

TECHNICAL MEMORANDUM

Project: White Center Community HUB Mixed-Use Project 10821-8th Avenue SW, Seattle, WA

Subject: Trip Generation and Distribution Assessment

Date: February 25, 2021

Author: Marni C. Heffron, P.E., P.T.O.E.

This memorandum summarizes the trip generation assessment completed for the White Center Community Hub project at 10821-8th Avenue SW in unincorporated King County. The assessment includes estimates of daily and peak hour trip, as well as how those trips would distribute to the vicinity roadway system. This assessment is intended to assist King County's transportation review, and help determine the scope of the transportation impact analysis required to support project permitting.

1. **Project Identification Information**

Project Sponsors	White Center CDA
Primary Sponsor Contact	Aaron Garcia (206) 694-1082; aaron@wwccda.org
King County DDES Permit File Number	#PREA20-0142
Site Address	10821-8 th Avenue SW, Seattle, Washington, 98146
Study prepared by	Marni C. Heffron, PE, PTOE, Heffron Transportation, Inc. 206-523-3939; marni@hefftrans.com

2. Project Description

The White Center Community Hub project would be developed and operated through a partnership between the White Center Community Development Association (WCCDA), Southwest Youth and Family Services (SWYFS), Food Empowerment Education Sustainability Team (FEEST), YES! Foundation, and HealthPoint. The project is additionally supported through Community Roots Housing, King County Department of Community and Human Services, and Communities of Opportunity. The project would include a mix of residential, clinic, educational, office, and community space as summarized in Table 1.

Land Use	Size
Multifamily Residential	76 affordable units
Clinic	2,500 square feet (sf), 6 exam rooms, 10 HealthPoint staff members
Social Service Center (SWYFS)	4,700 sf, including a small 500 sf short-term day care room. Up to 19 SWYFS staff members.
Education Facility (SWYFS, Yes)	4,500 sf, 3 classrooms (17 students each) 3 SWYFS teachers during daytime, 4 YES! staff members after school
Community Room	2,400 sf,
Community Service Building (office space)	5,300 sf for community service organizations including WCCDA, FEEST, Yes. Up to 29 staff members in addition to those listed for above uses
Parking	87 spaces

Source: Sundberg, Kennedy, Ly-Au Young Architects, June 9, 2020

SWYFS = Southwest Youth and Family Services; Yes = Yes! Foundation; WCCDA = White Center Community Development Association; and FEEST = Food Empowerment Education Sustainability Team

The project would remove existing uses at the site. These include a 13,660-sf building that is currently in use by Mary's Place, a family shelter that can accommodate up to 60 people, and a 3,801-sf building that houses the White Center Food Bank. The project would also remove surface parking lots with a total of about 87 parking spaces.





White Center Community HUB Mixed-Use Project Trip Generation and Distribution Assessment

T EXISTING TRAFFIC ROUND SW 108TH STREET ABOUT EXISTING ╶┨╾┽╶┽╴┟╌┨╼┽╶╇ ONE WAY 122'-4 229/256' NORTH PARKING LOT TOTAL = 49 ()0 ABANDON ` LOT LINE EXISTING "IN" E ONLY ACCESS DRIVEWA NO INI 4 **REPAIR AND** 20'-0" 6 2 EXTEND SIDEWALK (N) CURB CUT 111 8TH AVE NEW 4 STORY MULTI FAMILY PER CIVIL **RESIDENTIAL BUILDING** 1 **76 RESIDENTIAL UNITS** SI COMMUNITY IN OUT PLAZA 20'-0" **EXISTING CURB** CUT AND DRIVE TO REMAIN ONE WAY DRIVE **BIKE STORAGE** ΗH 1 BELOW 4 SOUTH PARKING \square LOT TOTAL = 38 COMMUNITY BUILDING 24,960 SF DICK THURNAU MEMORIAL PARK 0 10' 20' 40' 60' 10821 8TH AVE SW PARCEL: 0623049405 LOT SIZE: 122317 SF 2.8 ACRES





3. Trip Generation

Trip estimates for the project were determined using procedures set forth in the *Trip Generation Handbook*.¹ The Institute of Transportation Engineers (ITE) recognizes that development projects located in urban environments generate fewer trips than those in suburban settings, and recommends processes to account for non-vehicle trips being made to, from and within a site because it is:

- Surrounded by compact urban development with nearby complementary land uses (infill site);
- Consists of a mix of complementary land uses in any part of an urban region (mixed-use development);
- Is served by public transit, in particular if designed specifically to capitalize on transit access to the site (transit-friendly development); or
- Is in an area that has a noticeable amount of walking and bicycling activity or an area planned for promotion of non-motorized travel (as examples, sites in urban core areas or sites near schools and senior centers).

