

10-0969-020A
September 14, 2023

Patrick van den Bogaard
Head of Corporate Real Estate Wilton, CT and US Field Offices
ASML
77 Danbury Road
Wilton, CT 06897

Re: **Traffic and Parking Statement**
Materials Intake and Contamination Control (MICC) Facility Project
77 Danbury Road (U.S. Route 7), Wilton, Connecticut

Dear Mr. van den Bogaard:

Tighe & Bond has prepared this traffic impact and parking statement to review the potential impact of the proposed ASML Materials Intake and Contamination Control (MICC) Facility Project at 77 Danbury Road (U.S. Route 7) in Wilton. This statement is provided in support of the Town of Wilton Planning & Zoning and Office of the State Traffic Administration (OSTA) approval processes for the proposed expansion. The analysis presented in the following statement shows that the proposed project is not expected to have a significant impact on traffic operations and the future operations of the site will be planned to manage parking demand and provide sufficient parking supply.

Existing Conditions

The 77 Danbury Road property houses ASML's main Wilton campus with approximately 388,642 square feet of manufacturing and supportive office and administrative space. The property is bordered by Danbury Road (U.S. Route 7) to the east, the Metro North Danbury Branch Line railroad to the west, the Norwalk River to the south, and residential properties to the north. The property is accessed via a driveway on Danbury Road located near the south end of the site opposite Grumman Hill Road. A Site Location Map depicting the property and the surrounding area is provided in Figure 1.

Parking for the site is accommodated via surface and structured parking. Per previous site approvals, the ASML site has approximately 1,127 parking spaces. Surface parking is provided to the west, east (under construction), and south (currently used for construction staging) of the building. Additional surface parking is provided south of the 71 Danbury Road building that is accessed via a separate driveway on Danbury Road approximately 300 feet south of the 77 Danbury Road driveway. A parking garage is provided to the north of the 77 Danbury Road building.

Internal site circulation is provided via a circulatory roadway. The roadway connects to the site driveway via a bridge over the Norwalk River. On the site side of the bridge, a three-leg, all-way stop intersection controls movements to and from the circulatory roadway north and south. To the north, the circulatory roadway provides access to surface parking and will be the main access for the parking garage once the northern driveway connection to the parking garage is completed (currently under construction with completion expected in Fall 2023). To the south, the circulatory roadway provides access to the building loading areas, the southern and western surface parking, and provides access to the lower level of the parking garage.

In addition to the campus at 77 Danbury Road, ASML operates at other facilities in Wilton. ASML leases building space and parking at 59 Danbury Road and 50 Danbury Road and has recently purchased 20 Westport Road (State Route 33) to further expand their available operating space and parking. A shuttle service is provided between the Wilton locations to facilitate the movement of employees between the sites.

Study Area Intersection & Roadways

The signalized intersection of Danbury Road (U.S. Route 7) at 77 Danbury Road and Grumman Hill Road comprises the study area. The Danbury Road northbound and southbound approaches each provide a shared through right, a through lane, and left turn lane. The 77 Danbury Road approach contains a shared-through left and right turn lane while the Grumman Hill Road approach has one lane for all movements. The signal has protected-permitted left turns for Danbury Road, a single phase for the 77 Danbury Road and Grumman Hill Road approaches, and an exclusive pedestrian phase allows for pedestrian movements across all legs of the intersection. Further details about Danbury Road and Grumman Hill Road are provided in the following paragraphs.

Danbury Road (U.S. Route 7) runs north-south and is classified as a Principal Arterial by the Connecticut Department of Transportation (CTDOT) and the Wilton Plan of Conservation and Development (POCD). Danbury Road serves as the main corridor within Wilton and connects Interstate 95 in Norwalk to the south with Interstate 84 in Danbury to the north, where it continues north beyond the Connecticut State Line. The roadway has a four-lane cross-section with additional left-turn lanes at the 77 Danbury Road Site Driveway and Grumman Hill Road intersection. In the vicinity of the site, lane widths range from 10 to 12 feet and shoulder widths range from 3 to 5 feet. Sidewalk is provided along both sides of the roadway south of the 77 Danbury Road Site Driveway and Grumman Hill Road intersection and on the east side to the north of the intersection. The posted speed limit on Danbury Road is 40 miles per hour within the study area.

Grumman Hill Road, located directly across from the site driveway, is a local road as classified by CTDOT and the Wilton POCD. It runs from the Danbury Road (U.S. Route 7) intersection with the site driveway to the east to Chestnut Hill Road (State Route 53) to the west, which connects to Westport Road (State Route 33) to the north. The roadway provides access to residential properties outside of the commercial properties immediately adjacent to Danbury Road. It has a two-lane cross section with 11 to 12-foot travel lanes and no shoulders. A speed limit of 25 miles per hour is set on Grumman Hill Road.

Collision History

Vehicle collision history was collected from the Connecticut Crash Data Repository at the study area intersection of Danbury Road with the Site Driveway and Grumman Hill Road between January 1, 2017 and June 2023. These five plus years of data were reviewed to assess pre-pandemic conditions through the most recent available data. Table 1 provides a summary of the collision types and severity.

As shown in Table 1, there were 57 motor vehicle collisions reported within the period analyzed. The most frequent type of collision was rear-end, which accounted for 26 crashes (45.6%). Angle was the second most common at 21 collisions (36.8%). The remaining ten crashes were same-direction sideswipes. Throughout the period analyzed, there were no fatalities or collisions reporting serious injuries. All collisions resulted in minor injuries or property damage only. There were no collisions reported with bicyclists or pedestrians.

A significant and/or abnormal pattern of collisions was not identified from the analysis. The proposed project and site-generated traffic are not anticipated to negatively impact existing collision patterns or roadway safety at the study intersection.

Traffic Volumes

The study analyses focus on the weekday morning (7:00 AM to 9:00 AM) and weekday afternoon peak periods when commuter and/or site-generated traffic volumes are typically at their highest levels. Existing traffic volumes were collected via a 24-hour manual intersection turning movement counts (TMCs) conducted at the study area intersection in late November 2022. The data showed that the weekday morning and afternoon peak hours occurred from 7:30am to 8:30am and 4:45pm to 5:45pm, respectively. In addition, there was an early afternoon peak from 2:15pm to 3:15pm that coincides with ASML's manufacturing shift change. The 2023 Existing Traffic Volumes for the weekday morning, weekday afternoon shift change, and weekday afternoon peaks are presented in Figures 2 through 4, respectively. Raw TMC data is included for reference.

Proposed Conditions

The application proposes to construct a multi-story, approximately 167,036 square foot expansion to the southwest corner of the existing 77 Danbury Road Building. The lower levels of the building will house the MICC of approximately 90,200 square feet, while the upper levels will house associated and supportive office and administrative space of approximately 76,836 square feet. Following the expansion, the site will include approximately 555,678 square feet of manufacturing and associated office and administration space. ASML envisions as phased construction of the expansion with the MICC (lower levels) constructed in the first phase and the upper levels in a second phase. For the purposes of this analysis, the expansion is expected to be completed by the end of 2025.

Access to the 77 Danbury Road Site will remain via the existing driveway on Danbury Road at the signalized intersection across from Grumman Hill Road. Within the site, the construction of the MICC will reconfigure the southern portion for expansion of the loading operations replacing the existing surface parking (currently being utilized for construction staging). The access roadway on the west side of the building will be maintained through the revised southern loading area providing access to the western surface parking and parking garage, though the main access for parking will be via the driveway on the east side of the building. The revised circulation of the site will allow for separated larger truck traffic to the south and the majority of employee/visitor traffic to the north. Following construction, site parking will be located in the surface lots to the east and west of the building and the garage to the north of the building with 901 parking spaces.

Site-Generated Traffic

The MICC expansion is not expected to result in a significant increase in site traffic. The MICC project aims to expand manufacturing operations within the expansion and the existing building that will require existing services to be reduced and/or relocated. In anticipation of these revisions, ASML has begun and will continue to transition existing employees from 77 Danbury Road to other facilities. By the end of 2023, up to 600 employees are expected to be relocated to other facilities with more expected as the MICC expansion progresses.

Despite the expected offset of site-generated traffic, analyses with increased traffic volumes were undertaken to understand the ability of the Danbury Road at ASML Driveway and Grumman Hill Road intersection to accommodate additional traffic. To account for general traffic growth in the area, the 2023 Existing Traffic Volumes were projected to the 2025 project completion year using a 0.75% annual growth rate. Utilizing these 2025 projected

volumes as a baseline, iterative analyses were then performed to determine the site traffic increase that the study area intersection could accommodate while maintaining acceptable operations of LOS D or better for all movements. Based on the analyses summarized in the following section, it was determined that the intersection can accommodate approximately 60 percent more ASML site traffic than 2023 Existing Conditions. The 60 percent increase equates to approximately 168 weekday morning, 221 weekday afternoon shift change, and 128 weekday afternoon additional peak hour trips. The 2025 Future Traffic Volumes, which include the existing volumes plus the annual traffic growth and 60 percent site traffic increase, are presented in Figures 5 through 7 for the weekday morning, afternoon shift change, and afternoon peaks, respectively.

For comparative purposes, site-generated traffic estimates for the MICC expansion were calculated based upon the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, 2021. Based on ITE data, the 167,036 square foot manufacturing space expansion is expected to generate approximately 111 weekday morning, 136 weekday afternoon shift change, and 124 weekday afternoon peak hour trips, all of which are lower than the estimated 60% increase. The site-generated traffic summary is outlined in tabular format in Table 2.

Traffic Analyses

Traffic capacity and queue analyses were performed at the study intersection for the 2023 Existing and 2025 Future conditions during the weekday morning, afternoon shift change and afternoon commuter peak hours using Trafficware Synchro Studio 11 – Traffic Analysis Software. The software conducts the analyses based on the methodology provided in the *Highway Capacity Manual, 6th Edition*. The analysis results are categorized in terms of Level of Service (LOS) and queue. LOS describes the qualitative intersection operational conditions based on the calculated average delay per vehicle. The queue analysis results are summarized based on the length of vehicle queues on an intersection approach. The queues are quantified for 50th (average) and 95th (design) percentile queues with 25 feet representing one car length. Attached is a detailed summary of the HCM capacity analysis methodology. Tables 3 and 4 summarize the capacity and queue analyses results, respectively. Capacity analyses worksheets with full inputs, settings, and results are also attached for reference.

As described in the previous section, an iterative analysis was performed to determine the increased traffic that the Danbury Road at ASML Driveway and Grumman Hill Road. As shown in Table 3, the intersection operates acceptably with overall LOS C or better and movements operating at LOS D or better during all three peak hours. Queues remain within available storage with increases largely less than two vehicles, except for the northbound left movement during the morning peak hour which extends past available storage due to the proximity of the opposing southbound left turn lane to Hollyhock Road. The adjacent northbound through lane has sufficient space to store the additional left turning vehicles.

Parking

As mentioned in the existing conditions section, the ASML site includes a mix of surface and garage parking surrounding 77 Danbury Road and south of the 71 Danbury Road building. The on-site parking is regularly at capacity on weekdays between the hours of 8:30 AM and 3:00 PM with the combination of manufacturing and office and administration staff accessing the site during that period. ASML is committed to providing sufficient parking for their employees and visitors and has purchased 20 Westport Road with shuttle service to satisfy the additional parking needs of the proposed expansion.

As detailed in the Site-Generated Traffic section, the proposed expansion and the expansion of manufacturing on the 77 Danbury Road site both within the expansion area and within the existing building will require that existing services be reduced or relocated. In anticipation of these revisions, ASML has begun and will continue to transition existing employees from 77 Danbury Road to other facilities. By year end, up to 600 employees are expected to be relocated to other facilities with more expected as the expansion progresses. The relocations will serve to maintain or improve existing parking operations by increasing the available parking spaces for existing and future employees of and visitors to the 77 Danbury Road site. In addition, the MICC will be focused on receiving and cleaning materials, a use with significantly less parking demand than the other manufacturing, office, and administrative space that will be relocated.

In addition to the relocation of employees, there are several travel and parking demand management strategies that ASML intends to deploy to reduce the traffic volume and parking demand at the facility including, but not limited to, the following:

- a) Local off-site parking with shuttle service between ASML campuses.
- b) Organization of a carpooling/vanpooling program for employees in similar geographies utilizing Connecticut parking and ride locations. ASML records indicate that there are at least 10 local communities with over 50 employees.
- c) Promotion of CT Rides Program that provides state-sponsored incentives to those that commute with greener transportation options.
- d) Emergency ride home program to allow employees who have carpooled or commuted without a vehicle to get a ride to their vehicle or other destination.
- e) Stated remote work policy for certain employees to reduce peak traffic and parking demand.
- f) Distribution of information to employees about alternative commuting options and incentives to promote use.
- g) On-demand parking management systems tracking the real-time availability of parking within facilities to allow for diversion of vehicles to areas with available spaces.

Through the combination of employee relocation, off-site parking at 20 Westport Road, and the implementation of the above strategies, ASML will work to address the parking needs of the facility into the future. ASML realizes that this proposed parking plan presents challenges under the current Zoning Regulations, with remote parking needed to accommodate the parking demand, and a revision to the existing Zoning Regulations has been proposed. The revised Zoning Regulations would allow off-site parking for certain entities subject to a Parking Management Plan (PMP), updated on a regular basis, that confirms sufficient parking and operations. A PMP for ASML under this proposed regulation is attached.

