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File:	STN Project No. 192310971	Date:	September 24, 2020

Reference: Norwalk River Valley Trail 'Wil-Walk' Segment – Chipmunk Lane Parking Demand Study

The purpose of this memo is to summarize Stantec's estimate of parking demand for a proposed gravel parking area off Chipmunk Lane in Wilton, Connecticut. The proposed parking area is located along the Norwalk River / US Route 7 corridor as part of the Norwalk River Valley Multi-Purpose Recreational Trail (NRVT). Approximately 3,750 feet (0.71 mile) of trail from Grist Mill Road/Old Belden Hill Road in the City of Norwalk to Kent Road in the Town of Wilton is proposed, with an additional 1,700-foot spur off the existing commuter parking lot on the intersection of Danbury Road (Route 7) and Wolfpit Road. This portion of the trail is located on properties categorized as parcels of conservation significance on the Wilton Land Conservation Trust map. Based on the analysis contained herein, Stantec recommends that a total of 8 parking spaces are provided to accommodate visitors to NRVT's 'Wil-Walk' segment.

PARKING DEMAND ESTIMATE METHODOLOGY

Stantec's methodology to estimate parking demand for the 'Wil-Walk' segment is based upon a review of methodologies developed for studies performed for other facilities. These studies include:

- New New York Bridge (NNYB) Shared Use Path Visitor Parking Demand Study (2014):
https://www.newnybridge.com/documents/sup/Appendix-A_Parking-Demand-Study.pdf
- Salem-Concord Bikeway Demand Estimate Study (2003):
<https://www.nh.gov/dot/programs/bikeped/documents/Salem-ConcordDemandReport.pdf>

This approach was taken given that there is no standard methodology available to estimate parking demand for trail and shared use path facilities from the Connecticut Department of Transportation (CTDOT), the American Association of State Highway Transportation Officials (AASHTO), the National Park Service (NPS), and other agencies and associations. Although the aforementioned studies evaluate different types of demand, the methodologies employed are similar. Stantec performed the following steps to estimate parking demand for NRVT's 'Wil-Walk' segment:

1. Review existing daily trail usage along the NRVT East Loop in Wilton. The East Loop trail usage will be used to estimate usage along the proposed 'Wil-Walk' segment.
2. Estimate average daily trail usage for the proposed NRVT 'Wil-Walk' segment based on an assumed catchment area. This would provide an estimate of daily trail usage along the proposed trail segment.
3. Develop peak hour trail usage for the NRVT 'Wil-Walk' segment using identified automobile modal split and auto occupancy factors. This will provide an estimate of peak hour vehicular demand at the proposed Chipmunk Lane parking area, which would determine the potential number of parking spaces that would be needed to accommodate trail visitors.

Reference: Norwalk River Valley Trail 'Wil-Walk' Segment – Chipmunk Lane Parking Demand Study

COVID-19 Considerations

Stantec reviewed 2019 and 2020 trail count data for the existing segment of the NRV in Wilton (East Loop). A review of the data indicates that trail usage from April 2020 through June 2020 is higher than the comparable period in 2019. For purposes of this analysis, Stantec relied upon daily trail usage from the year 2019¹ (prior to the onset of the COVID-19 pandemic).

It is not recommended to use the 2020 trail usage data for purposes of estimating parking demand. A modern pandemic of this magnitude has never occurred and there are no similar occurrences that engineers can use to meaningfully estimate how long the impacts of the pandemic will last and when multimodal transportation patterns will return to normal. The Connecticut Trail Census released a report in July 2020 which notes the unprecedented changes in trail use because of COVID-19². They have noted some shifts in users from popular trails to less busy trails in response to social distancing requirements. In the case of the NRV 'Wil-Walk' segment, it is unknown at this time whether the increased daily usage along the NRV since the onset of the pandemic will be temporary or permanent.

It should also be noted that, as of April 202, the Connecticut DOT³ has also recommended against collecting new traffic count data given the ongoing COVID-19 pandemic.

