TRAFFIC ENGINEERING EVALUATION

619 MARIN BLVD
PROPOSED MIXED-USE DEVELOPMENT
BLOCK 7103, LOTS 2 – 8, 11
16TH & MARIN BOULEVARD
CITY OF JERSEY CITY
HUDSON COUNTY, NEW JERSEY

Prepared for:

Real Shelter for All
619 Marin Blvd
Jersey City, NJ 07310

Prepared by:

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KLEIN
TRAFFIC CONSULTING, LLC

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EXECUTIVE SUMMARY

Klein Traffic Consulting, LLC was engaged to prepare a Traffic Engineering Evaluation report for the proposed 619 Marin Boulevard project, located in the block bounded by Grove Street, Marin Boulevard, 16th Street, and 15th Street. The proposal is to demolish the existing structures and construct 613 new multifamily housing (high-rise) units and approximately 5,100 square feet of commercial space on the street level. This redevelopment project will include 200 on-site parking spaces, including 188 mechanical parking spaces and 30 electric vehicle charging spaces (EVCS) and 2 ADA compliant parking spaces in a garage with driveway access via 16th Street.

The trip generation calculations are based on the Institute of Transportation Engineers (ITE), *Trip Generation, 11th Edition*. The land use Multifamily Housing (High-Rise) dense multi-use urban area average trip generation rates were used to calculate the trip generation. The land use Strip Retail Plaza (less than 40,000 SF) was used to calculate the trips of the proposed retail portion was used to calculate the trips. The overall project would generate 159 new vehicle trips during the AM peak hour (67 in and 92 out) and 126 trips during the PM peak hour (63 in and 63 out). The residential portion would generate 209 walk, bike, transit trips during the AM peak hour (94 in and 115 out) and 160 walk, bike, transit trips during the PM peak hour (72 in and 88 out).

The trip distribution of the site-generated trips was determined based on the proposed driveway location on 16th Street and the existing travel patterns in the study area. The signalized intersection of Grove Street with 16th Street and STOP-controlled intersection of 16th Street with Marin Boulevard were determined to be necessary for this traffic study.

The traffic from other developments in the area that would generate traffic at the studied intersections were included in the appropriate background growth factor, which was applied to the existing traffic volumes to determine the future No-Build traffic volumes.

Based upon our data collection efforts, analyses, and evaluations, it is our professional opinion that the vehicular traffic generated by the proposed 613 units of multifamily housing (high-rise) and 5,100 square feet of retail space would have a negligible impact on traffic conditions during the AM and PM peak commuter traffic hours. The studied intersections are expected to continue to operate at acceptable Levels of Service. Any increase in average vehicle delay would be imperceptible to the motoring public. No mitigation measures are required at either of the studied intersections.

The proposed parking supply of 200 parking spaces is 201 parking spaces less than the maximum parking requirement of 401 parking spaces, based on 0.5 parking space per bedroom and 0.5 parking space per 1,000 square feet of retail space. The retail portion of the development is permitted to have a maximum of 5 parking spaces.

Per the Zoning Ordinance, based on the size of the office space, a loading dock is required. The proposed on-site loading dock will also be available for move-in/move-out of the residential and retail tenants. However, trucks will be required to reverse into the loading dock, rather than "head-in" to the loading dock. Then trucks exiting the loading dock would be "head-out." Trash and recycling pick-up will take place at the loading dock. Typical deliveries by UPS/FedEx/Amazon for residents and retail will occur along 16th Street. The proposed on-site loading dock accommodates truck activities with a longer duration.

The proposed design of the site would more than adequately serve the needs of the project's residents. The site plan is designed with adequate parking and circulation for the residents, visitors and services associated with the project. Access to the parking garage via one, two-way driveway is adequate to serve the proposed traffic demand. Conveniently located near mass transportation options and proposing private shuttle bus service, most of the trips generated by the proposed apartments would be pedestrian trips utilizing mass transportation.