In addition, further master planning efforts are underway for ASML within Wilton and additional parking supply both on- and off-site will be considered to ensure that future parking needs are met. As part of the master planning efforts, the proposed expansion is expected to be staged into two phases, the initial phase being the MICC (lower levels) and the upper levels in a subsequent phase. The phased approach will allow for further planning of parking operations based on parking demand assessments with portions of the expansion being opened.

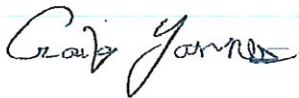
Conclusion

Based on the results of the analyses, it is the professional opinion of Tighe & Bond that the traffic generated by the proposed MICC will be offset by the relocation of employees off-campus and there will be no significant impact on traffic operations within the study area. The analyses show that the driveway intersection can accommodate an increase in traffic while still operating at an acceptable LOS and queues that fit within available storage.


The future operations of the site will be planned to manage parking demand with off-site parking, employees relocating off-site, and travel/parking demand management measures implemented. A Parking Management Plan has been provided under a proposed revised Zoning Regulation allowing the Wilton Planning and Zoning Department and Planning and Zoning Commission to regulate the proposed parking operations at the 77 Danbury Road campus.

Sincerely,

TIGHE & BOND, INC.



Craig D. Yannes, PE, PTOE, RSP1
Project Manager

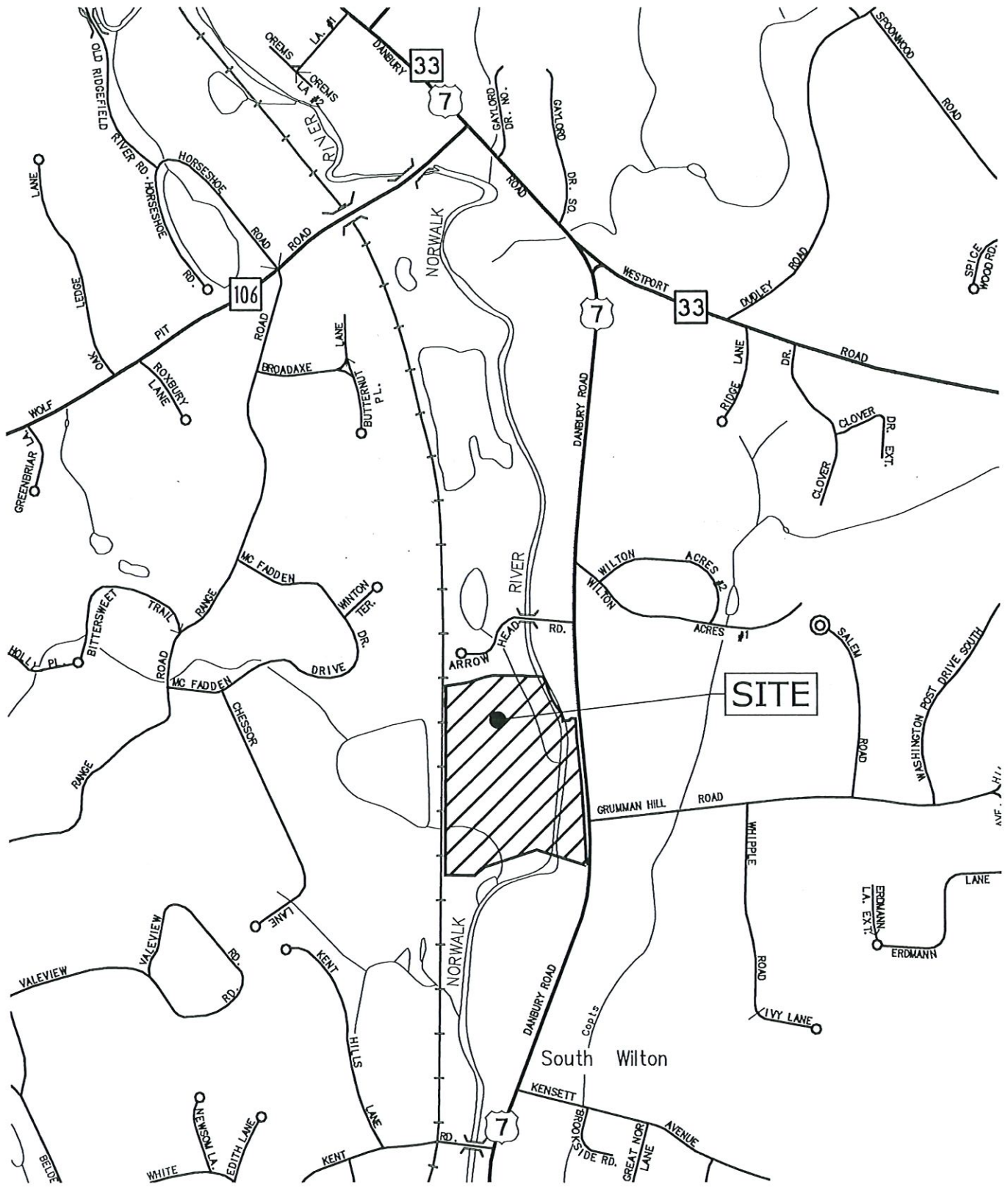


John W. Block, PE, L.S.
Senior Vice President

Enclosures: Site Location Map (Figure 1)
Traffic Volumes (Figures 2 through 7)
Collision History (Table 1)
Site-Generated Traffic Summary (Table 2)
Capacity Analysis Summary Tables (Tables 3 and 4)
Capacity Analysis Methodology Summary
Capacity Analyses Worksheets
Traffic Count Data
Parking Management Plan (Dated 09/14/2023)

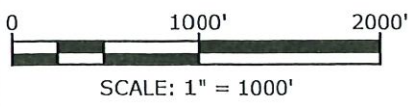
J:\A\A0969 ASML\020_Campus Master Plan\Reports\2023-09-14 ASML MICC Traffic & Parking Statement - Rev 4.docx

Aug 25, 2023-11:22am Plotted By: Dflitzgerald
Tighe & Bond, Inc. C:\Users\DFITZG-1\AppData\Local\Temp\AcPublish_5740\Site Location Map.dwg



ASML - MICC EXPANSION
WILTON, CT

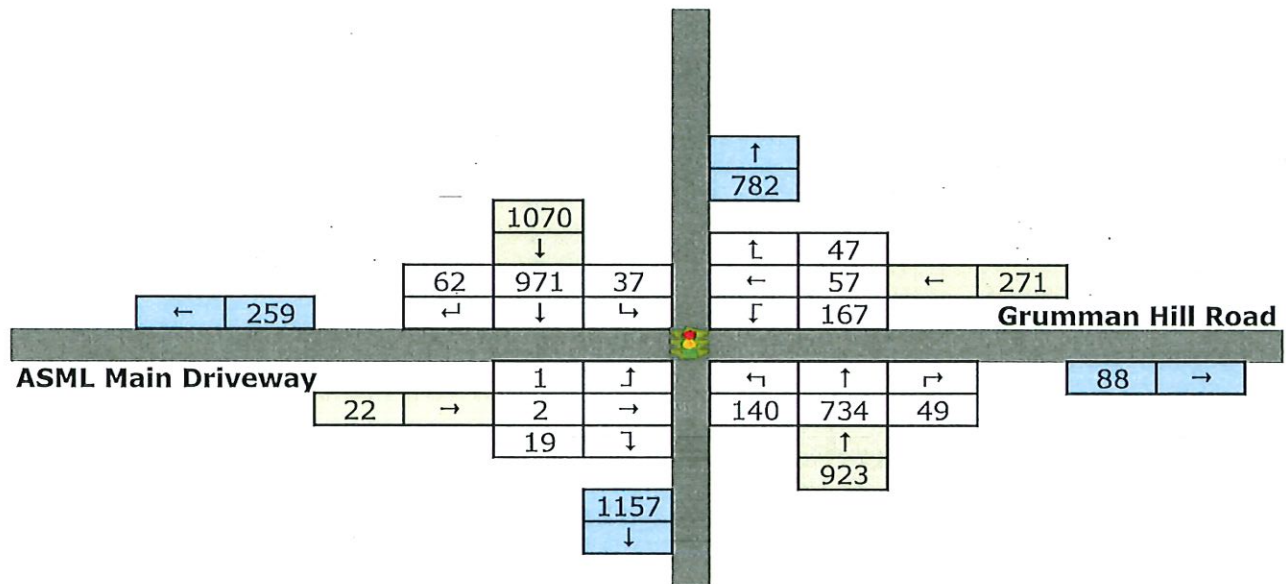
SITE LOCATION MAP



1" = 1000'

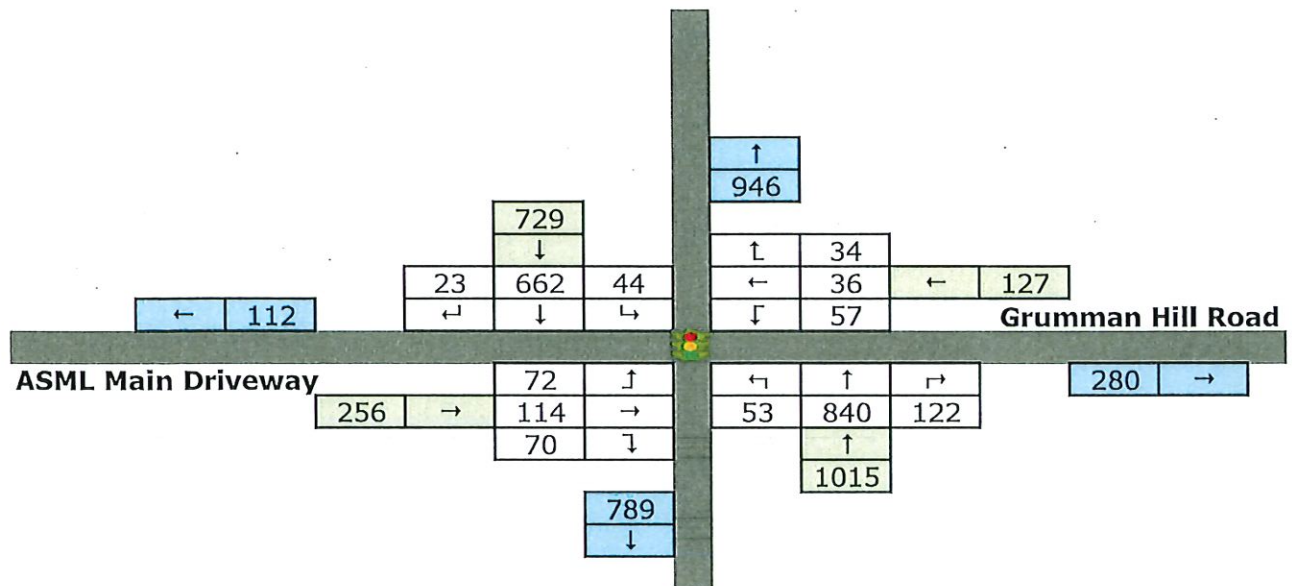
FIGURE 1





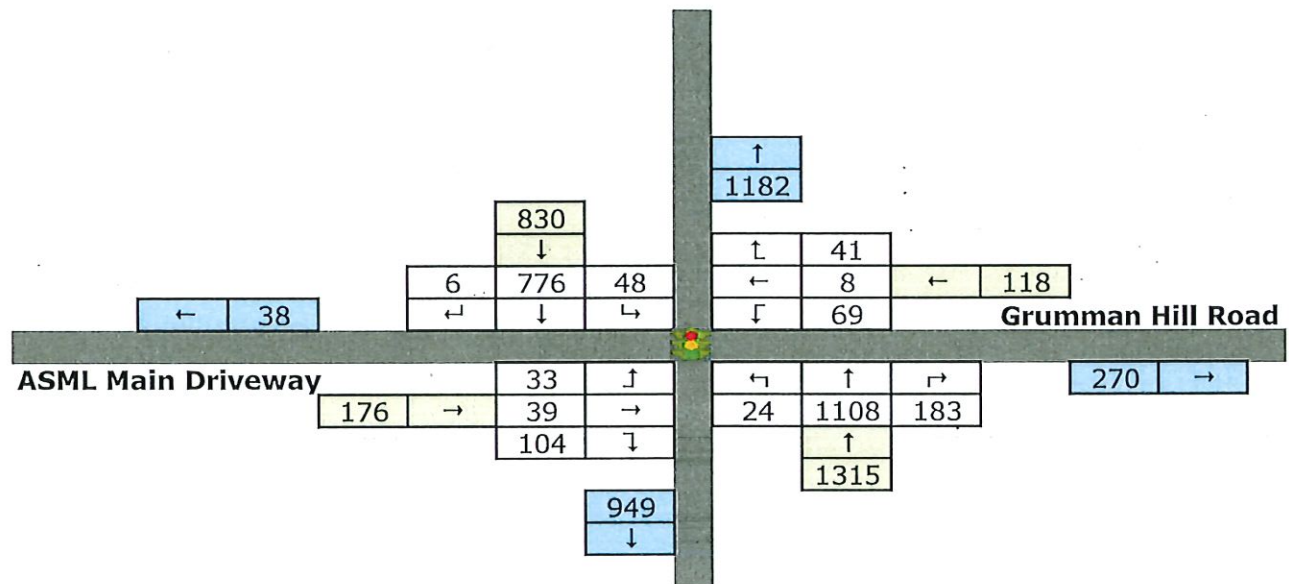
2022 Existing Conditions
Weekday Morning Peak Hour
ASML MICC Expansion