REVIEW OF EXISTING DAILY TRAIL USAGE – NRV WILTON EAST LOOP SEGMENT

Stantec reviewed daily trail usage along NRV's existing East Loop segment in Wilton. The East Loop segment begins at the intersection of Route 7 and Wolfpit Road in Wilton and extends approximately two and quarter miles north to just short of Skunk Lane. It is important to note that trail usage is captured with infrared counters and represents the number of times that the infrared counter is passed (also known as uses), which is different than the number of trail users. This can be attributed to several factors, such as the same trail user crossing the infrared counter twice (making a round trip on the trail segment), individuals walking side by side at a count location, or from another warm-blooded creature (animal) that passes the infrared counter.

Per the Connecticut Trail Census, trails with primarily out and back traffic can be estimated by adjusting the number of uses by a factor of 0.5 to obtain the amount of trail visitors. Considering that some of the usage along the NRV East Loop segment represents round trips (out and back traffic), trail usages summarized below will be adjusted by a factor of 0.8 to estimate total trail visitors. This adjustment factor reflects a mix of trail users traveling one direction through the trail segment (passing through the infrared counter once per trip) and trail users entering and exiting the trail at the same trailhead, which is reflective of out and back traffic (passing through the infrared counter twice per trip). This is reasonable given the mix of trail users along the NRV.

Figure 1 on the following page provides a summary of unadjusted average trail usage by day of week for the NRV East Loop segment during the year 2019. Trail usage is higher during the weekend days with approximately 200 average uses, with Saturday having the highest usage (202 uses). On average, the trail has an average of 146 uses. Applying the 0.8 adjustment factor to average Saturday trail uses, approximately 162 visitors use the NRV East Loop segment on a Saturday.

¹ <https://ctrailcensus.uconn.edu/wp-content/uploads/sites/2046/2020/03/2019-Trail-Use-Count-Data-Report.pdf>

² https://ctrailcensus.uconn.edu/wp-content/uploads/sites/2046/2020/07/June-2020_COVID-19-Trail-Impact-Report.pdf

³ <https://portal.ct.gov/-/media/DOT/documents/dstc/COVID-19-Traffic-Volume-Information.pdf>

Reference: Norwalk River Valley Trail 'Wil-Walk' Segment – Chipmunk Lane Parking Demand Study

Stantec also reviewed hour of day summary data to understand peak hour trail use. Hourly percent of trail use is illustrated in Figure 2 below and reflects seasonal changes in trail usage throughout the year. Average hourly trail usage is greatest during the middle of the day, with nearly 50 percent of daily trail usage occurring between 10AM and 3PM. Based on the hourly distribution of uses, peak hour trail use (10AM hour) represents 11 percent of average daily trail use.