In conclusion, the development of this project advances the goals of the Jersey Avenue Light Rail Redevelopment Plan and will have no significant impact on the traffic operations of the area roadways and intersections.

INTRODUCTION

The purpose of this Traffic Engineering Evaluation is to assess the traffic impacts associated with the redevelopment of the subject property known as Block 7103, Lots 2-8, and 11 located at 619 Grove Street in the City of Jersey City, Hudson County, NJ. The proposal is to redevelop the site with 613 multifamily housing (high-rise) units and 5,100 square feet of retail space with parking for up to 200 parking spaces in 188 mechanical parking spaces and 12 surface parking spaces.

Project Description

During the initial phase of the project, the Applicant is proposing to demolish the existing buildings and construct a new fifteen-story mixed-use building on Block 7102, Lots 2-8, and 11 with 176 studio units, 309 one-bedroom units, 80 two-bedroom units, and 48 three-bedroom units and 5,100 square feet of retail space, with an enclosed parking garage with parking for up to 200 vehicles. The location of the project site is illustrated in Figure 1 Location Map.

The redevelopment project is located between Grove Street, 16th Street, 15th Street, and Marin Boulevard within the Jersey Avenue Light Rail Redevelopment Plan and is consistent with the Redevelopment Plan objectives and is well suited to take advantage of mass transportation options. This project follows sound land use planning goals and objectives. The roadway network provides good access to the region.

Scope of Study

Based on the layout of the proposed driveway access point, the following two intersections are included in our scope of the traffic study for this Traffic Engineering Evaluation (TEE):

- Grove Street with 16th Street (signalized)
- Marin Boulevard with 16th Street (STOP-controlled)

Based on the large residential portion and relatively small amount of commercial space of the proposed development project, the scope of study was limited to the weekday AM peak period and the PM peak period.

Methodology

The following methodology was used to prepare this Traffic Engineering Evaluation (TEE) in accordance with industry accepted standards:

Conducted field reconnaissance of the study roadway network to inventory traffic control devices, regulatory signing, intersection and roadway geometry, and other factors that are factors in the traffic analyses.

Obtained the official traffic signal timing for the signalized intersections of Grove Street with 16th Street and 16th Street with Marin Boulevard.

Collected AM and PM peak period intersection traffic turning movement counts (TMCs) at the studied intersections.

Tabulated, adjusted, balanced, and summarized the traffic volumes to establish the 2022 Existing AM and PM peak hour traffic volumes.

Identified the appropriate background growth factor, the traffic generated from other specific developments in the studied area and determined the future year of occupancy of the development to project the future No-Build AM and PM peak hour traffic volumes.

Calculated the vehicular and pedestrian (walk, bike, transit) trip generation estimates of the proposed development project using the accepted data in the Institute of Transportation Engineers (ITE), *Trip Generation, 11th Edition,* determined pass-by percentages for the retail trips.

Determined the trip distribution patterns for the development trips based on existing patterns of traffic volumes.

Assigned the site-generated vehicle trips to the studied roadway network and site driveway according to the trip distribution percentages.

Added the site-generated trips to the future No-Build traffic volumes to calculate the future Build traffic volumes.

Performed intersection capacity analyses for the weekday AM and PM peak hours for the Existing, future No-Build and future Build traffic volumes.

Followed the requirements of Jersey City Ordinance 345-17 Traffic impact assessment.

EXISTING CONDITIONS

The site is located between Grove Street, 16th Street, 15th Street, and Main Boulevard. The surrounding properties consist of a mix of commercial and residential uses.