Figure 2



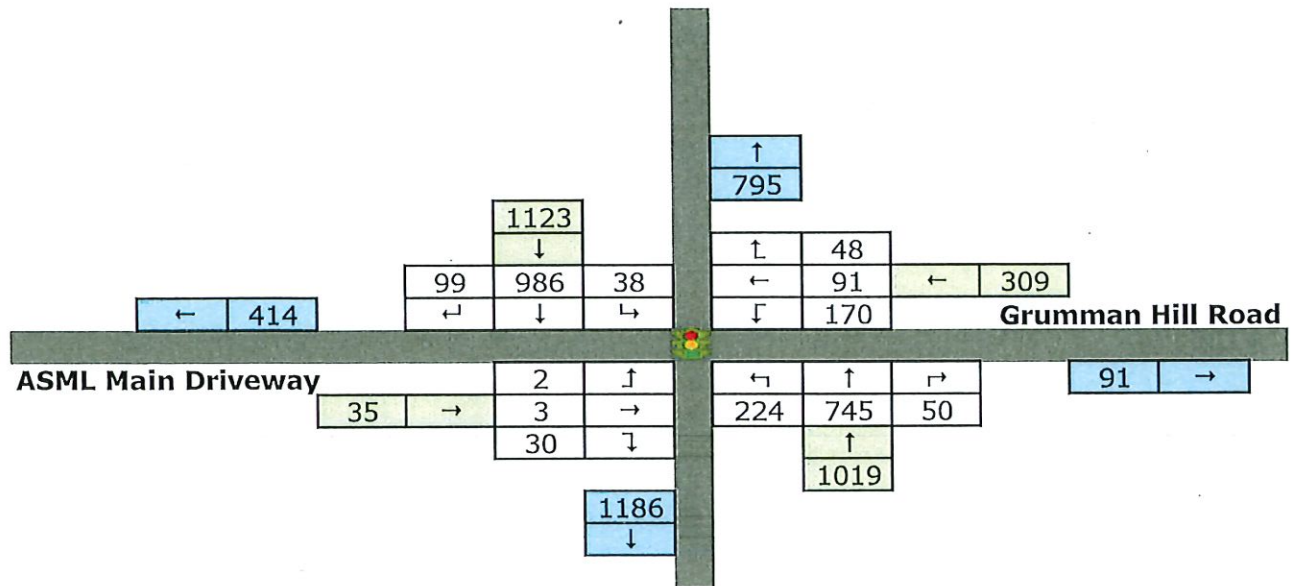
2022 Existing Conditions
Weekday Afternoon Shift Change Peak Hour
ASML MICC Expansion

Figure 3



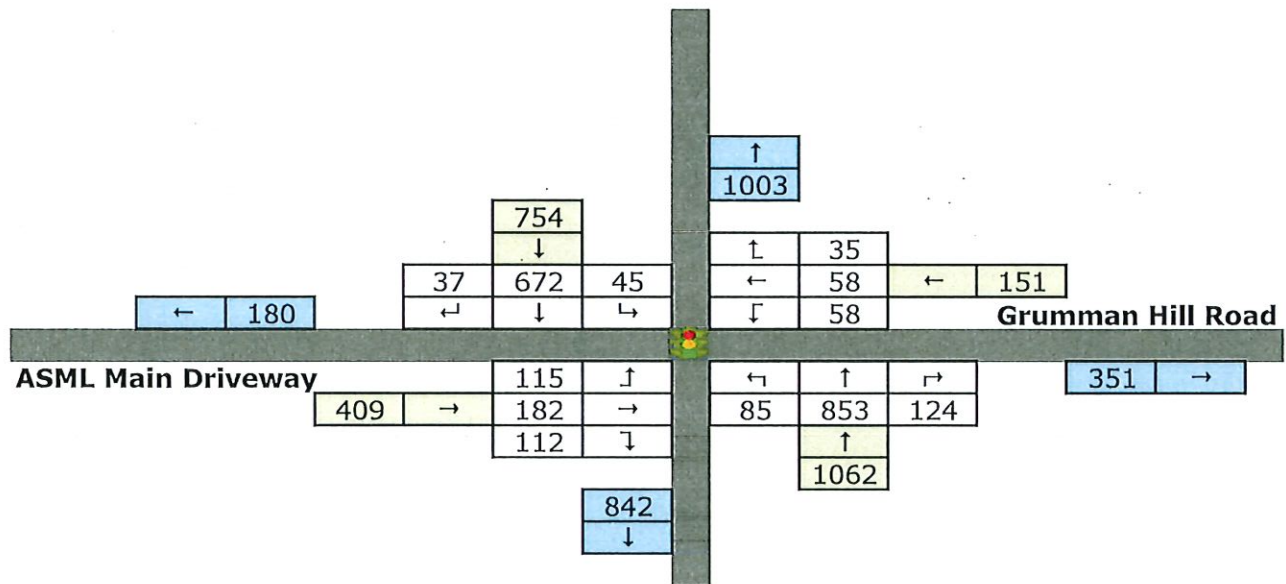
2022 Existing Conditions
Weekday Afternoon Peak Hour
ASML MICC Expansion

Figure 4



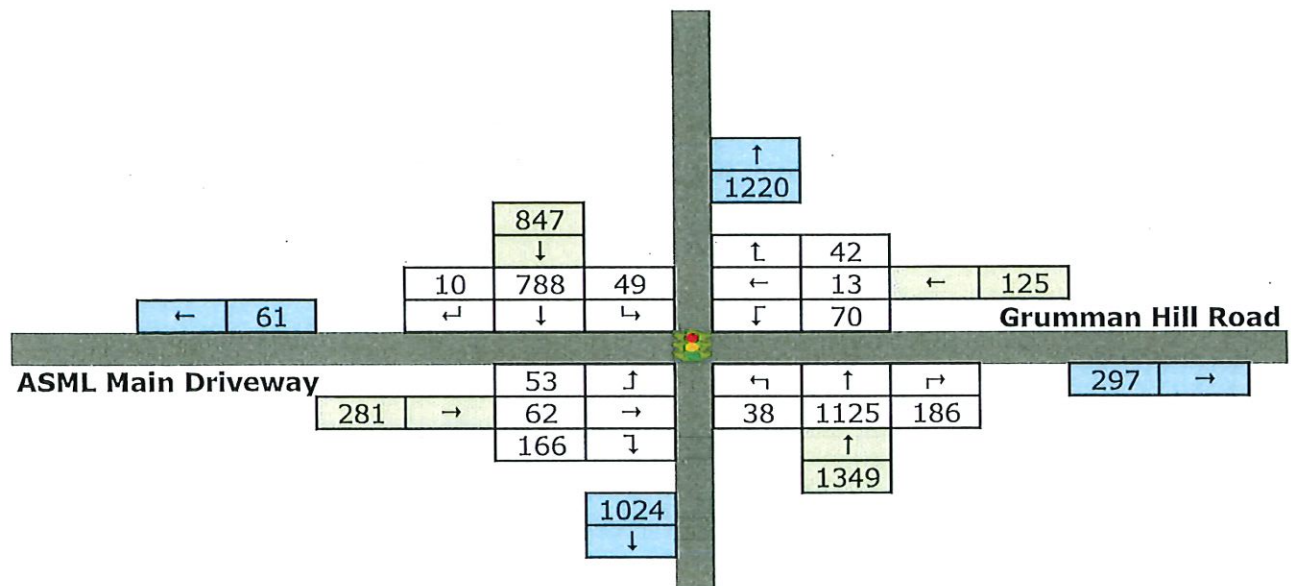
2025 Future Conditions
 Weekday Morning Peak Hour
 ASML MICC Expansion

Figure 5



2025 Future Conditions
Weekday Afternoon Shift Change Peak Hour
ASML MICC Expansion

Figure 6



2025 Future Conditions
 Weekday Afternoon Peak Hour
 ASML MICC Expansion

Figure 7

TABLE 1
Intersection Collision History Summary

Intersection: US Route 7 (Danbury Road) at ASML Driveway/Grumman Hill Road

COLLISION TYPE

	2017	2018	2019	2020	2021	2022	2023	Total	Percent
Rear-End	3	8	2	5	2	4	2	26	45.6%
Angle	5	4	3	4	1	2	2	21	36.8%
Sideswipe, Same Direction	1	4	2	3	0	0	0	10	17.5%
TOTAL	9	16	7	12	3	6	4	57	100%

CONTRIBUTING FACTOR

	2017	2018	2019	2020	2021	2022	2023	Total	Percent
None	8	13	7	8	3	5	3	47	82.5%
Backup Due to Regular Congestion	0	3	0	2	0	0	1	6	10.5%
Work Zone (construction / maintenance / utility)	0	0	0	2	0	0	0	2	3.5%
Road Surface Condition (wet, icy, snow, slush, etc.)	1	0	0	0	0	0	0	1	1.8%
TOTAL	9	16	7	12	3	6	4	57	100%

COLLISION EVENT

	2017	2018	2019	2020	2021	2022	2023	Total	Percent
Motor Vehicle	9	16	7	12	3	6	4	57	100.0%
Pedestrian / Cyclist	0	0	0	0	0	0	0	0	0.0%
TOTAL	9	16	7	12	3	6	4	57	100%

SEVERITY

	2017	2018	2019	2020	2021	2022	2023	Total	Percent
Minor Injury / Property Damage Only (PDO)	9	16	7	12	3	6	4	57	100.0%
TOTAL	9	16	7	12	3	6	4	57	100%

DAY & TIME

	2017	2018	2019	2020	2021	2022	2023	Total	Percent
Weekday 6-9 A.M.	2	2	2	1	1	1	1	10	17.5%
Weekday 3-6 P.M.	2	6	1	4	0	1	1	15	26.3%
Weekday Off-Peak	5	6	1	7	1	3	0	23	40.4%
Saturday 11 A.M. - 2 P.M.	0	0	0	0	0	1	2	3	5.3%
Weekend Off-Peak	0	2	3	0	1	0	0	6	10.5%
TOTAL	9	16	7	12	3	6	4	57	100%

WEATHER

	2017	2018	2019	2020	2021	2022	2023	Total	Percent
Clear	8	12	7	9	2	5	2	45	78.9%
Rain	1	4	0	3	1	1	1	11	19.3%
Snow	0	0	0	0	0	0	1	1	1.8%
TOTAL	9	16	7	12	3	6	4	57	100%

ROAD SURFACE CONDITION

	2017	2018	2019	2020	2021	2022	2023	Total	Percent
Dry	8	9	7	8	2	4	2	40	70.2%
Wet	1	7	0	4	1	2	2	17	29.8%
TOTAL	9	16	7	12	3	6	4	57	100%

LIGHT CONDITIONS

	2017	2018	2019	2020	2021	2022	2023	Total	Percent
Light	6	14	7	8	2	3	3	43	75.4%
Dark	3	2	0	4	1	3	1	14	24.6%
TOTAL	9	16	7	12	3	6	4	57	100%

TABLE 2

Site-Generated Traffic Summary

60% Increase from Existing Site-Generated Traffic [Used for Analyses]			
Peak Hour Period	Enter	Exit	Total
Weekday Morning	155	13	168
Weekday PM Shift Change	68	153	221
Weekday Afternoon	23	105	128

ITE Trip Generation Manual Estimate [For Comparison Purposes]			
Peak Hour Period	Enter	Exit	Total
Weekday Morning	85	26	111
Weekday PM Shift Change	57	79	136
Weekday Afternoon	38	86	124

Sources: Existing Site-Generated Traffic from Traffic Counts, 11/29/2022

Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021
Land Use - 140 [Manufacturing]

TABLE 3
Intersection Operation Summary - Capacity

Lane Use	Weekday Morning Peak Hour						Weekday Shift Change Peak Hour						Weekday Afternoon Peak Hour						
	2022 Existing			2025 Future			2022 Existing			2025 Future			2022 Existing			2025 Future			
	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	
Traffic Signal - US Route 7 (Danbury Road) at Grumman Hill Road/ASML Main Driveway																			
Overall	C	23.7	0.84	C	30.3	0.87	B	19.7	0.82	C	26.3	0.88	B	12.7	0.67	B	15.3	0.77	
ASML Main Driveway	EBLT	C	22.3	0.01	C	22.2	0.02	D	49.9	0.82	D	48.8	0.88	D	43.2	0.47	D	52.4	0.69
	EBR	A	0.4	0.08	A	2.1	0.11	B	10.7	0.28	B	14.5	0.32	B	11.0	0.44	B	10.2	0.54
Grumman Hill Road	WB	D	49.0	0.84	D	50.9	0.87	C	33.2	0.56	C	27.0	0.46	D	43.9	0.67	D	54.1	0.77
	NBL	B	17.2	0.55	D	42.7	0.80	A	7.8	0.16	B	13.3	0.36	A	3.6	0.06	A	4.4	0.11
US Route 7 (Danbury Road)	NBTR	B	13.5	0.43	B	14.5	0.45	B	15.0	0.55	C	23.0	0.71	B	10.9	0.63	B	12.1	0.66
	SBL	B	10.8	0.10	B	12.0	0.11	A	7.8	0.16	B	10.9	0.23	A	5.1	0.20	A	5.9	0.21
	SBTR	C	25.5	0.63	C	34.2	0.79	B	14.5	0.44	C	21.9	0.60	A	8.0	0.36	A	9.5	0.39

Legend

LOS - Level of Service

Delay - average delay per vehicle in seconds

V/C - volume to capacity ratio

TABLE 4
Intersection Operation Summary - Queues (In Feet)

Lane Use	Available Storage	Weekday Morning Peak Hour				Weekday Shift Change Peak Hour				Weekday Afternoon Peak Hour				
		2022 Existing		2025 Future		2022 Existing		2025 Future		2022 Existing		2025 Future		
		50 th	95 th	50 th	95 th	50 th	95 th	50 th	95 th	50 th	95 th	50 th	95 th	
Traffic Signal - US Route 7 (Danbury Road) at Grumman Hill Road/ASML Main Driveway														
ASML Main Driveway	EBLT	245	2	7	3	9	159	152	261	292	50	77	81	113
	EBR	50	0	0	0	0	12	22	38	51	0	31	0	34
Grumman Hill Road	WB	450	178	213	203	252	65	113	73	142	68	102	75	111
	NBL	115	28	79	74	264	11	25	23	35	3	10	5	16
US Route 7 (Danbury Road)	NBTR	545	141	224	154	223	199	272	248	270	224	372	246	394
	SBL	225	10	19	11	18	10	22	13	21	6	16	6	18
	SBTR	>1000	284	346	317	356	146	188	187	190	82	154	132	161

CAPACITY ANALYSIS METHODOLOGY

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).¹ The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- *LOS A* describes conditions with little to no delay to motorists.
- *LOS B* represents a desirable level with relatively low delay to motorists.
- *LOS C* describes conditions with average delays to motorists.
- *LOS D* describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- *LOS E* represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- *LOS F* is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay is used to establish the operating characteristics for an intersection or an approach to an intersection. Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a lane group's capacity at an intersection. A v/c ratio of ≥ 1.00 represents conditions when the traffic signal cycle capacity is fully utilized and indicates a capacity failure. The level-of-service criteria for signalized intersections are shown in Table A-1.