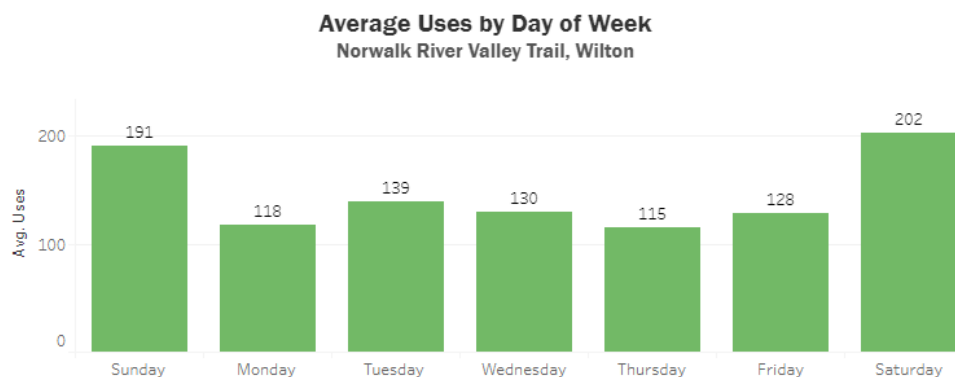


Figure 1 – Average Uses by Day of Week for NRVW Wilton East Loop Segment, 2019

Trail	Hour																							
	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM
Air Line Trail East Hampton	0%	0%	0%	0%	0%	0%	1%	2%	4%	7%	9%	10%	9%	9%	10%	10%	10%	9%	6%	3%	1%	0%	0%	0%
Air Line Trail Portland	0%	0%	0%	0%	0%	0%	1%	3%	6%	9%	12%	11%	8%	8%	8%	8%	8%	8%	7%	3%	1%	0%	0%	0%
Air Line Trail Thompson	0%	0%	0%	0%	0%	2%	2%	2%	4%	7%	10%	10%	10%	10%	12%	10%	8%	6%	4%	2%	1%	1%	0%	1%
Charter Oak Greenway Manchester	0%	0%	0%	0%	0%	0%	1%	3%	6%	7%	8%	8%	8%	7%	7%	8%	7%	9%	9%	7%	3%	1%	0%	0%
CTFastrak Trail New Britain	1%	1%	0%	0%	0%	3%	5%	6%	4%	4%	5%	6%	5%	6%	7%	7%	8%	9%	8%	6%	4%	2%	2%	2%
Farmington Canal Heritage Trail Cheshire	0%	0%	0%	0%	0%	0%	1%	3%	6%	8%	10%	11%	10%	10%	8%	8%	8%	7%	6%	3%	1%	0%	0%	0%
Farmington Canal Heritage Trail Hamden	0%	0%	0%	0%	0%	0%	1%	2%	4%	6%	8%	13%	10%	9%	10%	9%	9%	8%	6%	3%	1%	0%	0%	0%
Farmington Canal Heritage Trail New Haven	0%	0%	0%	0%	0%	0%	2%	5%	7%	7%	7%	7%	7%	6%	7%	8%	9%	10%	7%	5%	3%	2%	1%	1%
G&S Trolley Trail Groton	0%	0%	0%	0%	0%	0%	1%	3%	5%	8%	11%	12%	10%	8%	8%	9%	9%	9%	6%	3%	1%	0%	0%	0%
Hop River Trail Bolton	1%	0%	0%	0%	0%	1%	1%	3%	6%	8%	9%	10%	9%	10%	9%	8%	8%	8%	7%	3%	1%	0%	0%	0%
Hop River Trail Vernon	0%	0%	0%	0%	0%	0%	2%	4%	6%	10%	10%	9%	8%	8%	7%	8%	8%	8%	7%	4%	1%	0%	0%	0%
Larkin State Bridle Trail Oxford	0%	0%	0%	0%	0%	0%	1%	5%	7%	9%	11%	10%	9%	7%	8%	7%	8%	5%	3%	1%	0%	0%	0%	0%
Middlebury Greenway	0%	0%	0%	0%	0%	0%	4%	6%	8%	10%	10%	9%	8%	7%	6%	7%	7%	7%	6%	4%	2%	0%	0%	0%
Naugatuck River Greenway Trail Derby	0%	0%	0%	0%	0%	1%	2%	3%	6%	8%	9%	9%	9%	9%	9%	8%	8%	7%	6%	4%	1%	0%	0%	0%
Norwalk River Valley Trail Wilton	0%	0%	0%	0%	0%	0%	1%	2%	6%	10%	11%	10%	10%	9%	9%	9%	9%	8%	4%	2%	0%	0%	0%	0%
Riverfront Recapture Trail East Hartford	0%	0%	0%	0%	0%	0%	2%	2%	4%	5%	5%	8%	16%	12%	7%	6%	6%	7%	7%	6%	3%	2%	1%	0%
Riverfront Recapture Trail Hartford	0%	0%	0%	0%	0%	0%	1%	3%	5%	6%	6%	8%	16%	13%	9%	7%	6%	5%	5%	4%	2%	1%	1%	1%
Shoreline Greenway Trail Madison	0%	0%	0%	0%	0%	0%	1%	3%	5%	8%	10%	12%	10%	10%	10%	8%	9%	7%	4%	2%	1%	0%	0%	0%
Still River Greenway Brookfield	0%	0%	0%	0%	0%	0%	1%	3%	6%	8%	9%	8%	8%	7%	8%	9%	9%	9%	8%	5%	1%	0%	0%	0%
Sue Grossman Trail Torrington	0%	0%	0%	0%	0%	1%	2%	4%	7%	10%	9%	9%	9%	8%	7%	7%	8%	8%	6%	3%	1%	0%	0%	0%