Roadways

The adjacent roadways serving the site are described as follows:

Grove Street

Grove Street is categorized as an urban minor arterial under the jurisdiction of the City of Jersey City. Grove Street is oriented in a southbound direction, extending between 16th Street in the north and Grand Street in the south. North of 16th Street, Grove Street is two-way. Near the proposed site, Grove Street provides two travel lanes. Parking is permitted on both sides of the street with a capacity for approximately 14 cars. Signs are posted "No Parking 6 AM – 8 AM Thursday" (west side), "No Parking 6 AM – 8 AM, Tuesday" (east side), "2 Hour Metered Parking 7 AM – 9 PM, Monday – Friday", "Tow-Away Zone, Any Vehicles Without Zone 7 Permit Parked in Zone Over 2 Hours". There are sidewalks on both sides of the street. The statutory speed limit is 25 miles per hour (MPH).

Marin Boulevard

Marin Boulevard is categorized as an urban minor arterial under the jurisdiction of the City of Jersey City. Marin Boulevard is oriented in a north-south direction, extending between Newark Avenue in the north and Liberty Harbor in the south. Near the proposed site, Marin Boulevard provides one travel lane southbound and two travel lanes northbound. Parking is not permitted on either side of the street. There are sidewalks on both sides of the street. The statutory speed limit is 25 MPH.

16th Street

16th Street is a local street under City jurisdiction. 16th Street is oriented in an east-west direction and extends between Marin Boulevard in the east and Coles Street in the west. Near Grove Street, 16th Street has one travel lane in each direction. There are sidewalks on both sides of the street. Parking is permitted on both sides of the street, except on the north side, west of the intersection. There are signs posted "No Parking Any Time" on the north side and "No Parking Unauthorized Vehicles Will Be Towed Away at Vehicle Owner's Expenses" on the north side. 16th Street has a statutory speed limit of 25 MPH.

15th Street

15th Street is a local street under City jurisdiction. 15th Street has one travel lane and is oriented in a westbound direction, extending between Marin Boulevard in the east and Erie Street in the west, then continuing as a two-way street between Jersey Avenue and Coles Street. There are sidewalks on both sides of the street. Parking is permitted on both sides of the street, except on the north side, west of the intersection. There are signs posted "No Parking 6 AM – 8 AM Thursday" (north side), "No Parking 6 AM – 8 AM, Tuesday" (south side), "2 Hour Parking 7 AM

– 9 PM, Monday – Friday", "Tow-Away Zone, Any Vehicles Without Zone 18 Permit Parked in Zone Over 2 Hours". 15th Street has a statutory speed limit of 25 MPH.

Studied Intersections
The intersections included in this traffic study are described as follows:

Grove Street with 16th Street
At this signalized intersection, the southbound, eastbound, and westbound approaches have one shared left-turn/through/right-turn lane. The intersection is controlled by a semi-actuated, two-phase, traffic signal with a 90-second background cycle. The intersection provides pedestrian indications, marked crosswalks, and ADA compliant curb ramps.

Marin Boulevard with 16th Street
At this STOP-controlled intersection, 16th Street is controlled by a STOP sign. The southbound and eastbound approaches each have one shared movement lane, while northbound has two lanes. The intersection provides crosswalks, pedestrian crossing signs, and ADA curb ramps.

Mass Transportation Options
The project site is 0.7 mile or a 14-minute walk from the Newport PATH station and 0.7 mile or a 14-minute walk from the Hoboken PATH station. In addition to public mass transportation, the project will include a shuttle bus service providing direct service to the PATH station. Therefore, it is anticipated that many of the AM and PM peak hour trips associated with the residential apartments would be pedestrian trips to and from the shuttle bus.

Bicycle Master Plan 2019
Near the subject site, as of 9/30/2019, the *Let's Ride JC Bicycle Master Plan* shows bicycle lanes on Grove Street, Marin Boulevard, and 16th Street. There is a Citi Bike coral at the Newport PATH station and a Citi Bike coral on Newport Parkway at River Drive South.

Pedestrian Enhancement Plan 2018
Near the subject site, Grove Street and Marin Boulevard were identified by the public as key streets that need improvement for walkability. Between the years 2014 and 2016, there were crashes involving pedestrians at the intersection of 15th Street with Grove Street and crashes involving bicycles at the intersection of 18th Street with Marin Boulevard.

