

March 13, 2018

Amanda L. Stearns  
Land Use Policy Specialist  
Town of Falmouth  
271 Falmouth Road  
Falmouth, ME 04105

Subject: Homestead Farms Contract Zone Traffic Peer Review – Status Comments

Dear Amanda:

The Following is a status update of my November 3, 2017 comments based upon a response to comments letter prepared by Sebago Technics dated December 5, 2017.

1. The project is estimated to generate 142 vehicles entering and exiting during the Weekday AM peak hour and 159 vehicles entering and exiting during the Weekday PM peak hour. The estimate was based upon data from the publication Trip Generation, Institute of Transportation Engineers. I find the estimate and methods to be reasonable.

**Status: I would note that MaineDOT requires use of the 7<sup>th</sup> Edition of the Trip Generation Manual. A newer edition is available (the 10<sup>th</sup> Edition), but in my professional opinion, the results would not change significantly. I have no further comment.**

2. The projected trip generation estimate would require a MaineDOT Traffic Movement Permit.

**Status: I would note that it is recommended that a Traffic Movement Permit be obtained for the entire project at the time of the initial build-out phasing application.**

3. The Traffic Study intersection analysis was based upon traffic counts conducted in 2014. For the purposes of the Contract Zone analysis, I find the 2014 data to be acceptable. I would note that traffic counts would likely need to be updated in conjunction with the MaineDOT Traffic Movement Permit.

**Status: In my professional opinion, I do not believe updated traffic counts would significantly alter the conclusions of the Contract Zone traffic analysis. A detailed updated traffic analysis would be required at the time of the Traffic Movement Permit, and that process would include new traffic volumes. The Applicant conducted an analysis based upon increasing the 2014 traffic volumes by 1% per year to the year 2022 (estimated build-out horizon). The Route 100 Vision Plan assumed the following for expected growth between 2014 and 2035:**

*Future traffic volumes at the study intersections were estimated according to growth assumptions contained in the Portland Area Comprehensive Transportation System (PACTS) travel demand model. According to the PACTS model, the following growth rates are expected for two-way peak hour volumes. As noted growth rates are near 1% annually.*

- **MTA Exit 53 – 24%**
- **Route 100**
  - *South of MTA Exit 53/West Falmouth Crossing – 15%*
  - *South of Leighton Road – 18%*
  - *South of Mountain Road/Falmouth Road – 16%*
  - *North of Mountain Road/Falmouth Road – 13%*
- **Leighton Road**
  - *West of Route 100 – 18%*
  - *East of Route 100 – 17%*
- **Mountain Road**
  - *West of Route 100 – 16%*
- **Falmouth Road**
  - *East of Route 100 – 19%*

**In addition, a review of Maine Turnpike Authority information indicates the MTA has used a peak hour future growth rate of approximately 1.6% annually. Although slightly higher than that used in the Applicant's Study, I do not believe the conclusions would change significantly. I would also note that the Route 100/26 Design Project used a 1% annual growth rate.**

4. Trip distribution for site trips was based upon existing traffic volume information and I find it to be reasonable.

**Status: I have no further comment.**

5. A capacity analysis was conducted at the Gray Road/MTA Exit 53/Hannaford, Gray Road/Leighton Road, Gray Road/Mountain Road/Falmouth Road intersections. The following summarizes my specific comments:

- Gray Road/MTA Exit 53/Hannaford – This intersection is projected to operate at acceptable overall levels of service with the northbound Gray Road approach operating poorly during the PM peak hour (both with and without the proposed project). This location would be included in a MaineDOT Traffic Movement Permit study and would likely be required to investigate mitigation strategies to address the substandard level of service conclusion noted in the analysis. The Town could either wait for the TMP process to take place or seek an understanding of possible mitigation improvements at this time for contact zone approval considerations.

**Status: The Applicant has conducted a revised analysis assuming the traffic signal phasing and timing is optimized. Based upon the revised analysis, acceptable operating conditions are projected following project build-out. The analysis indicates no mitigation is required (other than signal optimization), although refined analyses will be required during the Traffic Movement Permit process. I have no further comment.**

- Gray Road/Leighton Road – This intersection is projected to have failing levels of service, both with and without the proposed project, and with the proposed Route 100 improvements. Similar to the previous intersection, this location would be included in a MaineDOT Traffic Movement Permit study and mitigation strategies would need to be considered. I would note that the level of service conclusions are based upon a traffic signal timing plan that is not optimized. The applicant should revise the analysis to optimize signal timing. If the outcome of the optimization is continued substandard levels of service, the Town could either wait for the TMP process to take place or gain an understanding of improvements at this time. My suggestion would be for the Town to determine if any additional improvements above the Route 100 Design would be appropriate.