Figure 2 – Average Hourly Percent of Total Daily Use for NRVW Wilton East Loop Segment, 2019

Reference: Norwalk River Valley Trail 'Wil-Walk' Segment – Chipmunk Lane Parking Demand Study

Trip Generation – NRVT Wilton East Loop Segment

Understanding the number of trips currently generated by the existing East Loop segment will provide a localized trip generation rate that can be applied to estimate the number of trips for the proposed 'Wil-Walk' segment. Using the average number of visitors per day on the East Loop segment and the population living in proximity to the East Loop segment (the catchment area⁴), a trip generation rate can be calculated.

The calculation of an average trip generation rate for the NRVT East Loop segment and underlying assumptions are presented in Table 1 below. Based on a discussion with NRVT, the catchment area for the East Loop segment was determined to be approximately 9 square miles; this reflects the length of the existing trail (2.25 miles) and an assumed 4-mile area⁵ surrounding the trail. Since the catchment area crosses into Weston, the calculated catchment area is distributed based on the proportion of land within the towns of Wilton and Weston. The NRVT East Loop generates one daily trip for every 36 people in the catchment area. It is important to note that these daily trips represent all modes of travel within the catchment area.

Table 1 – Average Trip Generation Rate: NRVT East Loop Segment

Wilton		Weston	
Wilton Population (Estimated) ¹	18,343	Weston Population (Estimated) ¹	10,252
Wilton Land Area (Square Miles) ¹	26.81	Weston Land Area (Square Miles) ¹	19.8
Wilton Population Density ²	684	Weston Population Density ²	518
Wilton Catchment Area ³ (Square Miles)	7.32	Weston Catchment Area ³ (Square Miles)	1.68
Wilton Population in Catchment Area ⁴	5,008	Weston Population in Catchment Area ⁴	870
Total Population in Catchment Area (Wilton and Weston)			5,878
Average 2019 Daily NRVT East Loop Segment Trail Visitors ⁵			162
Average Trip Generation Rate ⁶		1 trip per every 36 people	
Notes:			
¹ Data from US Census for the Towns of Wilton and Weston for the year 2019.			
² The quotient of the population and the land area (people per square mile).			
³ The catchment area is the product of the 2.25-mile long trail and an assumed 4-mile buffer area (2 miles to the west and east of the trail).			
⁴ The product of the population density and the catchment area.			
⁵ Based on 2019 NRVT East Loop Segment Average Day of Week Usage data for Saturday (highest day of the week; 202 uses) and an adjustment factor of 0.8 to estimate average daily trail visitors.			
⁶ This is derived by dividing the total population in the catchment area by the average 2019 daily trail users.			

⁴ This represents the area which would be attracted to use the segment of a trail.

⁵ This represents two (2) miles to the west and east of the trail. It is anticipated that populations north and south of the trail segment would use the nearest facilities available in those areas.

Reference: Norwalk River Valley Trail 'Wil-Walk' Segment – Chipmunk Lane Parking Demand Study

ESTIMATE OF AVERAGE DAILY TRAIL VISITORS – NRV T 'WIL-WALK' SEGMENT

This section of the memo describes Stantec's development of average daily trail visitors for the proposed NRV T 'Wil-Walk' segment. The calculation of estimated daily trail usage for the NRV T 'Wil-Walk' segment and underlying assumptions are presented in Table 2 below. Based on a discussion with NRV T, the catchment area for the East Loop segment was determined to be approximately 2.8 square miles; this reflects the length of the proposed trail (0.71 miles) and an assumed 4-mile area⁶ surrounding the trail. Since this catchment area is comprised of both Norwalk and Wilton, the calculated catchment area is distributed based on the proportion of land within the Town of Wilton and City of Norwalk.

It should be noted that the Norwalk population shown below only includes data for three US Census tracts along the northern perimeter of the City, near the Grist Mill Road and Main Avenue corridors. This approach was taken given the significant difference in population density for this area of Norwalk (1,911 people per square mile) when compared to the City as a whole (3,885 people per square mile). As shown below, a total of 100 daily visitors are estimated for the proposed NRV T 'Wil-Walk' segment, which is comparable to existing trail.