School Travel Plan 2019
Near the subject site, as of July 2019, the Jersey City School Travel Plan shows there are no crossing guards at the intersections near the subject property.

Crashes (2012-2016)
Between the years 2012 and 2016, the *School Travel Plan* identified crashes involving bicyclists at the intersection of 18th Street with Marin Boulevard, and crashes involving pedestrians at 15th Street with Grove Street.

Vision Zero Action Plan
Near the subject property, Bergen Avenue, Montgomery Street, and Kennedy Boulevard are included in the "City Streets" and "All Roads High Injury Network." There was a moderate bicycle or pedestrian crash at the intersections of 15th Street with Grove Street and 18th Street with Marin Boulevard.

Existing Traffic Volumes
The AM and PM peak period traffic volumes were collected at the intersections of Grove Street with 16th Street and 16th Street with Marin Boulevard. These counts were conducted at the intersections on Tuesday, September 13 during the AM peak period (7:00 AM to 9:00 AM) and during the PM peak period (4:00 PM to 6:00 PM). The peak hours of traffic were determined to be approximately 7:45 AM to 8:45 AM and 4:45 PM to 5:45 PM. The AM and PM peak hour traffic volumes along eastbound and westbound Sixteenth Street were balanced between the two intersections. These AM and PM peak hour traffic volumes are illustrated in Figures 2-A and 2-B, 2022 Existing AM and PM Peak Hour Traffic Volumes. A summary of the intersection count data is provided in Appendix I Traffic Volumes.

CAPACITY ANALYSES METHODOLOGY
The AM and PM peak hour volumes for year 2022 existing traffic conditions were utilized to perform the intersection capacity analyses at the studied intersections. The methodology found in Chapter 18, Signalized Intersections, and Chapter 19, Two-Way Stop-Controlled Intersections of the 2010 Highway Capacity Manual published by the Transportation Research Board was used in calculating the capacity of the intersections and yielding a level of service for the impeded traffic movements. Definitions of signalized and unsignalized levels of service are provided in Appendix II Level of Service Definitions.

Existing Intersection Capacity Analyses
The results of the intersection capacity analyses for the weekday AM and PM peak hours are summarized in Table 1 Level of Service/Average Vehicle Delay Comparison – Existing Versus No Build Versus Build Conditions. The existing peak hour traffic conditions presented in the first set of columns illustrate current operating conditions of each lane group at the studied intersections operate at acceptable Levels of Service (LOS) D or better. The one-page capacity analysis summary printouts are provided in Appendix III Capacity Analyses.

Year 2027 No-Build Conditions

The build out year of the proposed development has been established as the year 2027. This future build-out year of 2027 is used to assess future conditions without and with the proposed development. Background growth rates, taken from the NJDOT Annual Growth Rate Table, were used to determine future traffic volumes that would be expected in 2027. We have used the published NJDOT growth rates to account for potential growth within the study period. An annual growth rate of 1.0 percent per year was used for an urban principal arterial roadway in Hudson County. The 2027 No-Build Peak Hour Traffic Volumes are illustrated in Figures 3-A and 3-B, 2027 No-Build AM and PM Peak Hour Traffic Volumes.

We referred to the City's "Downtown Development Maps 1.30.19" to determine the size and status of each of the other developments within the study area. These developments included Holiday Inn on Fourteenth Street, Jersey Avenue Park, St. Lucy's, and the 580 Marin Boulevard. We added a portion of the site-generated trips from those other developments to the No-Build traffic volumes at the studied intersections.