The proposed project is considered a "mixed-use" and "multimodal" site based on these attributes; therefore, the following approach recommended in the *Trip Generation Handbook* was used to estimate trips for each mode of travel. This generalized process combines methods applied to mixed-use, urban infill, and transit-friendly developments.

- Estimate the number of person trips for each land use;
- Estimate internal person trips based on capture rates for land use pairs and proximity (*note, no internal trips were assumed in this analysis because they were included in the non-motorized mode share assumption*);
- Estimate the external person trips by mode of travel using the local mode of travel factors for the site; and
- Convert the person trips by vehicle into adjusted vehicle trips using the local vehicle occupancy rates for the site.

Each of these steps is described in the following sections.

3.1. Baseline Trip Generation Factors

Table 2 summarizes the baseline trip generation rates and average vehicle occupancy (AVO) factors used to estimate person trips for the proposed project. Through review of the various ITE land use category descriptions, it was determined that the "Recreational Community Center," which includes provision of classes and clubs, most closely represents the combined functions of the planned social service center, community room, and education facility.

¹ Institute of Transportation Engineers, *Trip Generation Handbook*, 3rd Edition, September 2017.



Land Lise	ITE Baseline Trin Generation	Baseline Ave Occupancy (erage Vehicle (AVO) Rates ^b	Baseline Vel	nicle Trip % ^b						
(ITE Land Use Code)	Rates & Equations ^a	Inbound	Inbound Outbound		Outbound						
Multifamily Housing (Midrise, General Urban/Suburban) (221) - Rental dwelling units located within the same building with											
at least three other dwelling	units and that have between three and	d 10 floors.									
Daily	T = 5.45(X) - 1.75	1.14 °	1.15°	98% ^c	98% ^c						
AM Peak Hour	Ln(T) = 0.98 Ln(X) - 0.98	1.13	1.09	89%	97%						
PM Peak Hour	Ln(T) = 0.96 Ln(X) - 0.63	1.15	1.21	96%	95%						
Recreational Community C include classes and clubs fo typically allowed but a fee m	Recreational Community Center (495) – A stand-alone public facility similar to and including YMCAs. These facilities often include classes and clubs for adults and children; meeting rooms; fitness and/or other recreational facilities. Public access is typically allowed but a fee may be charged.										
Daily	28.82 trips/1,000 sfgfa	1.50 d	1.50 d	100% d	100% ^d						
AM Peak Hour	1.76 trips/1,000 sfgfa	1.50 d	1.50 d	100% ^d	100% ^d						
PM Peak Hour	2.31 trips/1,000 sfgfa	1.50 ^d	1.50 ^d	100% ^d	100% d						
Clinic (630) – Facility that pr and surgical care. Clinic corr	rovides limited diagnostic and outpatie monly have lab facilities, supporting p	ent care but is un pharmacies, and	nable to provide I a wide range c	prolonged in-h f services.	ouse medical						
Daily	38.16 trips/1,000 sfgfa	1.55 ^e	1.55 ^e	100% ^f	100% ^f						
AM Peak Hour	3.69 trips/1,000 sfgfa	1.40 e	1.40 e	100% ^f	100% ^f						
PM Peak Hour	3.28 trips/1,000 sfgfa	1.69 ^e	1.69 e	100% ^f	100% ^f						
General Office (710) – An office building that may houses a mixture of tenants including professional services, insurance companies, investment brokers and/or tenant services. Because the average office space per employee would be lower than that inherent in the ITE rates per square feet, rates per office employee were used.											
Daily	9.74 trips/1,000 sfgfa	1.09°	1.07 °	99% °	99% °						
AM Peak Hour	1.16 trips/1,000 sfgfa	1.06	1.06	99%	100%						
PM Peak Hour	1.15 trips/1,000 sfgfa	1.11	1.07	100%	99%						

Table 2. Baseline Trip Generation Rates, Equations and AVO Assumptions

a. Source: Institute of Transportation Engineers (ITE) Trip Generation, 10th Edition, 2017, unless otherwise noted. For residential equations, T = number of trips, X = number of dwelling units; for commercial rates, "sfgfa" = square feet of gross floor area.