Table 2 – Average Daily Trip Generation: NRV T 'Wil-Walk' Segment

Norwalk		Wilton	
2019 Norwalk Population (Estimated) ¹ [Census Tracts 425,427,429 only]	10,511	2019 Wilton Population (Estimated) ¹	18,343
Norwalk Land Area (Square Miles) ¹ [Census Tracts 425,427,429 only]	5.5	Wilton Land Area (Square Miles) ¹	26.81
Norwalk Population Density ² [Census Tracts 425,427,429 only]	1,911	Wilton Population Density ²	684
Norwalk Catchment Area ³ (Square Miles)	1.35	Wilton Catchment Area ³ (Square Miles)	1.49
Norwalk Population in Catchment Area ⁴	2,574	Wilton Population in Catchment Area ⁴	1,021
Total Population in Catchment Area (Norwalk and Wilton)			3,596
Estimated Average Daily Trail Visitors ⁵			100
Notes: ¹ Data from US Census for the Town of Wilton (2019) and City of Norwalk (2018). For the City of Norwalk, only data from Census Tracts 425, 427, and 429 were used given the significant difference in population density for this area of Norwalk when compared to the City as a whole. ² The quotient of the population and the land area (people per square mile). ³ The catchment area is the product of the 0.71-mile long trail and an assumed 4-mile buffer area (2 miles to the west and east of the trail). ⁴ The product of the population density and the catchment area. ⁵ The product of the population in catchment area and an average trip generation rate of 1 trip per 36 people as calculated for the existing NRV T Wilton East Loop segment.			

⁶ This represents two (2) miles to the west and east of the trail. It is anticipated that populations north and south of the trail segment would use the nearest facilities available in those areas.

Reference: Norwalk River Valley Trail 'Wil-Walk' Segment – Chipmunk Lane Parking Demand Study

ESTIMATE OF PEAK HOUR TRAIL VISITORS AND PARKING DEMAND FOR THE NRV 'WIL-WALK' SEGMENT

Table 3 summarizes Stantec's estimates and underlying assumptions for peak hour trail visitors and peak hour parking demand for the 'Wil-Walk' segment. A total of 11 visitors are estimated to use the 'Wil-Walk' segment during the peak hour of a typical day. It is estimated that a total of 8 parking spaces would be needed to accommodate peak hour NRV visitors at Chipmunk Lane.

Table 3 – Average Daily Trip Generation: NRV 'Wil-Walk' Segment

Estimated Average Daily Trail Visitors ¹	100
Estimated Peak Hour Trail Visitors ²	11
Automobile Modal Split ³	78%
Vehicle Occupancy Factor ⁴	1.2
Hourly Parking Demand (Vehicles) ⁵	8
Notes: ¹ From Table 2 of this memo. ² The product of estimated average daily trail visitors and 11 percent (Based on the hourly distribution of uses, peak hour trail use (10AM hour) represents 11 percent of average daily trail use at the NRV East Loop segment). ³ This is the percentage of travel to/from NRV 'Wil-Walk' that is anticipated to be made via automobile. Data obtained from US Census for the Town of Wilton. This percentage (78%) is more conservative than the 71% automobile modal split shown within the NNYB Shared Use Path Visitor Parking Demand Study. It is anticipated that the remaining percentage of visitors will use other modes of transportation to access NRV. ⁴ This factor accounts for the fact that some visitors may travel together in one vehicle to/from the NRV 'Wil-Walk' segment. This is based on a review of the NNYB Shared Use Path Visitor Parking Demand Study. The factor of 1.2 is lower than the average factor of 1.85 determined from eight recreational areas in the Hudson Region of New York and reflects a higher share of individuals traveling alone by car to NRV. ⁵ This is determined by multiplying estimated peak hour trail visitors and the automobile modal split, and then dividing that value by the vehicle occupancy factor. The calculated value is rounded up to the nearest vehicle.	

If you have any questions regarding this parking demand study, please do not hesitate to contact me.

Sincerely,



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c. Phil Katz (Stantec), Mary Pate (Stantec)