¹*Highway Capacity Manual, 6TH Edition: A Guide for Multimodal Mobility Analysis*. Washington, D.C.: Transportation Research Board, 2016.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay at an unsignalized intersection is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position.

Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a movement's capacity at an intersection. A v/c ratio of ≥ 1.00 represents conditions when the movement is fully utilized and indicates a capacity failure. The capacity of the movements is based on the distribution of gaps in the major street traffic stream, the selection of gaps to complete the desired movement, and the follow-up headways for each driver in the queue. When an unsignalized intersection is located within 0.25 miles of a signalized intersection, traffic flows may not be random and some platoon structure may exist, thereby affecting the minor street operations. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

TABLE A-1

Level-of-Service Criteria for Intersections





















Level of Service	Signalized Intersection Criteria	Unsignalized Intersection Criteria	V/C Ratio > 1.00 ^a
	Average Control Delay (Seconds per Vehicle)	Average Control Delay (Seconds per Vehicle)	
A	≤ 10	≤ 10	F
B	> 10 and ≤ 20	> 10 and ≤ 15	F
C	> 20 and ≤ 35	> 15 and ≤ 25	F
D	> 35 and ≤ 55	> 25 and ≤ 35	F
E	> 55 and ≤ 80	> 35 and ≤ 50	F
F	> 80	> 50	F

Note: ^aFor approach-based and intersection-wide assessments, LOS is defined solely by control delay.

Source: *Highway Capacity Manual, 6th Edition: A Guide for Multimodal Mobility Analysis*. Washington, D.C.: Transportation Research Board, 2016. Exhibit 19-8, Pg. 19-16.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups on the minor street approaches or to the left turns from the major street approaches.

103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
2022 Existing Conditions Weekday AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2	19	167	57	47	140	734	49	37	971	62
Future Volume (vph)	1	2	19	167	57	47	140	734	49	37	971	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	10	11	12	10	11	12
Storage Length (ft)	0		50	0		0	110		0	230		400
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			85		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.977			0.991			0.991	
Flt Protected		0.980			0.970		0.950			0.950		
Satd. Flow (prot)	0	1808	1392	0	1958	0	1452	3299	0	1668	3323	0
Flt Permitted		0.908			0.809		0.170			0.326		
Satd. Flow (perm)	0	1675	1392	0	1633	0	260	3299	0	572	3323	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86		12			10			10	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		262			353			314			1440	
Travel Time (s)		7.1			9.6			5.4			24.5	
Peak Hour Factor	0.62	0.62	0.62	0.79	0.79	0.79	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	1%	16%	1%	0%	3%	16%	5%	2%	1%	4%	5%
Adj. Flow (vph)	2	3	31	211	72	59	146	765	51	39	1011	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	31	0	342	0	146	816	0	39	1076	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		
Detector Phase	4	4	4	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.6	13.6	13.6	13.6	13.6		9.0	21.1		9.0	21.1	
Total Split (s)	33.0	33.0	33.0	33.0	33.0		10.0	47.0		10.0	47.0	
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%		11.1%	52.2%		11.1%	52.2%	
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2		3.0	4.3		3.0	4.3	
All-Red Time (s)	1.4	1.4	1.4	1.4	1.4		1.0	1.8		1.0	1.8	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.6	4.6		4.6		4.0	6.1		4.0	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Act Effct Green (s)		22.0	22.0		22.0		58.5	51.7		53.4	46.0	
Actuated g/C Ratio		0.24	0.24		0.24		0.65	0.57		0.59	0.51	
v/c Ratio		0.01	0.08		0.84		0.55	0.43		0.10	0.63	
Control Delay		22.3	0.4		49.0		17.2	13.5		10.8	25.5	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		22.3	0.4		49.0		17.2	13.5		10.8	25.5	
LOS		C	A		D		B	B		B	C	
Approach Delay		3.4			49.0			14.0			25.0	
Approach LOS		A			D			B			C	

103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
2022 Existing Conditions Weekday AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		2	0		178		28	141		10	284	
Queue Length 95th (ft)		7	0		213		#79	224		m19	m346	
Internal Link Dist (ft)		182			273			234			1360	
Turn Bay Length (ft)			50				110			230		
Base Capacity (vph)		528	498		523		267	1898		417	1712	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.01	0.06		0.65		0.55	0.43		0.09	0.63	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 10 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 23.7

Intersection LOS: C

Intersection Capacity Utilization 70.6%

ICU Level of Service C






Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.


Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road

 Ø1	 Ø2 (R)	 Ø4
10 s	47 s	33 s
 Ø5	 Ø6 (R)	
10 s	47 s	

103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
2022 Existing Conditions Weekday Shift Change

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕		↗	↕	
Traffic Volume (vph)	72	114	70	57	36	34	53	840	122	44	662	23
Future Volume (vph)	72	114	70	57	36	34	53	840	122	44	662	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	10	11	12	10	11	12
Storage Length (ft)	0		50	0		0	110		0	230		400
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			85		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.964			0.981			0.995	
Flt Protected		0.981			0.978		0.950			0.950		
Satd. Flow (prot)	0	1811	1392	0	1946	0	1452	3272	0	1668	3338	0
Flt Permitted		0.796			0.521		0.295			0.224		
Satd. Flow (perm)	0	1469	1392	0	1037	0	451	3272	0	393	3338	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86		19			27			6	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		262			353			314			1440	
Travel Time (s)		7.1			9.6			5.4			24.5	
Peak Hour Factor	0.61	0.61	0.61	0.82	0.82	0.82	0.95	0.95	0.95	0.86	0.86	0.86
Heavy Vehicles (%)	6%	1%	16%	1%	0%	3%	16%	5%	2%	1%	4%	5%
Adj. Flow (vph)	118	187	115	70	44	41	56	884	128	51	770	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	305	115	0	155	0	56	1012	0	51	797	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		
Detector Phase	4	4	4	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.6	13.6	13.6	13.6	13.6		9.0	21.1		9.0	21.1	
Total Split (s)	26.0	26.0	26.0	26.0	26.0		10.0	54.0		10.0	54.0	
Total Split (%)	28.9%	28.9%	28.9%	28.9%	28.9%		11.1%	60.0%		11.1%	60.0%	
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2		3.0	4.3		3.0	4.3	
All-Red Time (s)	1.4	1.4	1.4	1.4	1.4		1.0	1.8		1.0	1.8	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.6	4.6		4.6		4.0	6.1		4.0	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Act Effct Green (s)		22.8	22.8		22.8		56.3	50.7		55.2	48.8	
Actuated g/C Ratio		0.25	0.25		0.25		0.63	0.56		0.61	0.54	
v/c Ratio		0.82	0.28		0.56		0.16	0.55		0.16	0.44	
Control Delay		49.9	10.7		33.2		7.8	15.0		7.8	14.5	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		49.9	10.7		33.2		7.8	15.0		7.8	14.5	
LOS		D	B		C		A	B		A	B	
Approach Delay		39.2			33.2			14.6			14.1	
Approach LOS		D			C			B			B	

103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
 2022 Existing Conditions Weekday Shift Change

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		159	12		65		11	199		10	146	
Queue Length 95th (ft)		152	22		113		25	272		22	188	
Internal Link Dist (ft)		182			273			234			1360	
Turn Bay Length (ft)			50				110			230		
Base Capacity (vph)		389	432		289		349	1936		328	1899	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.78	0.27		0.54		0.16	0.52		0.16	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 30 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 19.7

Intersection LOS: B

Intersection Capacity Utilization 57.3%

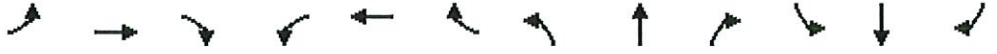
ICU Level of Service B

Analysis Period (min) 15













Splits and Phases: 103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road



103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
2022 Existing Conditions Weekday PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕		↗	↕	
Traffic Volume (vph)	33	39	104	69	8	41	24	1108	183	48	776	6
Future Volume (vph)	33	39	104	69	8	41	24	1108	183	48	776	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	10	11	12	10	11	12
Storage Length (ft)	0		50	0		0	110		0	230		400
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			85		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.953			0.979			0.999	
Flt Protected		0.978			0.972		0.950			0.950		
Satd. Flow (prot)	0	1799	1392	0	1905	0	1452	3267	0	1668	3352	0
Flt Permitted		0.787			0.768		0.319			0.138		
Satd. Flow (perm)	0	1448	1392	0	1505	0	488	3267	0	242	3352	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			133		28			31			1	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		262			353			314			1440	
Travel Time (s)		7.1			9.6			5.4			24.5	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.91	0.91	0.91	0.92	0.92	0.92
Heavy Vehicles (%)	6%	1%	16%	1%	0%	3%	16%	5%	2%	1%	4%	5%
Adj. Flow (vph)	42	50	133	88	10	53	26	1218	201	52	843	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	92	133	0	151	0	26	1419	0	52	850	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		
Detector Phase	4	4	4	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.6	13.6	13.6	13.6	13.6		9.0	21.1		9.0	21.1	
Total Split (s)	26.0	26.0	26.0	26.0	26.0		10.0	54.0		10.0	54.0	
Total Split (%)	28.9%	28.9%	28.9%	28.9%	28.9%		11.1%	60.0%		11.1%	60.0%	
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2		3.0	4.3		3.0	4.3	
All-Red Time (s)	1.4	1.4	1.4	1.4	1.4		1.0	1.8		1.0	1.8	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.6	4.6		4.6		4.0	6.1		4.0	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Act Effct Green (s)		12.1	12.1		12.1		66.7	61.6		67.8	63.5	
Actuated g/C Ratio		0.13	0.13		0.13		0.74	0.68		0.75	0.71	
v/c Ratio		0.47	0.44		0.67		0.06	0.63		0.20	0.36	
Control Delay		43.2	11.0		43.9		3.6	10.9		5.1	8.0	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		43.2	11.0		43.9		3.6	10.9		5.1	8.0	
LOS		D	B		D		A	B		A	A	
Approach Delay		24.1			43.9			10.7			7.8	
Approach LOS		C			D			B			A	

103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
 2022 Existing Conditions Weekday PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		50	0		68		3	224		6	82	
Queue Length 95th (ft)		77	31		102		10	372		m16	m154	
Internal Link Dist (ft)		182			273			234			1360	
Turn Bay Length (ft)			50				110			230		
Base Capacity (vph)		344	432		379		428	2244		277	2365	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.27	0.31		0.40		0.06	0.63		0.19	0.36	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 30 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 12.7

Intersection LOS: B

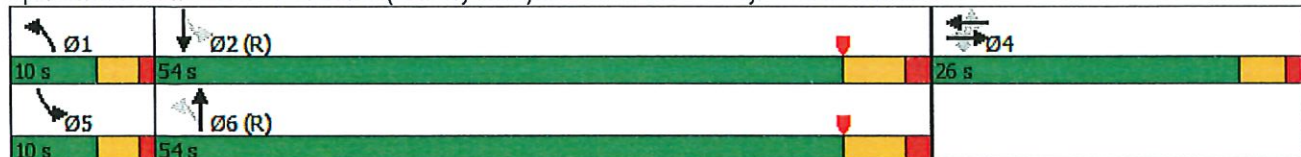
Intersection Capacity Utilization 62.2%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.