Capacity analyses were performed at the studied intersections for the 2027 No-Build condition based upon the volumes shown in Figure 3. The resulting level of service analyses for the 2026 No-Build AM and PM peak hours are unchanged with average delay increases of less than 2 seconds, which indicates a negligible change that would be imperceptible to the motorist. These changes in average vehicle delay are a result of the background growth traffic. Table 1 summarizes and shows a side-by-side comparison of the levels of service and average vehicle delay of the 2022 Existing and the 2027 No Build studied intersection analyses.

PROPOSED DEVELOPMENT

The proposed development consists of the construction of 613 units of multifamily housing (high-rise) and 5,100 square feet of retail space. Access to the proposed development will be provided by one, full-movement driveway on the south side of 16th Street. The project proposes a shuttle bus service to provide direct connection to the PATH station. The shuttle bus will transport passengers during peak commuting hours, Monday through Friday.

Trip Generation

According to the *Trip Generation, 11th Edition,* published by the Institute of Transportation Engineers, Multifamily Housing (High-Rise) "High-rise multifamily housing includes apartments, townhouses, and condominiums. Each building has more than 10 floors of living space. Access to individual dwelling units is through an outside building entrance, a lobby, elevators, and a set of hallways." Therefore, the trip generation for the proposed residential portion of the project was calculated using the current *Trip Generation, 11th Edition* for the land use Multifamily Housing (High-Rise) in a dense multi-use urban setting. The trip generation average rates for "Dense Multi-Use Urban" would account for the mass transportation "discount" that would be applied to the vehicular trip generation calculation to account for the significant usage of mass transportation and the proposed shuttle bus service. However, to be conservative, the trip generation for the residential portion of the project was calculated using the Average Rates and the Lane Use Subcategory "Not Close to Rail Transit."

Based on the size of the retail space, the percentage of trips associated with the retail space would be primarily pass-by trips, which is reflected in the PM peak hour pass-by rate of 92 percent, which was calculated based on ITE standards and is also shown in Table 2. Pass-by trips are trips that are already on the roadway network and are not new trips to the studied intersections. The 5,100 square feet of retail space would generate 12 new vehicle trips during the weekday AM peak hour and would generate 3 new vehicle trips (34 total vehicle trips) during the PM peak hour. Due to the high pedestrian activity in the area, most of those new trips to and from the retail space would be pedestrian traffic. However, to be conservative, we have assumed these new trips to be vehicular trips.

Table 2 Trip Generation Summary tabulates the trip generation for the proposed 613 units of Multifamily Housing (High-Rise) and the proposed 5,100 square feet of retail space.

Year 2027 Build Conditions

As shown in Table 2 Trip Generation Summary, the proposed 613 units of multifamily housing (high-rise) and the proposed 5,100 square feet of retail space would generate 67 new vehicle trips entering and 92 new vehicle trips exiting the site during the AM peak hour and 63 new vehicle trips entering and 63 new vehicle trips exiting the site during the PM peak hour. The trip distribution is illustrated in Figures 4-A and 4-B, Peak Hour Trip Distribution Percentages for the AM peak hour and the PM peak hour, respectively.

The site-generated traffic summarized in Table 2 was distributed to each of the studied intersections based on the distribution percentages shown in Figures 4-A AM Peak Hour Trip Distribution Percentages and Figure 4-B PM Peak Hour Trip Distribution Percentages and in Figures 5-A and 5-B, AM and PM Peak Hour Site Generated Vehicle Trips. The site generated traffic volumes presented in Figure 5 were added to the 2027 No-Build traffic volumes in Figure 3 to yield the traffic volumes illustrated in Figures 6-A and 6-B, 2027 Build Peak Hour Traffic Volumes for the AM and PM peak hours, respectively.

As shown in Table 1 Level of Service/Average Vehicle Delay – Existing Versus No Build Versus Build Conditions, there are no changes in the levels of service between the Year 2027 No Build condition and the Year 2027 Build condition for the studied intersections. The increase in average delay is less than 2 seconds and results in no changes to the level of service. No modifications to the studied intersections or the traffic control devices would be required.