**Status: The assumptions used in the analysis vary between Homestead Study and the Route 100/26 Design Project. The following table presents the future volumes for both projects.**

<b>Route 100/Leighton Road Peak Hour Traffic Volumes</b>				
<b>Movement</b>	<b>2037 Design Hour Volumes Design Project</b>		<b>2022 Build Volumes Homestead Traffic Study</b>	
	<b>AM</b>	<b>PM</b>	<b>AM</b>	<b>PM</b>
<b>RT.100 NBL</b>	<b>48</b>	<b>183</b>	<b>47</b>	<b>177</b>
<b>RT.100 NBT</b>	<b>196</b>	<b>851</b>	<b>218</b>	<b>894</b>
<b>RT.100 NBR</b>	<b>71</b>	<b>120</b>	<b>68</b>	<b>116</b>
<b>RT.100 SBL</b>	<b>41</b>	<b>24</b>	<b>39</b>	<b>23</b>
<b>RT.100 SBT</b>	<b>772</b>	<b>306</b>	<b>821</b>	<b>339</b>
<b>RT.100 SBR</b>	<b>29</b>	<b>23</b>	<b>31</b>	<b>24</b>
<b>Leighton EBL</b>	<b>15</b>	<b>52</b>	<b>16</b>	<b>53</b>
<b>Leighton EBT</b>	<b>189</b>	<b>126</b>	<b>183</b>	<b>121</b>
<b>Leighton EBR</b>	<b>152</b>	<b>85</b>	<b>147</b>	<b>82</b>
<b>Leighton WBL</b>	<b>119</b>	<b>76</b>	<b>115</b>	<b>73</b>
<b>Leighton WBT</b>	<b>88</b>	<b>143</b>	<b>84</b>	<b>138</b>
<b>Leighton WBR</b>	<b>10</b>	<b>28</b>	<b>10</b>	<b>27</b>

**The following tables present the results of the level of service analysis for both projects.**

## Route 100/26 Design Project

**Design Year – 2037 – Route 100/26 & Leighton Road  
AM (PM)**

NO BUILD					BUILD			
Movement	LOS	Delay (s/veh)	Average Queue (ft)	95% Queue (ft)	LOS	Delay (s/veh)	Average Queue (ft)	95% Queue (ft)
Route 100 NB Left	C(E)	33.3 (64.6)	29(104)	72(180)	C(A)	33.4(7.0)	35(86)	88(167)
Route 100 NB Thru	A(C)	8.0(24.8)	71(704)	142 (1418)	B(D)	14.6(35.1)	77(510)	164 (1080)
Route 100 NB Right								
Route 100 SB Left	F(B)	87.4 (17.8)	882(292)	1588 (701)	B(C)	16.3(21.3)	37(15)	130(48)
Route 100 SB Through					F(B)	78.9(11.3)	724(80)	1501 (172)
Route 100 SB Right								
Leighton Rd WB Left	D(D)	39.0 (44.1)	206(191)	396 (386)	D(D)	39.0(42.8)	17(41)	80(102)
Leighton Rd WB Thru					F(E)	93.9(58.4)	243(99)	517(186)
Leighton Rd WB Right								
Leighton Rd EB Left	F(D)	143.2 (50.9)	463(283)	1107 (670)	F(E)	156.0 (65.6)	90(62)	174(141)
Leighton Rd EB Thru					C(D)	27.4(40.9)	53(84)	118 (149)
Leighton Rd EB Right								

Homestead Traffic Study

	Gray Road at Leighton Road							
	2022 AM No-Build		2022 AM Build (All PM+PT)		2022PM No-Build		2022 PM Build	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
<i>Leighton Rd EB LT</i>	30	C	71	E	28	C	62	E
<i>Leighton Rd EB TH</i>	36	D	82	F	26	C	69	E
<i>Leighton Rd EB RT</i>	28	C	74	E	15	B	50	D
<i>Leighton Rd WB LT</i>	21	C	52	D	19	B	44	D
<i>Leighton Rd WB TH</i>	16	B	31	C	17	B	48	D
<i>Leighton Rd WB RT</i>	7	A	16	B	14	B	38	D
<i>Gray Rd NB LT</i>	148	F	39	D	128	F	43	D
<i>Gray Rd NB TH</i>	8	A	8	A	125	F	42	D
<i>Gray Rd NB RT</i>	10	A	11	B	119	F	38	D
<i>Gray Rd SB LT</i>	103	F	47	D	98	F	31	C
<i>Gray Rd SB TH</i>	100	F	46	D	12	B	14	B
<i>Gray Rd SB RT</i>	95	F	39	D	9	A	10	B
<i>INTERSECTION</i>	55	D	40	D	83	F	40	D