Splits and Phases: 103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road



103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
2025 Future Conditions Weekday AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Volume (vph)	2	3	30	170	91	48	224	745	50	38	986	99
Future Volume (vph)	2	3	30	170	91	48	224	745	50	38	986	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	10	11	12	10	11	12
Storage Length (ft)	0		50	0		0	110		0	230		400
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			85		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.979			0.991			0.986	
Flt Protected		0.982			0.973		0.950			0.950		
Satd. Flow (prot)	0	1814	1392	0	1971	0	1452	3300	0	1668	3306	0
Flt Permitted		0.909			0.825		0.115			0.340		
Satd. Flow (perm)	0	1679	1392	0	1671	0	176	3300	0	597	3306	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86		11			10			16	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		262			353			314			1440	
Travel Time (s)		7.1			9.6			5.4			24.5	
Peak Hour Factor	0.62	0.62	0.62	0.79	0.79	0.79	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	1%	16%	1%	0%	3%	16%	5%	2%	1%	4%	5%
Adj. Flow (vph)	3	5	48	215	115	61	233	776	52	40	1027	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	48	0	391	0	233	828	0	40	1130	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		
Detector Phase	4	4	4	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.6	13.6	13.6	13.6	13.6		9.0	21.1		9.0	21.1	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		10.0	48.0		10.0	48.0	
Total Split (%)	35.6%	35.6%	35.6%	35.6%	35.6%		11.1%	53.3%		11.1%	53.3%	
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2		3.0	4.3		3.0	4.3	
All-Red Time (s)	1.4	1.4	1.4	1.4	1.4		1.0	1.8		1.0	1.8	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.6	4.6		4.6		4.0	6.1		4.0	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Act Effct Green (s)		23.7	23.7		23.7		56.2	49.9		46.1	38.7	
Actuated g/C Ratio		0.26	0.26		0.26		0.62	0.55		0.51	0.43	
v/c Ratio		0.02	0.11		0.87		0.80	0.45		0.11	0.79	
Control Delay		22.2	2.1		50.9		42.7	14.5		12.0	34.2	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		22.2	2.1		50.9		42.7	14.5		12.0	34.2	
LOS		C	A		D		D	B		B	C	
Approach Delay		5.0			50.9			20.7			33.4	
Approach LOS		A			D			C			C	

103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
2025 Future Conditions Weekday AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		3	0		203		74	154		11	317	
Queue Length 95th (ft)		9	0		252		#264	223		m18	m356	
Internal Link Dist (ft)		182			273			234			1360	
Turn Bay Length (ft)			50				110			230		
Base Capacity (vph)		514	485		519		292	1834		381	1547	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.02	0.10		0.75		0.80	0.45		0.10	0.73	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 10 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 30.3

Intersection LOS: C

Intersection Capacity Utilization 78.9%

ICU Level of Service D






Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

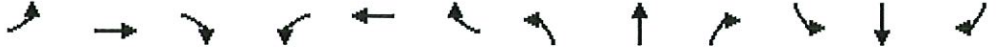







Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.


Splits and Phases: 103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road

	Ø1		Ø2 (R)		Ø4
10 s		43 s		32 s	
	Ø5		Ø6 (R)		
10 s		43 s			

103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
2025 Future Conditions Weekday Shift Change

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	182	112	58	58	35	85	853	124	45	672	37
Future Volume (vph)	115	182	112	58	58	35	85	853	124	45	672	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	10	11	12	10	11	12
Storage Length (ft)	0		50	0		0	110		0	230		400
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			85		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.969			0.981			0.992	
Flt Protected		0.981			0.981		0.950			0.950		
Satd. Flow (prot)	0	1811	1392	0	1965	0	1452	3272	0	1668	3327	0
Flt Permitted		0.788			0.515		0.229			0.163		
Satd. Flow (perm)	0	1454	1392	0	1032	0	350	3272	0	286	3327	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86		15			29			10	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		262			353			314			1440	
Travel Time (s)		7.1			9.6			5.4			24.5	
Peak Hour Factor	0.61	0.61	0.61	0.82	0.82	0.82	0.95	0.95	0.95	0.86	0.86	0.86
Heavy Vehicles (%)	6%	1%	16%	1%	0%	3%	16%	5%	2%	1%	4%	5%
Adj. Flow (vph)	189	298	184	71	71	43	89	898	131	52	781	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	487	184	0	185	0	89	1029	0	52	824	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		
Detector Phase	4	4	4	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.6	13.6	13.6	13.6	13.6		9.0	21.1		9.0	21.1	
Total Split (s)	24.0	24.0	24.0	24.0	24.0		10.0	56.0		10.0	56.0	
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		11.1%	62.2%		11.1%	62.2%	
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2		3.0	4.3		3.0	4.3	
All-Red Time (s)	1.4	1.4	1.4	1.4	1.4		1.0	1.8		1.0	1.8	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.6	4.6		4.6		4.0	6.1		4.0	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Act Effct Green (s)		34.3	34.3		34.3		44.9	39.2		43.6	37.0	
Actuated g/C Ratio		0.38	0.38		0.38		0.50	0.44		0.48	0.41	
v/c Ratio		0.88	0.32		0.46		0.36	0.71		0.23	0.60	
Control Delay		48.8	14.5		27.0		13.3	23.0		10.9	21.9	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		48.8	14.5		27.0		13.3	23.0		10.9	21.9	
LOS		D	B		C		B	C		B	C	
Approach Delay		39.4			27.0			22.2			21.3	
Approach LOS		D			C			C			C	

103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
 2025 Future Conditions Weekday Shift Change

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		261	38		73		23	248		13	187	
Queue Length 95th (ft)		#292	51		142		35	270		21	190	
Internal Link Dist (ft)		182			273			234			1360	
Turn Bay Length (ft)			50				110			230		
Base Capacity (vph)		553	582		402		248	1827		231	1849	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.88	0.32		0.46		0.36	0.56		0.23	0.45	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 30 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 26.3

Intersection LOS: C

Intersection Capacity Utilization 72.1%

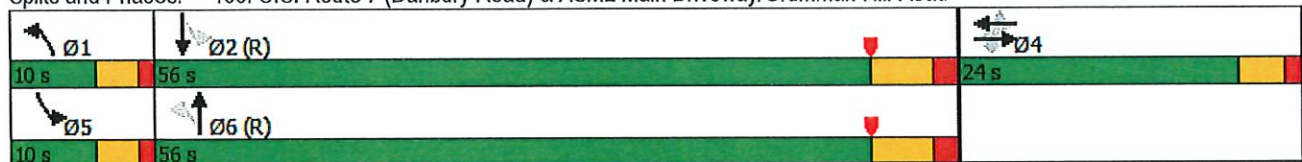
ICU Level of Service C

Analysis Period (min) 15

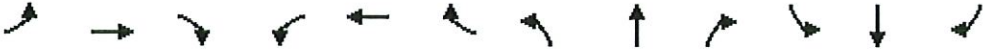
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.













Splits and Phases: 103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road






103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
2025 Future Conditions Weekday PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕		↗	↕	
Traffic Volume (vph)	53	62	166	70	13	42	38	1125	186	49	788	10
Future Volume (vph)	53	62	166	70	13	42	38	1125	186	49	788	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	10	11	12	10	11	12
Storage Length (ft)	0		50	0		0	110		0	230		400
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			85		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.955			0.979			0.998	
Flt Protected		0.977			0.973		0.950			0.950		
Satd. Flow (prot)	0	1797	1392	0	1912	0	1452	3267	0	1668	3348	0
Flt Permitted		0.764			0.626		0.301			0.132		
Satd. Flow (perm)	0	1405	1392	0	1230	0	460	3267	0	232	3348	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			213		26			34			2	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		262			353			314			1440	
Travel Time (s)		7.1			9.6			5.4			24.5	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.91	0.91	0.91	0.92	0.92	0.92
Heavy Vehicles (%)	6%	1%	16%	1%	0%	3%	16%	5%	2%	1%	4%	5%
Adj. Flow (vph)	68	79	213	90	17	54	42	1236	204	53	857	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	147	213	0	161	0	42	1440	0	53	868	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		
Detector Phase	4	4	4	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.6	13.6	13.6	13.6	13.6		9.0	21.1		9.0	21.1	
Total Split (s)	24.0	24.0	24.0	24.0	24.0		9.0	57.0		9.0	57.0	
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		10.0%	63.3%		10.0%	63.3%	
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2		3.0	4.3		3.0	4.3	
All-Red Time (s)	1.4	1.4	1.4	1.4	1.4		1.0	1.8		1.0	1.8	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.6	4.6		4.6		4.0	6.1		4.0	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Act Effct Green (s)		13.6	13.6		13.6		65.4	60.2		65.4	60.2	
Actuated g/C Ratio		0.15	0.15		0.15		0.73	0.67		0.73	0.67	
v/c Ratio		0.69	0.54		0.77		0.11	0.66		0.21	0.39	
Control Delay		52.4	10.2		54.1		4.4	12.1		5.9	9.5	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		52.4	10.2		54.1		4.4	12.1		5.9	9.5	
LOS		D	B		D		A	B		A	A	
Approach Delay		27.4			54.1			11.8			9.3	
Approach LOS		C			D			B			A	

103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road
2025 Future Conditions Weekday PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		81	0		75		5	246		6	132	
Queue Length 95th (ft)		113	34		111		16	394		m18	m161	
Internal Link Dist (ft)		182			273			234			1360	
Turn Bay Length (ft)			50				110			230		
Base Capacity (vph)		302	467		285		389	2197		249	2240	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.49	0.46		0.56		0.11	0.66		0.21	0.39	
Intersection Summary												
Area Type:	Other											
Cycle Length: 90												
Actuated Cycle Length: 90												
Offset: 30 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.77												
Intersection Signal Delay: 15.3							Intersection LOS: B					
Intersection Capacity Utilization 63.4%							ICU Level of Service B					
Analysis Period (min) 15												
m Volume for 95th percentile queue is metered by upstream signal.												

Splits and Phases: 103: U.S. Route 7 (Danbury Road) & ASML Main Driveway/Grumman Hill Road

 Ø1	 Ø2 (R)	 Ø4
9 s	57 s	24 s
 Ø5	 Ø6 (R)	
9 s	57 s	

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Route 7 at Gunman Hill Road/ASML Dr
Wilton, Connecticut

File Name : 23810
Site Code : 23810
Start Date : 11/29/2022
Page No : 1

Groups Printed- Lights - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

Start Time	Route 7 From North					Gunman Hill Road From East					Route 7 From South					ASML Drive From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
12:00 AM	0	8	0	0	8	0	0	2	0	2	0	13	0	0	13	2	3	1	0	6	29
12:15 AM	0	8	0	0	8	0	0	1	0	1	1	24	4	0	29	0	2	0	0	2	40
12:30 AM	0	3	1	0	4	0	0	0	0	0	3	13	1	0	17	2	0	0	0	2	23
12:45 AM	0	8	1	0	9	1	0	1	0	2	2	8	0	0	10	2	1	0	0	3	24
Total	0	27	2	0	29	1	0	4	0	5	6	58	5	0	69	6	6	1	0	13	116
01:00 AM	0	10	1	0	11	0	0	0	0	0	0	8	1	0	9	0	0	0	0	0	20
01:15 AM	1	8	0	0	9	0	0	0	0	0	1	6	0	0	7	4	0	1	0	5	21
01:30 AM	0	5	0	0	5	0	0	1	0	1	0	7	1	0	8	0	0	0	0	0	14
01:45 AM	0	5	0	0	5	0	0	0	0	0	0	1	2	0	3	0	0	0	0	0	8
Total	1	28	1	0	30	0	0	1	0	1	1	22	4	0	27	4	0	1	0	5	63
02:00 AM	0	1	0	0	1	0	0	0	0	0	0	12	3	0	15	3	0	0	0	3	19
02:15 AM	0	9	0	0	9	0	0	0	0	0	0	6	1	0	7	0	0	0	0	0	16
02:30 AM	1	4	0	0	5	0	0	0	0	0	0	7	0	0	7	0	1	0	0	1	13
02:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	14	0	0	15	0	0	0	0	0	0	25	4	0	29	3	1	0	0	4	48
03:00 AM	0	2	0	0	2	0	1	0	0	1	0	4	0	0	4	0	0	0	0	0	7
03:15 AM	0	2	1	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
03:30 AM	0	8	0	0	8	0	0	1	0	1	0	7	1	0	8	0	0	0	0	0	17
03:45 AM	0	7	0	0	7	0	1	1	0	2	0	5	0	0	5	1	0	1	0	2	16
Total	0	19	1	0	20	0	2	2	0	4	0	19	1	0	20	1	0	1	0	2	46
04:00 AM	1	10	0	0	11	0	2	0	0	2	0	7	2	0	9	1	0	0	0	1	23
04:15 AM	6	11	0	0	17	0	0	2	0	2	0	5	2	0	7	0	0	0	0	0	26
04:30 AM	6	27	0	0	33	1	1	0	0	2	1	9	0	0	10	0	0	0	0	0	45
04:45 AM	10	26	0	0	36	1	5	1	0	7	0	14	6	0	20	2	1	0	0	3	66
Total	23	74	0	0	97	2	8	3	0	13	1	35	10	0	46	3	1	0	0	4	160
05:00 AM	8	46	0	0	54	1	2	1	0	4	0	21	3	0	24	0	0	1	0	1	83
05:15 AM	20	63	0	0	83	3	19	4	0	26	0	27	15	0	42	2	2	0	0	4	155
05:30 AM	29	97	2	0	128	1	25	13	0	39	1	35	22	0	58	1	1	0	0	2	227
05:45 AM	39	93	0	0	132	0	26	27	0	53	2	36	37	0	75	9	6	0	0	15	275
Total	96	299	2	0	397	5	72	45	0	122	3	119	77	0	199	12	9	1	0	22	740
06:00 AM	15	119	1	0	135	0	17	16	0	33	2	63	10	0	75	9	5	6	0	20	263
06:15 AM	9	171	0	0	180	1	13	11	0	25	4	99	19	0	122	7	5	9	0	21	348
06:30 AM	11	236	1	0	248	2	17	9	0	28	1	110	13	0	124	10	21	14	0	45	445
06:45 AM	10	226	3	0	239	3	9	17	0	29	2	129	16	0	147	3	4	1	0	8	423
Total	45	752	5	0	802	6	56	53	0	115	9	401	58	0	468	29	35	30	0	94	1479
07:00 AM	16	230	3	0	249	5	5	21	0	31	3	128	15	1	147	2	3	1	0	6	433
07:15 AM	10	240	3	1	254	7	7	22	0	36	8	147	27	0	182	4	1	2	1	8	480
07:30 AM	25	234	1	0	260	8	17	32	1	58	5	202	30	0	237	7	2	1	0	10	565
07:45 AM	17	236	6	0	259	16	16	54	0	86	11	191	39	1	242	2	0	0	0	2	589
Total	68	940	13	1	1022	36	45	129	1	211	27	668	111	2	808	15	6	4	1	26	2067
08:00 AM	9	253	10	1	273	12	16	39	0	67	11	168	44	2	225	5	0	0	1	6	571
08:15 AM	11	248	20	1	280	11	8	42	0	61	22	173	27	3	225	5	0	0	2	7	573
08:30 AM	6	197	11	1	215	20	8	31	1	60	16	175	31	3	225	7	1	1	2	11	511
08:45 AM	10	209	13	0	232	21	12	46	1	80	14	200	24	7	245	19	0	2	0	21	578
Total	36	907	54	3	1000	64	44	158	2	268	63	716	126	15	920	36	1	3	5	45	2233