b. Percentage of vehicle trips inherent in the ITE trip rates. Values less than 100% reflect trips made by walk and transit modes.

c. Daily AVO rate and/or vehicle trip % not provided by ITE. Estimated by Heffron Transportation, Inc. – reflects average of AM and PM peak hour values.

d. AVO rate and/or vehicle trip % not provided by ITE for community centers. Estimated by Heffron Transportation, Inc.

e. Clinic AVO rate for AM and PM peak hours based on information provided in the Trip Generation Manual, 10th Edition, for the Clinic Land Use.

f. Clinic vehicle trip % not provided by ITE; estimated by Heffron Transportation.



3.2. Person Trips Generated by Proposed Project

Table 3 summarizes the expected person trip generation for the proposed project. The total number of person trips is estimated at 1,190 per day, with 80 during the AM peak hour and 104 during the PM peak hour.

		Daily	AM Peak Hour			PM Peak Hour		
Land Use	Size	Trips	In	Out	Total	In	Out	Total
Multifamily Housing-Midrise (LU 221)	76 units	480	9	21	30	25	17	42
General Office (LU 710)	5,300 sf	60	6	1	7	1	6	7
Clinic (630)	2,500 sf	150	10	3	13	4	10	14
Community Center (LU 495)	11,600 sf	500	20	10	30	19	22	41
Total Person Trips		1,190	45	35	80	49	55	104

Table 3. Total Person Trips Generated – Proposed Project

Source: Heffron Transportation, Inc. December 2020. Trips estimated using procedures in the ITE Trip Generation Handbook, 2017. LU = Land Use Code from the ITE Trip Generation Manual.

Mode of Travel and Local Vehicle Occupancy

After the number of person trips was estimated, the person trips were separated by mode of travel based on the mode-split percentages appropriate for each type of use in the area. The resulting person trips made by vehicle were converted to vehicle trips using the locally-derived vehicle occupancy rate.

Mode-of-travel data for the proposed residences and the general office component was derived from 'Journey-to-Work' survey results compiled by the Puget Sound Regional Council (PSRC).² Results were compiled for Transportation Analysis Zone (TAZ) 351, where the project site is located. The data showed that for residential trips in the area, about 6% are walk/bike/other trips, 14% are transit trips, and 80% are vehicle trips, with a local AVO of 1.11 persons per vehicle. In addition to the residential use, since the community center and clinic are primarily intended to serve residents in the area, the residential travel mode shares were also applied to these uses. The AVO for the community center and clinic were assumed to be the same as baseline.

The Journey-to-Work data indicate that for employee trips in the area, about 5% are walk/bike/other trips, 1% are transit trips, and 94% are vehicle trips, with a local AVO of 1.08 persons per vehicle. These mode shares and AVO were applied to the office trips.

Table 4 summarizes the expected person trips for the proposed project by mode of travel.

² PSRC, Journey-to-Work data compiled from the US Census Bureau, 2006-2010 American Community Survey Estimates, January 31, 2014.



White Center Community HUB Mixed-Use Project Trip Generation and Distribution Assessment

			AM Peak Hour Trips			PM Peak Hour Trips		
Type of Trip by Mode	% of Trips	Daily Trips	In	Out	Total	In	Out	Total
PERSON TRIPS								
Residential								
Walk, Bike, & Other Trips	6%	30	1	1	2	2	1	3
Transit Trips	14%	70	1	3	4	4	2	6
Person Trips by Vehicle	80%	380	7	17	24	19	14	33
Total Person Trips	100%	480	9	21	30	25	17	42
Office								
Walk, Bike, & Other Trips	5%	0	0	0	0	0	0	0
Transit Trips	1%	0	0	0	0	0	0	0
Person Trips by Vehicle	94%	60	6	1	7	1	6	7
Total Person Trips	100%	60	6	1	7	1	6	7
Clinic								
Walk, Bike, & Other Trips	6%	10	1	0	1	0	1	1
Transit Trips	14%	20	1	1	2	1	1	2
Person Trips by Vehicle	80%	120	8	2	10	3	8	11
Total Person Trips	100%	150	10	3	13	4	10	14
Community Center								
Walk, Bike, & Other Trips	6%	30	1	1	2	1	1	2
Transit Trips	14%	70	3	1	4	3	3	6
Person Trips by Vehicle	80%	400	16	8	24	15	18	33
Total Person Trips	100%	500	20	10	30	19	22	41
Total Person Trips								
Walk, Bike, & Other Trips		70	3	2	5	3	3	6
Transit Trips		160	5	5	10	8	6	14
Vehicle Trips		960	37	28	65	38	46	84
Total Person Trips		1,190	45	35	80	49	55	104

Table 4. Person Trips by Mode of Travel – Proposed Project

Source: Heffron Transportation, Inc., December 2020.



