western Avenue and Route 202
Coldbrook Road and Main Road North (Route 1A)

Additional information indicating how haul routes are to be mandated or travel time runs to demonstrate no significant truck impact to these intersections should be provided.

In addition, sight distance was specifically requested for the intersection of Main Road North and Coldbrook Road, which was not provided in either the study or addendum.

10. **Interior Road Network:** The updated site plan (C102 and C103) were reviewed regarding previous comments. A stop sign has been added exiting the facility at the cul-de-sac. Some radii revisions were made to the site plan to better accommodate WB-67 trucks entering the facility. WB-67 trucks exiting the facility will still need to encroach onto the incoming travel lane. Is a stop sign and stop bar proposed at Coldbrook Road? None is shown on the plan. Will centerline markings be provided on the access drive to better travel paths?

To summarize, Maine Traffic Resources requests the following additional information:

- It should be confirmed that there is no other development pending that needs to be considered in the future traffic analysis.
- LOS for the site drive intersection for build conditions without a right-turn lane on Coldbrook Road since none is being proposed.
- LOS for the AM and PM peak hours of the adjacent street system for the intersection of the I-95 southbound ramps and Coldbrook Roads.
- Given the poor level of service for the southbound I-95 off-ramp and the high left turning volumes MTR requests traffic signal warrant analysis, including peak hours and four hours, at a minimum, for this intersection.
- The intersection of Route 202 and Western Avenue is approaching the high crash criteria with a CRF of 0.93 and 18 crashes over the three-year study period. Mr. Smith indicates that the vast majority of accidents is rear-end collisions and is simply due to inattention. Rear-end collisions at signalized intersections can often be attributed to improper traffic signal timing. Further evaluation of safety and signal timings is recommended for this intersection.
- Additional signage and pavement markings should be shown on the plan.
- Additional information on how haul routes are to be mandated or travel time data to demonstrate that the intersections of concern won't be significantly impacted by trucks.
- Stamped and signed copies of the traffic study and addendums should be submitted to the Town for the record.

As always, if you or the Town of Hampden have any questions regarding these review comments or requests for additional information please do not hesitate to contact me.

Sincerely,



Diane W. Morabito, P.E. PTOE
President