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Groups Printed- Lights - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

Start Time	Route 7 From North					Gunman Hill Road From East					Route 7 From South					ASML Drive From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
09:00 AM	2	220	8	0	230	11	5	49	1	66	10	168	17	5	200	24	1	1	0	26	522
09:15 AM	2	203	6	2	213	8	1	31	1	41	10	147	7	11	175	13	0	2	0	15	444
09:30 AM	4	240	3	0	247	9	1	26	0	36	9	169	8	4	190	11	0	1	0	12	485
09:45 AM	2	173	5	0	180	7	2	15	0	24	12	152	12	2	178	12	1	0	0	13	395
Total	10	836	22	2	870	35	9	121	2	167	41	636	44	22	743	60	2	4	0	66	1846
10:00 AM	1	180	6	0	187	8	1	9	1	19	4	139	9	2	154	8	0	0	0	8	368
10:15 AM	1	179	7	0	187	8	3	20	1	32	12	148	4	1	165	6	1	3	0	10	394
10:30 AM	3	169	4	0	176	8	1	11	0	20	8	136	8	0	152	6	0	3	0	9	357
10:45 AM	0	155	3	0	158	3	1	18	1	23	10	143	7	4	164	7	0	5	0	12	357
Total	5	683	20	0	708	27	6	58	3	94	34	566	28	7	635	27	1	11	0	39	1476
11:00 AM	3	154	7	0	164	4	2	6	0	12	16	172	3	2	193	3	5	2	0	10	379
11:15 AM	3	164	2	0	169	6	2	11	0	19	15	167	7	2	191	6	2	4	0	12	391
11:30 AM	2	173	6	0	181	4	2	10	0	16	12	158	7	3	180	15	1	2	0	18	395
11:45 AM	3	176	7	1	187	4	2	16	1	23	21	156	8	7	192	15	2	2	1	20	422
Total	11	667	22	1	701	18	8	43	1	70	64	653	25	14	756	39	10	10	1	60	1587
12:00 PM	0	166	9	0	175	12	4	16	0	32	19	170	7	2	198	16	2	1	0	19	424
12:15 PM	0	185	3	0	188	18	0	17	4	39	13	148	12	8	181	5	1	2	0	8	416
12:30 PM	3	171	9	0	183	10	5	7	0	22	17	196	8	10	231	3	0	2	0	5	441
12:45 PM	0	186	8	0	194	6	3	11	1	21	19	215	15	3	252	16	1	0	0	17	484
Total	3	708	29	0	740	46	12	51	5	114	68	729	42	23	862	40	4	5	0	49	1765
01:00 PM	1	173	7	0	181	4	2	14	1	21	15	204	6	4	229	7	2	1	0	10	441
01:15 PM	4	177	11	0	192	8	5	15	1	29	16	165	15	7	203	15	2	3	1	21	445
01:30 PM	1	167	6	0	174	6	5	18	0	29	23	204	14	5	246	7	4	4	0	15	464
01:45 PM	5	198	12	0	215	5	4	17	0	26	11	199	13	6	229	20	7	5	0	32	502
Total	11	715	36	0	762	23	16	64	2	105	65	772	48	22	907	49	15	13	1	78	1852
02:00 PM	2	168	6	0	176	6	6	18	0	30	20	192	10	1	223	8	14	6	0	28	457
02:15 PM	2	169	8	0	179	6	7	10	2	25	24	219	14	3	260	11	15	11	0	37	501
02:30 PM	9	169	2	0	180	5	12	12	0	29	28	202	20	0	250	31	48	24	0	103	562
02:45 PM	11	160	14	0	185	4	14	17	0	35	31	208	10	2	251	19	27	23	1	70	541
Total	24	666	30	0	720	21	39	57	2	119	103	821	54	6	984	69	104	64	1	238	2061
03:00 PM	1	164	20	1	186	19	3	18	0	40	39	211	9	0	259	9	24	14	2	49	534
03:15 PM	2	202	20	0	224	25	0	21	1	47	35	232	5	0	272	12	14	7	0	33	576
03:30 PM	3	188	16	0	207	13	0	17	0	30	29	234	8	2	273	9	17	12	0	38	548
03:45 PM	0	176	8	0	184	5	1	13	0	19	38	205	3	2	248	9	10	6	0	25	476
Total	6	730	64	1	801	62	4	69	1	136	141	882	25	4	1052	39	65	39	2	145	2134
04:00 PM	0	191	9	0	200	13	0	15	0	28	30	234	1	2	267	16	9	6	1	32	527
04:15 PM	1	173	13	1	188	13	1	12	1	27	44	270	3	8	325	18	9	8	1	36	576
04:30 PM	0	192	14	1	207	15	1	13	1	30	45	252	1	8	306	25	11	17	0	53	596
04:45 PM	0	181	5	1	187	17	0	20	2	39	51	296	9	6	362	26	17	12	2	57	645
Total	1	737	41	3	782	58	2	60	4	124	170	1052	14	24	1260	85	46	43	4	178	2344
05:00 PM	1	210	15	0	226	10	2	16	0	28	45	234	3	12	294	31	9	8	0	48	596
05:15 PM	3	177	15	0	195	6	4	15	0	25	55	305	5	2	367	25	10	4	0	39	626
05:30 PM	2	208	13	0	223	8	2	18	1	29	32	273	7	0	312	22	3	9	0	34	598
05:45 PM	1	199	15	0	215	8	4	11	0	23	44	288	12	6	350	21	5	8	0	34	622
Total	7	794	58	0	859	32	12	60	1	105	176	1100	27	20	1323	99	27	29	0	155	2442
06:00 PM	1	186	8	0	195	9	2	8	0	19	34	219	7	2	262	25	14	9	0	48	524
06:15 PM	2	169	10	0	181	9	0	13	0	22	33	184	7	6	230	13	4	10	0	27	460
06:30 PM	0	98	6	0	104	1	0	8	0	9	28	184	8	2	222	7	1	1	0	9	344

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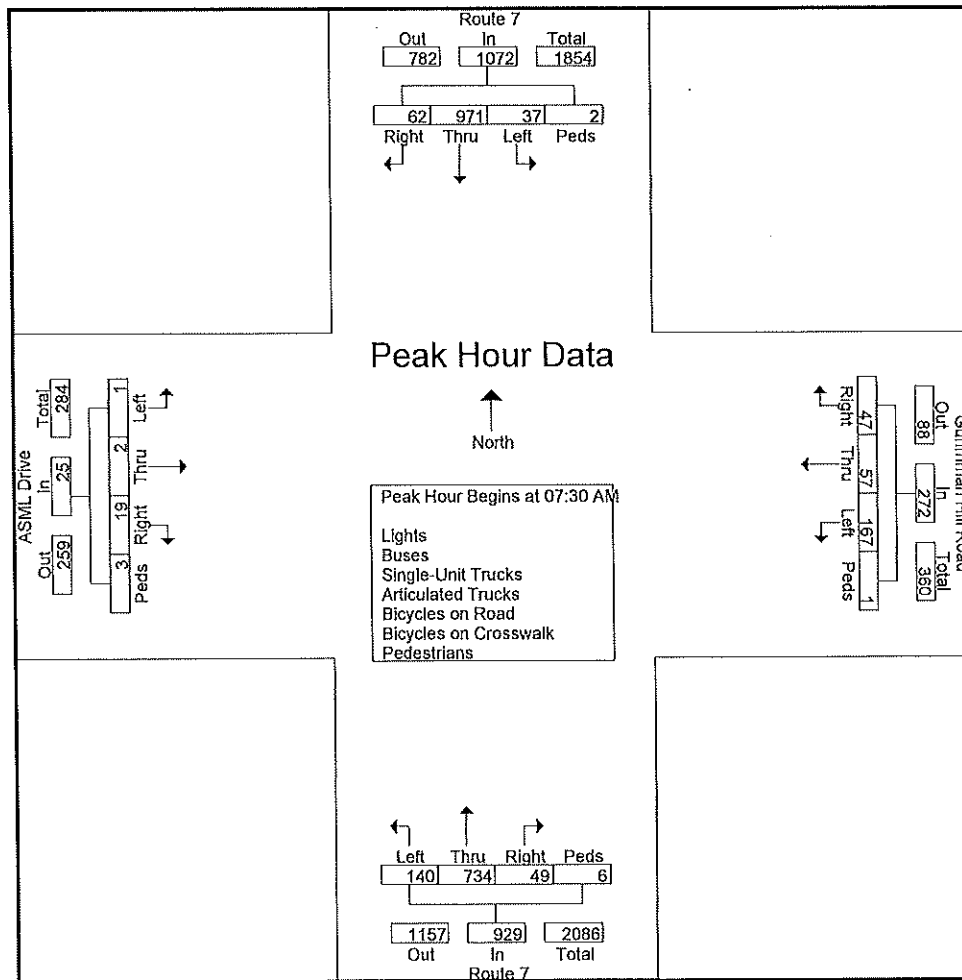
Groups Printed- Lights - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	Route 7 From North					Gunnman Hill Road From East					Route 7 From South					ASML Drive From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Inl. Total
06:45 PM	1	102	4	0	107	5	1	7	0	13	25	194	3	1	223	6	2	4	0	12	355
Total	4	555	28	0	587	24	3	36	0	63	120	781	25	11	937	51	21	24	0	96	1683
07:00 PM	0	110	8	0	118	3	0	3	1	7	14	187	4	1	206	3	2	0	0	5	336
07:15 PM	1	103	3	0	107	3	0	19	1	23	13	157	5	1	176	3	0	3	0	6	312
07:30 PM	0	113	3	0	116	2	0	5	0	7	13	130	4	1	148	4	3	4	0	11	282
07:45 PM	1	89	0	0	90	4	2	8	0	14	14	136	1	1	152	19	0	8	0	27	283
Total	2	415	14	0	431	12	2	35	2	51	54	610	14	4	682	29	5	15	0	49	1213
08:00 PM	0	101	5	0	106	2	0	7	0	9	19	130	1	0	150	8	0	1	0	9	274
08:15 PM	1	91	6	0	98	3	1	5	0	9	14	128	3	1	146	3	1	1	0	5	258
08:30 PM	0	80	0	0	80	1	1	1	0	3	11	89	1	0	101	0	1	2	0	3	187
08:45 PM	3	83	10	0	96	3	0	5	0	8	11	104	4	0	119	2	0	0	0	2	225
Total	4	355	21	0	380	9	2	18	0	29	55	451	9	1	516	13	2	4	0	19	944
09:00 PM	2	76	3	0	81	1	1	2	0	4	9	92	1	1	103	2	0	0	0	2	190
09:15 PM	9	52	1	0	62	1	6	1	0	8	5	94	2	0	101	2	1	0	0	3	174
09:30 PM	10	56	4	0	70	2	5	0	0	7	6	70	3	0	79	5	0	1	0	6	162
09:45 PM	8	47	3	0	58	2	7	5	0	14	10	73	8	0	91	5	1	1	0	7	170
Total	29	231	11	0	271	6	19	8	0	33	30	329	14	1	374	14	2	2	0	18	696
10:00 PM	2	48	1	0	51	2	1	2	0	5	5	58	4	0	67	7	1	3	0	11	134
10:15 PM	0	37	0	0	37	1	0	0	0	1	8	52	2	0	62	4	9	5	0	18	118
10:30 PM	1	33	1	0	35	0	1	2	0	3	6	57	1	1	65	9	3	6	0	18	121
10:45 PM	0	17	0	0	17	1	0	3	0	4	5	48	1	0	54	7	1	0	0	8	83
Total	3	135	2	0	140	4	2	7	0	13	24	215	8	1	248	27	14	14	0	55	456
11:00 PM	0	30	0	0	30	0	0	0	0	0	0	39	0	0	39	2	3	1	0	6	75
11:15 PM	0	17	0	0	17	2	0	1	0	3	8	31	1	0	40	8	7	2	0	17	77
11:30 PM	0	13	0	0	13	0	1	1	0	2	1	24	0	0	25	17	13	9	0	39	79
11:45 PM	0	16	0	0	16	0	0	0	0	0	2	23	1	0	26	5	5	2	0	12	54
Total	0	76	0	0	76	2	1	2	0	5	11	117	2	0	130	32	28	14	0	74	285
Grand Total	390	11363	476	11	12240	493	364	1084	26	1967	1266	11777	775	177	13995	782	405	332	15	1534	29736
Approch %	3.2	92.8	3.9	0.1		25.1	18.5	55.1	1.3		9	84.2	5.5	1.3		51	26.4	21.6	1		
Total %	1.3	38.2	1.6	0	41.2	1.7	1.2	3.6	0.1	6.6	4.3	39.6	2.6	0.6	47.1	2.6	1.4	1.1	0.1	5.2	
Lights	371	10860			11721			1069			1246	11229			13136						28146
% Lights	95.1	95.7	98.7	0	95.8	97.2	99.7	98.6	7.7	97.3	98.4	95.3	84.4	4	93.9	84.5	99.5	94	0	89.7	94.7
Buses	0	72	2	0	74	7	0	0	0	7	1	65	89	0	155	89	0	0	0	89	325
% Buses	0	0.6	0.4	0	0.6	1.4	0	0	0	0.4	0.1	0.6	11.5	0	1.1	11.4	0	0	0	5.8	1.1
Single-Unit Trucks																					
% Single-Unit Trucks	3.1	2.6	0.6	0	2.5	1.4	0.3	1.2	0	1.1	1.4	2.7	2.7	0	2.5	3.1	0.5	3	0	2.3	2.4
Articulated Trucks	7	119	1	0	127	0	0	2	0	2	1	167	11	0	179	7	0	10	0	17	325
% Articulated Trucks	1.8	1	0.2	0	1	0	0	0.2	0	0.1	0.1	1.4	1.4	0	1.3	0.9	0	3	0	1.1	1.1
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0
Bicycles on Crosswalk	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	3
% Bicycles on Crosswalk	0	0	0	9.1	0	0	0	0	3.8	0.1	0	0	0	0.6	0	0	0	0	0	0	0
Pedestrians	0	0	0	10	10	0	0	0	23	23	0	0	0	169	169	0	0	0	15	15	217
% Pedestrians	0	0	0	90.9	0.1	0	0	0	88.5	1.2	0	0	0	95.5	1.2	0	0	0	100	1	0.7