Vehicle Trips – Proposed Project

Vehicle trips were determined by applying the local AVO rates to the person trips generated by each land use. The total vehicle trips for the proposed project are summarized in Table 5. The total trips generated by the proposed project are estimated at about 750 vehicle trips per day, with 51 vehicle trips during the AM peak hour and 66 during the PM peak hour.

		Dailv	AM Peak Hour			P	M Peak Hou	ur
Land Use	Size	Trips	In	Out	Total	In	Out	Total
Residential	76 units	340	6	15	21	17	13	30
Office	5,300 sf	60	6	1	7	1	6	7
Clinic	2,500 sf	80	6	1	7	2	5	7
Community Center	11,600 sf	270	11	5	16	10	12	22
Total Vehicle Trips		750	29	22	51	30	36	66

Source: Heffron Transportation, Inc. August 2020. Estimated using procedures in the ITE Trip Generation Handbook, 2017.

3.3. Vehicle Trips – Existing Use

The trips generated by the existing family shelter and food bank would be eliminated with the project. For the family shelter, the trip estimates assumed that the 60-person capacity would be equivalent to 20 multifamily units, and applied the same residential assumptions described for the proposed residential units. For the food bank, trips estimates were derived based upon the operational characteristics of the facility.³ Most of the trips generated by the food bank are related to food distribution, which occurs during off-peak periods of the day (10:45 A.M. to 1:45 P.M., or 12:00 P.M. to 3:45 P.M., depending on the day). Trips were based upon typical operation during pre-COVID conditions (during the pandemic the food bank has experienced much higher demand than was previously typical). For the 3.75-hour food distribution period, the daily trip estimates reflect an average of 32 customers per hour who come to the site for pick-up (32 trips in, 32 trips out), and 4 deliveries per hour (4 trips in, 4 trips out) by which food packages are delivered to off-site locations (generally about 10 to 15 boxes per driver). The food bank estimates that 8 to 15 volunteers come to the site each day; these trips were also assumed to occur at off-peak times of day. The only peak hour trips generated by the food bank were assumed to be generated by the 11 staff members; ITE's rates per employee for Office (Land Use Code 710) were applied to estimate these trips.

The total estimated person and vehicle trips for the existing uses at the site are summarized in Table 6. The total trips generated by the existing site are estimated at about 380 vehicle trips per day, with 10 vehicle trips during the AM peak hour and 10 vehicle trips during the PM peak hour.

³ Food bank operational information was provided by Marèlle Habennicht, Executive Director of the White Center Food Bank, and supplemented with information at <u>www.whitecenterfoodbank.org</u>, July 2020.



			AM Peak Hour Trips			PM Peak Hour Trips		
Type of Trip by Mode	% of Trips	Daily Trips	In	Out	Total	In	Out	Total
PERSON TRIPS								
Food Bank								
Walk & Bike Trips	5%	10	0	0	0	0	0	0
Transit Trips	10%	40	1	0	1	0	1	1
Vehicle & Other Trips	85%	280	2	1	3	1	2	3
Total Person Trips	100%	330	3	1	4	1	3	4
Family Shelter								
Walk & Bike Trips	6%	10	0	0	0	0	1	1
Transit Trips	14%	20	0	1	1	1	1	2
Vehicle & Other Trips	80%	100	2	5	7	6	2	8
Total Person Trips	100%	130	2	6	8	7	4	11
Total Person Trips								
Walk & Bike Trips		20	4	2	6	4	4	8
Transit Trips		60	5	2	7	4	5	9
Vehicle & Other Trips		380	8	5	13	8	8	16
Total Person Trips		460	17	9	26	16	17	33
VEHICLE TRIPS								
Food Bank		280	2	1	3	1	2	3
Family Shelter		100	2	5	7	5	2	7
Total Vehicle trips		380	4	6	10	6	4	10

Table 6.	Trips	Generated	by Existing	g Site Uses –	To Be Removed
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Source: Heffron Transportation, Inc., August 2020.