**Conclusion:** The traffic volumes used in the analyses are very similar for both projects. The key difference is the Homestead Study factored 2014 existing volumes to a 30<sup>th</sup> Highest Hour Condition, while the Route 100/26 Design project used Average Traffic Volumes. Both conclude that there will be some movements that operate at unacceptable levels of service. I would suggest that the Route 100/26 Design project proceed with the intent of meeting left-turn lane storage requirements. Although not ideal, the Homestead project will have to evaluate conditions at the time of the Traffic Movement Permit and may have to implement additional improvements. In my professional opinion additional capacity expansion is not suggested given congestion is limited to a few peak hours during commuter time periods.

- Gray Road/Mountain Road/Falmouth Road – This location is projected to operate at acceptable levels of service following project build-out. I have no further comment.

**Status:** I have no further comment.

6. The applicant should provide vehicle queue estimates for the Gray Road intersections with Leighton Road and Mountain Road/Falmouth Road to ensure the Route 100 Improvement Project will provide adequate turn lane storage lengths following project build-out.

**Status: The Applicant should provide a summary of queue length projections as compared to specific Route 100/26 Design plans and note specifically where inadequate storage will be provided. This should be conducted for both the Homestead Study data and the Route 100/26 Design data.**

7. The Gray Road/Mountain Road/Falmouth Road intersection is classified as a High Crash Location per MaineDOT criteria. The applicant should provide an assessment of current crash patterns to confirm that the proposed Route 100 Improvements will mitigate the identified pattern. The applicant should also provide crash data along Route 100 from MTA Exit 53 through the Leighton Road intersection.

**Status: The Applicant has conducted the requested safety analysis and I concur with their conclusions that improvements should help to mitigate conditions at the Mountain Road/Falmouth Road intersection and signal optimization enhancements should reduce congestion on Route 100 near Exit 53 and thus improve safety. No further action is suggested.**

8. The applicant conducted an analysis of the proposed site driveways with my comments noted below.

- The Gray Road southerly driveway is projected to have failing levels of service, caused by traffic back-ups from the Leighton Road intersection. As noted previously, the applicant shall optimize the signal timing at the Leighton Road intersection, which may reduce blockage of the southerly driveway. A revised analysis should be provided.

**Status: The revised analysis indicates the driveway will not be blocked. I have no further comment.**

- The Gray Road northerly driveway is projected to operate at an acceptable level of service. I have no further comment.

**Status: I have no further comment.**

- The Mountain Road driveway is projected to operate at an acceptable level of service. I have no further comment.

**Status: I have no further comment.**

9. The applicant should clarify if sight distance at the proposed Mountain Road driveway can meet Town standards with vegetation removal.

**Status: The Applicant has noted that acceptable sight distance can be provided with vegetation removal. I have no further comment.**

10. I have reviewed MaineDOT left-turn lane warrants for northbound Gray Road at the site driveways. The methods provided is based upon a roadway with speeds of 40 MPH (the posted speed is 35 MPH – methods are not provided for speeds less than 40 MPH). Based upon my review of traffic volumes provided by the applicant, a left-turn lane is warranted at the northerly driveway. The southerly driveway may warrant a left-turn lane and the applicant should provide an opinion on need. Lastly, the applicant should provide an assessment of storage requirements for left-turn lanes into the project site.

**Status: The applicant notes that both driveways meet warrants for left-turn lanes with a storage requirement of 50 feet. The Town should consider incorporating a left-turn lane at the southerly driveway location.**

11. The applicant should note if single lane approaches to Gray Road are adequate at the site driveways.

**Status: The Applicant has noted adequate operations with single approach lanes and therefore I have no further comment.**

12. The applicant is proposing what appears to be a neighborhood traffic circle at the internal site intersection. I generally support this type of intersection configuration given its traffic calming and safety benefits. I would note that further design details would be required as part of a comprehensive review, particularly if the Town will be maintaining the roadway and for acceptable emergency access and large vehicle maneuvers (buses, delivery trucks, etc.).

**Status: I have no further comment.**

Please contact me if you have any questions.

Best regards,

T.Y. LIN INTERNATIONAL

A handwritten signature in black ink that reads "Thomas A. Errico". The signature is written in a cursive, flowing style.

Thomas A. Errico, PE  
Senior Associate / NE Traffic Engineering Director