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	Route 7 From North					Gunmman Hill Road From East					Route 7 From South					ASML Drive From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	25	234	1	0	260	8	17	32	1	58	5	202	30	0	237	7	2	1	0	10	565
07:45 AM	17	236	6	0	259	16	16	54	0	86	11	191	39	1	242	2	0	0	0	2	589
08:00 AM	9	253	10	1	273	12	16	39	0	67	11	168	44	2	225	5	0	0	1	6	571
08:15 AM	11	248	20	1	280	11	8	42	0	61	22	173	27	3	225	5	0	0	2	7	573
Total Volume	62	971	37	2	1072	47	57	167	1	272	49	734	140	6	929	19	2	1	3	25	2298
% App. Total	5.8	90.6	3.5	0.2		17.3	21	61.4	0.4		5.3	79	15.1	0.6		76	8	4	12		
PHF	.620	.959	.463	.500	.957	.734	.838	.773	.250	.791	.557	.908	.795	.500	.960	.679	.250	.250	.375	.625	.975



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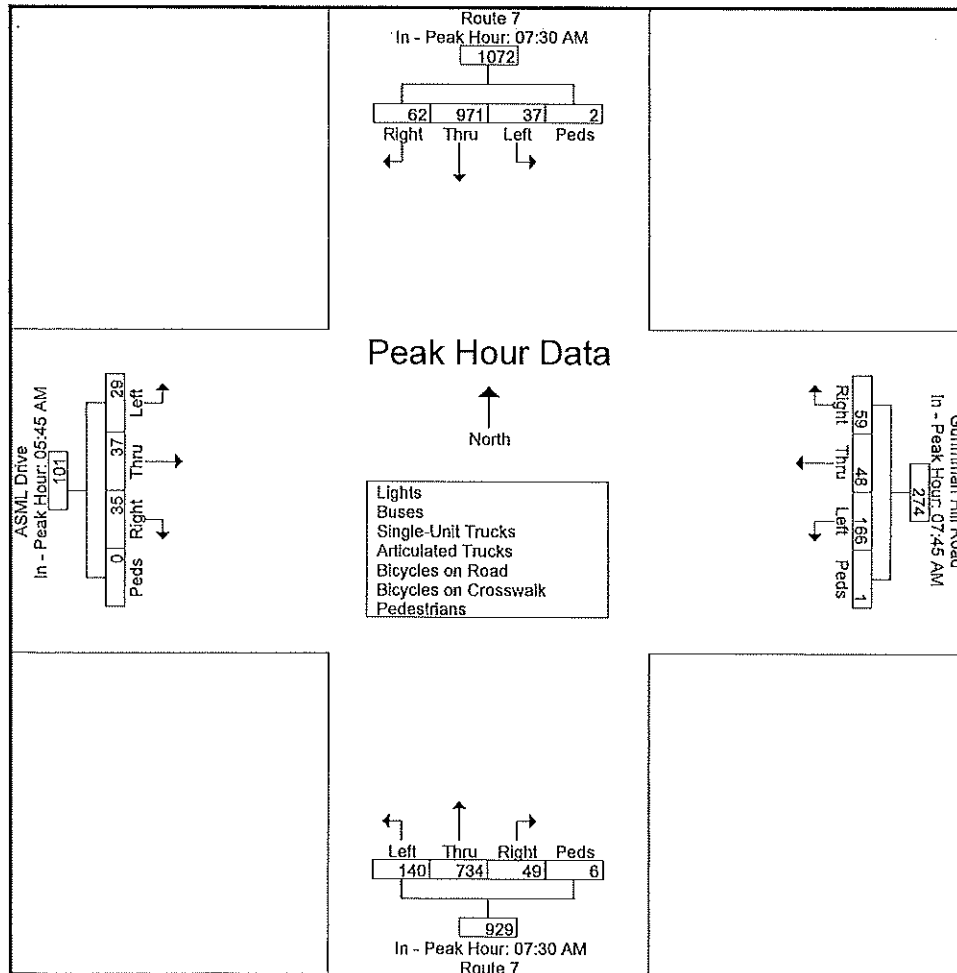
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Start Time	Route 7 From North					Gunman Hill Road From East					Route 7 From South					ASML Drive From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 12:00 AM to 09:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM					07:45 AM					07:30 AM					05:45 AM					
+0 mins.	25	234	1	0	260	16	16	54	0	86	5	202	30	0	237	9	6	0	0	15	
+15 mins.	17	236	6	0	259	12	16	39	0	67	11	191	39	1	242	9	5	6	0	20	
+30 mins.	9	253	10	1	273	11	8	42	0	61	11	168	44	2	225	7	5	9	0	21	
+45 mins.	11	248	20	1	280	20	8	31	1	60	22	173	27	3	225	10	21	14	0	45	
Total Volume	62	971	37	2	1072	59	48	166	1	274	49	734	140	6	929	35	37	29	0	101	
% App. Total	5.8	90.6	3.5	0.2		21.5	17.5	60.6	0.4		5.3	79	15.1	0.6		34.7	36.6	28.7	0		
PHF	.620	.959	.463	.500	.957	.738	.750	.769	.250	.797	.557	.908	.795	.500	.960	.875	.440	.518	.000	.561	

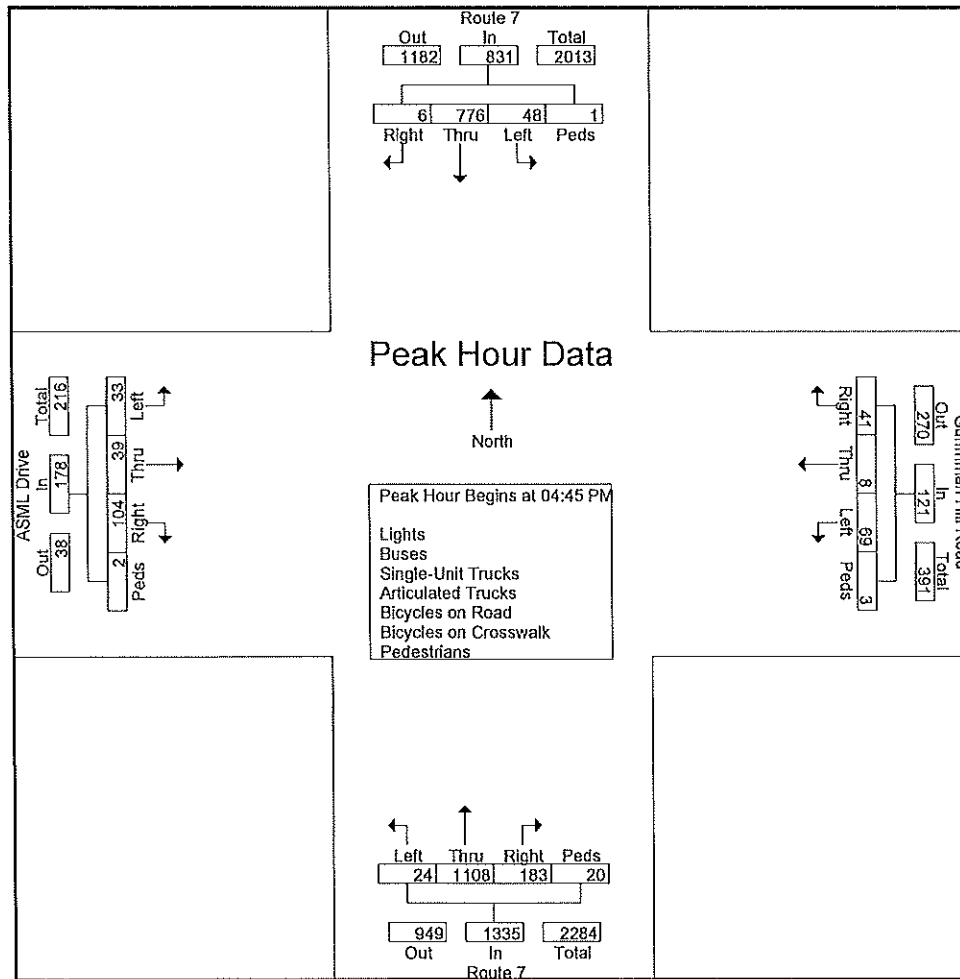


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	Route 7 From North					Gunman Hill Road From East					Route 7 From South					ASML Drive From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 11:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	181	5	1	187	17	0	20	2	39	51	296	9	6	362	26	17	12	2	57	645
05:00 PM	1	210	15	0	226	10	2	16	0	28	45	234	3	12	294	31	9	8	0	48	596
05:15 PM	3	177	15	0	195	6	4	15	0	25	55	305	5	2	367	25	10	4	0	39	626
05:30 PM	2	208	13	0	223	8	2	18	1	29	32	273	7	0	312	22	3	9	0	34	598
Total Volume	6	776	48	1	831	41	8	69	3	121	183	1108	24	20	1335	104	39	33	2	178	2465
% App. Total	0.7	93.4	5.8	0.1		33.9	6.6	57	2.5		13.7	83	1.8	1.5		58.4	21.9	18.5	1.1		
PHF	.500	.924	.800	.250	.919	.603	.500	.863	.375	.776	.832	.908	.667	.417	.909	.839	.574	.688	.250	.781	.955