3.4. Net New Vehicle Trips

The net new trips expected to be generated by the project consist of the total project-generated trips minus the trips generated by the existing uses. The net change in vehicle trips is summarized in Table 7. As shown, the project is expected to generate 370 net new vehicle trips per day, with 41 during the AM peak hour and 56 during the PM peak hour.

Table 7. Net New Vehicle Trips Generated by the Proposed Project

		AM Peak Hour			AM Peak Hour PM Pea				M Peak Ho	ır
	Daily Trips	In	Out	Total	In	Out	Total			
Proposed Project	750	29	22	51	30	36	66			
Existing Uses (removed)	- 380	- 4	- 6	- 10	- 6	- 4	- 10			
Total Net Change	370	25	16	41	24	32	56			

Source: Heffron Transportation, Inc., August 2020.



4. Trip Distribution and Assignment

The project would generate a combination of resident and local service trips. During the peak hours, residents would travel to and from regional employment centers such as downtown Seattle or Duwamish and Green River industrial area, as well as local attractions such as schools and retail centers. The office, clinic and community center would attract trips from the local neighborhoods. The trip distribution pattern developed for the nearby Technology Access Foundations' Bethaday Community Learning Center⁴ reflects that combination of local and regional travel, and was applied for this project. The trip distribution pattern is shown on Figure 3.

The net change in trips were assigned to the roadway network according to that pattern. The AM and PM peak hour trip assignments are also shown on Figure 3. As shown, the project would add the most trips to the roundabout intersection located at SW 108th Street/8th Avenue SW adjacent to the street. The arterial intersections east and west of the site would experience trip increases of less than 25 trips during the peak hours.

⁴ Heffron Transportation, Inc., *Transportation Impact Analysis for Lakewood Park Community Learning Center (DDES* #A06PM265), July 12, 2007.





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5. Transit Facilities

The site vicinity is served by two bus routes provided by King County Metro (Metro). The nearest bus stops are located on SW 108th Street at 8th Avenue SW, adjacent to the site, and on 4th Avenue SW at SW 108th Street, about 1,500 feet east of the site. Table 8 describes the bus routes that serve these stops. The service reflects published schedule information effective September 19, 2020; some routes may currently be operating with some reduced service due to demand reductions resulting from COVID-19.

Table 8.	Existina	Transit	Service	within	One-	Quarter	Mile	of the	Proie	ct Site
10010 01	E/dealing	11011010	0011100		0.10	addition		01 110		0. 01.0

Metro Route	Closest Stop	Areas Served	Typical Headway a (minutes)
128	SW 108 th Street at 8 th Avenue SW	West Seattle, White Center, Tukwila, South Center	30
131	4 th Avenue SW at SW 108 th Street	Downtown Seattle, West Seattle, White Center, Burien	15 – 30

Sources: King County Metro Transit, October 2020.

a. Typical weekday frequency between buses (headways) in minutes, per direction.

6. Site Access

The project plans to have two site access driveways, each of which would connect to a surface parking lot. The northern driveway would be moved south from where the site's existing driveway is located, nearly doubling the distance between the driveway and SW 108th Street (135 feet compared to the current 66 feet). The southern driveway would be located where the existing site driveway is located. It is noted, that the southern driveway cannot be moved further south since there is an intervening property between the subject site and 8th Avenue SW.

Both driveways are expected to operate at good levels of service since 8th Avenue SW is a dead-end street with very little traffic. The plan to move the northern driveway further from the intersection should improve operations and safety approaching the nearby roundabout to increasing sight lines and decision time.

7. Summary

The project is expected to generate about 370 net new trips per day, with 41 trips during the AM peak hour and 56 trips during the PM peak hour. Only one intersection—SW 108th Street/8th Avenue SW— would experience an increase in traffic of more than 25 trips during the peak hours. This intersection was recently upgraded with a roundabout. The small number of net new trips generated by the project are not expected to adversely affect operations of this intersection. Both site driveways are expected to operate at good levels of service, and the site would move the northern site driveway further from 108th Street SW, which would improve sight lines and decision time for that site driveway. No mitigation should be needed to accommodate the proposed project.

MCH/JAB

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