Again, it should be noted that the trip generation calculation would be considered conservative using the Average Rates for Multifamily Housing (High-Rise) without any factor to "discount" the vehicles trips to account for non-vehicular trips due to walking, bicycling, mass transportation, or shuttle bus service.

During both the AM and PM peak hours, the traffic entering the site driveway from 16th Street would be two to three vehicles every minute, which would not have a negative impact on traffic operations along 16th Street. The vehicle queue exiting the site driveway would be approximately one vehicle during the AM peak hour and approximately one vehicle during the PM peak hour, which would not impact traffic operations on the public streets.

Per the Zoning Ordinance, a loading dock is required. There are two loading docks proposed, one on the 16th Street side and one on the 15th Street side of the property. The proposed on-site loading docks would also be available for move-in/move-out of the residential and retail tenants. However, trucks will be required to reverse into the loading dock, rather than "head-in" to the loading dock. Then trucks exiting the loading dock would be "head-out." Trash and recycling pick-up would take place in the loading docks. Typical deliveries such as UPS, FedEx, and Amazon for residents and retail would occur along 16th Street. The proposed on-site loading docks accommodate truck activities with a longer duration. A traffic director would be provided to stop traffic and pedestrian movements along 15th Street and 16th Street during the

entering reverse maneuver as well as the exiting maneuver at the loading docks. Other visual and audible devices could be installed to warn pedestrians of trucks exiting the loading docks. 16th Street is two-way with a two-way traffic volume of less than 150 vehicles per hour during the weekday AM peak hour and less than 200 vehicles per hour during the PM peak hour. Pedestrian activity across the front of the loading dock would not be as busy as other portions of 16th Street closer to Marin Boulevard. 15th Street is a one-way street and was not studied as part of this project.

SITE PLAN REVIEW

The surface parking layout is proposed with properly designed parking stalls and drive aisles. There are 12 surface parking spaces proposed within the site with the required number of ADA parking spaces and ADA van accessible parking spaces. The ADA parking spaces are designed to be accessible. The walking routes between those ADA compliant parking spaces and the elevators are adequate. The remaining 188 parking spaces are proposed within a mechanical parking system. The proposed site will provide a total of 200 parking spaces, or 0.25 parking spaces per bedroom. The Jersey Avenue Light Rail Redevelopment Plan identifies a maximum parking ratio of 0.5 parking spaces per bedroom. Therefore, the maximum parking requirement is not exceeded.

The 5,100 square feet of retail space requires 0.5 parking spaces per 1,000 square feet of retail space, or 3 parking spaces. Since much of the traffic generated by the proposed retail portion of the site would be pass-by traffic and local pedestrian traffic, there is not an expectation of a high parking demand for the proposed retail space. It is anticipated that a large amount of the potential residents of this proposed residential portion of the redevelopment would not own a second vehicle or would not own a vehicle at all and would take advantage of the close and frequent public transportation services and the surrounding commercial area.

The site is proposed with one, full-movement driveway on 16th Street, approximately 250 feet from Marin Boulevard and approximately 250 feet from Grove Street. The driveway is designed to accommodate ease of maneuvering for appropriate vehicle types. Adequate pedestrian access is provided between the building elevators and the parking area. A STOP sign and stop line is provided at the exit driveway.

Adequate sight distances are provided from the proposed driveway looking east and west on 16th Street. The design speed of 16th Street is 30 miles per hour thus resulting in a recommended stopping sight distance of 200 feet, in accordance with A Policy on Geometric Design of Highways and Streets (AASHTO).

CONCLUSIONS

Based upon our data collection effort, analysis, and evaluation, it is our professional opinion that the vehicular traffic generated by the proposed 613 units of multifamily housing (high-rise) and 5,100 square feet of retail space would have a negligible impact on traffic conditions during the AM and PM peak commuter traffic hours. The studied intersections are expected to continue to operate at acceptable Levels of Service C or better during both the weekday AM and PM peak hours. Any increase in average vehicle delay would be small and would be imperceptible to the motoring public. No mitigation measures are required at either of the studied intersections.