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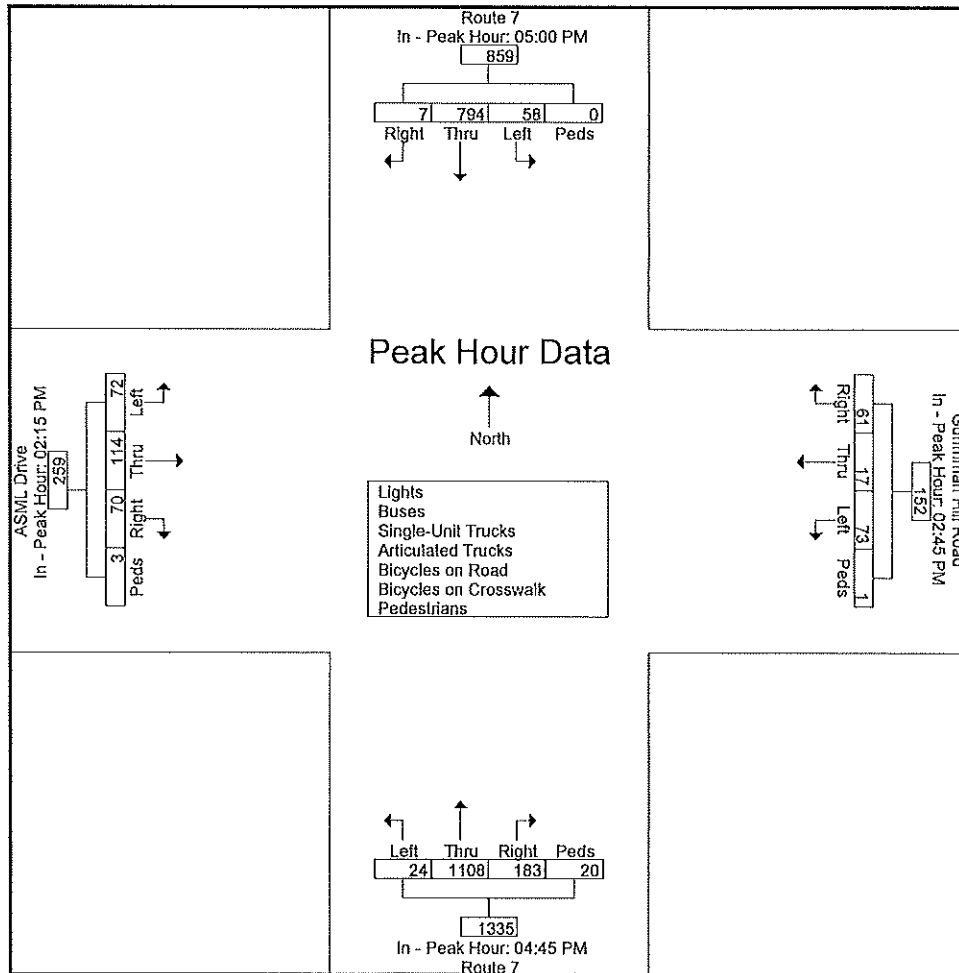
File Name : 23810
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Start Time	Route 7 From North					Gunman Hill Road From East					Route 7 From South					ASML Drive From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 02:00 PM to 11:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM					02:45 PM					04:45 PM					02:15 PM				
+0 mins.	1	210	15	0	226	4	14	17	0	35	51	296	9	6	362	11	15	11	0	37
+15 mins.	3	177	15	0	195	19	3	18	0	40	45	234	3	12	294	31	48	24	0	103
+30 mins.	2	208	13	0	223	25	0	21	1	47	55	305	5	2	367	19	27	23	1	70
+45 mins.	1	199	15	0	215	13	0	17	0	30	32	273	7	0	312	9	24	14	2	49
Total Volume	7	794	58	0	859	61	17	73	1	152	183	1108	24	20	1335	70	114	72	3	259
% App. Total	0.8	92.4	6.8	0		40.1	11.2	48	0.7		13.7	83	1.8	1.5		27	44	27.8	1.2	
PHF	.583	.945	.967	.000	.950	.610	.304	.869	.250	.809	.832	.908	.667	.417	.909	.565	.594	.750	.375	.629



Parking Management Plan

ASML – 77 Danbury Road, Wilton CT

Updated 09/14/2023

The following document details the Parking Management Plan (PMP) prepared for the ASML campus located at addresses 77 & 71 Danbury Road, which are part of the 77 Danbury Road parcel. ASML is committed to providing sufficient parking for their employees and visitors and this plan details how parking is managed. The following sections detail the building development summary, parking requirements, parking supply, shuttle service to the off-site parking supply, travel and parking demand management strategies, and finally a statement from ASML on the current state of parking operations.

Building Development Summary & Parking Requirements

The following table details the existing and proposed development at the 77 Danbury Road Site as well as the associated parking requirements.

TABLE 1

ASML Development Summary & Parking Requirements

Location	Building Gross Floor Area (GFA; Square Feet)	Required Parking
Existing Conditions		
77 Danbury Road	375,789	940
71 Danbury Road	12,853	32
Outdoor Storage (4,000 square feet)	--	4
Total	388,642	976
Proposed Conditions		
MICC (Lower Levels of Expansion)	90,200	226
Upper Levels of Expansion	76,836	192
Total	167,036	418
Future (Following Proposed Expansion)		
Existing	388,642	976
Proposed	167,036	418
Total	555,678	1,394

Reference:

Parking requirements based on Wilton Zoning Regulations Section 29-8.B: 1 space per 400 GFA of Manufacturing plus 1 space per 1,000 square feet of outdoor storage area.

Parking Supply & Operations

ASML provides both on-site and off-site parking to satisfy the parking demand needs of the 77 Danbury Road site. The 77 Danbury Road parcel has 901 on-site parking spaces while 20 Westport Road provides an additional 1,141 off-site parking spaces for a total of 2,042 spaces. Parking on-site is for employees/visitors of 77 Danbury Road only and parking availability will be managed by the following two approaches:

1. **Reducing Existing 77 Danbury Road Headcount:** ASML is transferring existing employees of 77 Danbury Road to work at the 20 Westport Road site to increase available on-site parking for employees of the expansion. By the end of 2023, up to 600 employees are expected to be transferred.
2. **Remote Parking with Shuttle Service:** ASML is assigning employees to park off-site at 20 Westport Road and provide shuttle service to/from 77 Danbury Road (See following section). The shuttle also circulates through 50 and 59 Danbury Road, where ASML currently leases building space, and 407 and 75 parking spaces, respectively. A map of the parking supply locations and shuttle route is attached (Figure 1).

TABLE 2
ASML Parking Supply Summary

Location	Parking Spaces
71 & 77 Danbury Road	901
20 Westport Road	1,141
Total	2,042

Shuttle Service

ASML operates shuttle services connecting the 77 Danbury Road with other ASML facilities in Wilton. Currently, 3 shuttle buses are in operation as detailed in Table 3 below, with the route shown in Figure 1 attached. The number of shuttle buses and frequency of the service is adjusted periodically based on peak ridership coinciding with the shift change periods, which occur between 5:15 AM and 9:00 AM and 2:30 to 5:30 PM. Adjustments to the operations will be made as necessary.

TABLE 3
ASML Shuttle Schedule

Shuttle/Location	Operating Hours
Shuttle 1	
B20 to B77 to B50	7:00 AM to 10:00 AM (B50 Drop-Off Only)
B77 to B59 to B50 to B20	10:00 AM to 3:00 PM
B50 to B20	3:00 PM to 6:00 PM (B50 Pick-Up Only)
Shuttle 2	
B20 to B77	5:30 AM to 10:00 AM
B77 to B59 to B50	10:00 AM to 3:00 PM
B77 to B20	3:00 PM to 11:00 PM
Shuttle 3	
B20 to B77	5:30 AM to 12:00 AM

Key:

B20 = 20 Westport Rd; **B50** = 50 Danbury Rd; **B59** = 59 Danbury Rd; **B77** = 77 Danbury Rd

Parking and Travel Demand Management

ASML implements a parking and travel demand management program with its employees. Existing and new employees are encouraged to take advantage of the health and incentive benefits of the program, which aims to reduce the traffic volumes accessing and parking demand of the ASML facilities. The ASML Parking and Travel Demand Management program, is comprised of the following strategies:

- a) Local off-site parking with shuttle service between ASML campuses.
- b) Organization of a carpooling/vanpooling program for employees in similar geographies utilizing Connecticut parking and ride locations. ASML records indicate that there are at least 10 local communities with over 50 employees.
- c) Promotion of CT Rides Program that provides state-sponsored incentives to those that commute with greener transportation options.
- d) Emergency ride home program to allow employees who have carpooled or commuted without a vehicle to get a ride to their vehicle or other destination.
- e) Stated remote work policy for certain employees to reduce peak traffic and parking demand.
- f) Distribution of information to employees about alternative commuting options and incentives to promote use.
- g) On-demand parking management systems tracking the real-time availability of parking within facilities to allow for diversion of vehicles to areas with available spaces.

Periodic Reporting

ASML will submit periodic updates to the Wilton Planning and Zoning Department for review by the Director. This plan will be updated at least annually commencing with the issuance of the certificate of occupancy and certificate of zoning compliance and/or when parking demand reaches 80 percent of capacity at 20 Westport Road, providing current information on the parking operations of the site. The subsequent updates of the PMP will include a statement from ASML addressing the following:

- 1. Statement that current parking operations are sufficient to meet demand.
- 2. Statement that shuttle operations are running effectively.
- 3. Efficacy statement on travel and parking demand management strategies employed.
- 4. Summary of any parking complaints (internal and external).
- 5. Summary of ASML's current use and occupancy of the properties served by this PMP.
- 6. Summary of ASML's intended additional construction, if any.

Conclusion

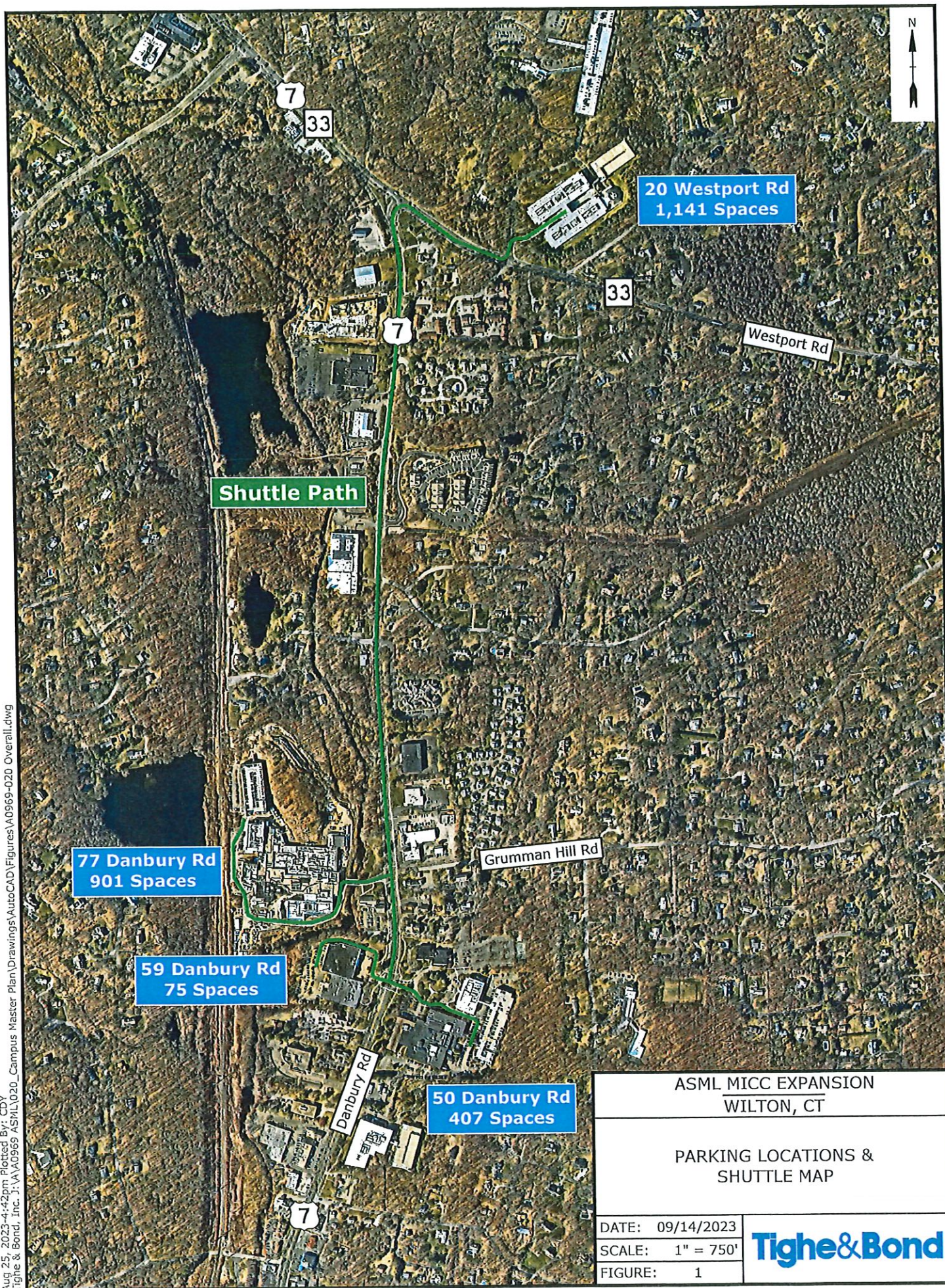
ASML is committed to providing sufficient parking for their employees and visitors. Through the implementation of this Parking Management Plan, ASML will control the parking operations of the 77 Danbury Road facility. The parking supply of 2,042 parking spaces through 901 on-site and 1,141 off-site parking spaces will be utilized, which exceeds the required parking of 1,394 parking spaces.

ASML will monitor and manage parking demand at both the 77 Danbury Road and 20 Westport Road facilities as the expansion is completed and employee growth is realized and adjust this plan accordingly. At a minimum, the plan will be updated annually and/or when parking demand reaches 90 percent of capacity commencing with the issuance of the certificate of occupancy and certificate of zoning compliance.

Further master planning efforts are underway for ASML within Wilton and additional parking supply both on- and off-site will be considered to ensure that future parking needs are met.

Enclosures:

Parking Locations & Shuttle Map (Figure 1)



ASML MICC EXPANSION
WILTON, CT

PARKING LOCATIONS &
SHUTTLE MAP

DATE: 09/14/2023
SCALE: 1" = 750'
FIGURE: 1

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