The proposed parking supply of 200 parking spaces does not exceed the maximum parking requirement of 396 parking spaces. The retail portion of the development requires only 3 parking spaces and is not expected to generate a significant amount of vehicular traffic or require parking.

The proposed design of the site would more than adequately serve the needs of the project's residents. The site plan is designed with adequate parking and circulation for the residents and services associated with the project. Access to the parking garage via one, two-way driveway is adequate to serve the proposed traffic demand. Conveniently proposed private shuttle bus service to local mass transportation, it is anticipated that many of the trips generated by the proposed apartments would be via the shuttle bus to use mass transportation.

In conclusion, the development of this project advances the goals of the Jersey Avenue Light Rail Redevelopment Plan and will have no significant impact on the traffic operations of the area roadways and intersections.

APPENDIX I

TRAFFIC VOLUMES

AM AND PM PEAK PERIOD INTERSECTION TURNING MOVEMENT COUNTS
619 Marin Boulevard, Jersey City, Hudson County, NJ

	16th Street EB		Marin Blvd NB		Marin Blvd SB		Tuesday, September 13, 2022		
	1	3	7	8	11	12	TOTAL		
End	L	R	L	T	T	R			
7:15	21	25	4	17	110	12	189		
7:30	10	10	2	38	71	2	133		
7:45	8	8	1	56	98	3	174		
8:00	9	14	2	72	88	2	187	683	
8:15	13	12	1	79	74	5	184	678	
8:30	8	8	2	99	76	1	194	739	
8:45	20	13	3	99	53	2	190	**755**	**7:45-8:45**
9:00	18	8	1	82	63	1	173	741	
9:15	4	12	4	5	76	6	107	664	
9:30	6	12	6	5	71	6	106	674	
Peak Hr	**50**	**47**	**8**	**349**	**291**	**10**	**755**		
							0.97	**PHF**	

	16th Street EB		Marin Blvd NB		Marin Blvd SB		Tuesday, September 13, 2022		
	1	3	7	8	11	12	TOTAL		
End	L	R	L	T	T	R			
4:15	16	9	10	126	78	11	250		
4:30	9	7	7	91	58	6	178		
4:45	23	15	7	122	92	6	265		
5:00	14	15	9	92	72	10	212	905	
5:15	12	12	10	98	49	7	188	843	
5:30	19	16	7	75	47	3	167	832	
5:45	29	6	8	102	80	10	235	**802**	**4:45-5:45**
6:00	27	15	11	77	55	8	193	783	
6:15	10	18	4	12	80	19	143	738	
6:30	11	19	6	12	81	20	149	739	
Peak Hr	**74**	**49**	**34**	**367**	**248**	**30**	**802**		
							0.85	**PHF**	

	16th Street EB			16th Street WB			Grove Street SB			Tuesday, September 13, 2022		
	1	2	3	4	5	6	9	11	12	TOTAL		
End	L	T	R	L	T	R	L	T	R			
7:15										0		
7:30	9	14	36	1	0	2	1	45	0	108		
7:45	8	12	51	3	1	0	2	80	4	161		
8:00	5	22	58	8	4	0	1	88	0	186	455	
8:15	11	21	32	1	0	0	3	80	3	151	606	
8:30	8	11	32	2	3	2	2	72	1	133	631	
8:45	9	28	21	1	2	3	6	78	2	150	**620**	**7:45-8:45**
9:00	9	22	21	0	2	3	4	76	1	138	572	
9:15	10	28	18	2	1	2	2	76	6	145	566	
9:30	11	30	19	3	1	1	1	71	6	143	576	
Peak Hr	**33**	**82**	**143**	**12**	**9**	**5**	**12**	**318**	**6**	**620**		
										0.83	**PHF**	

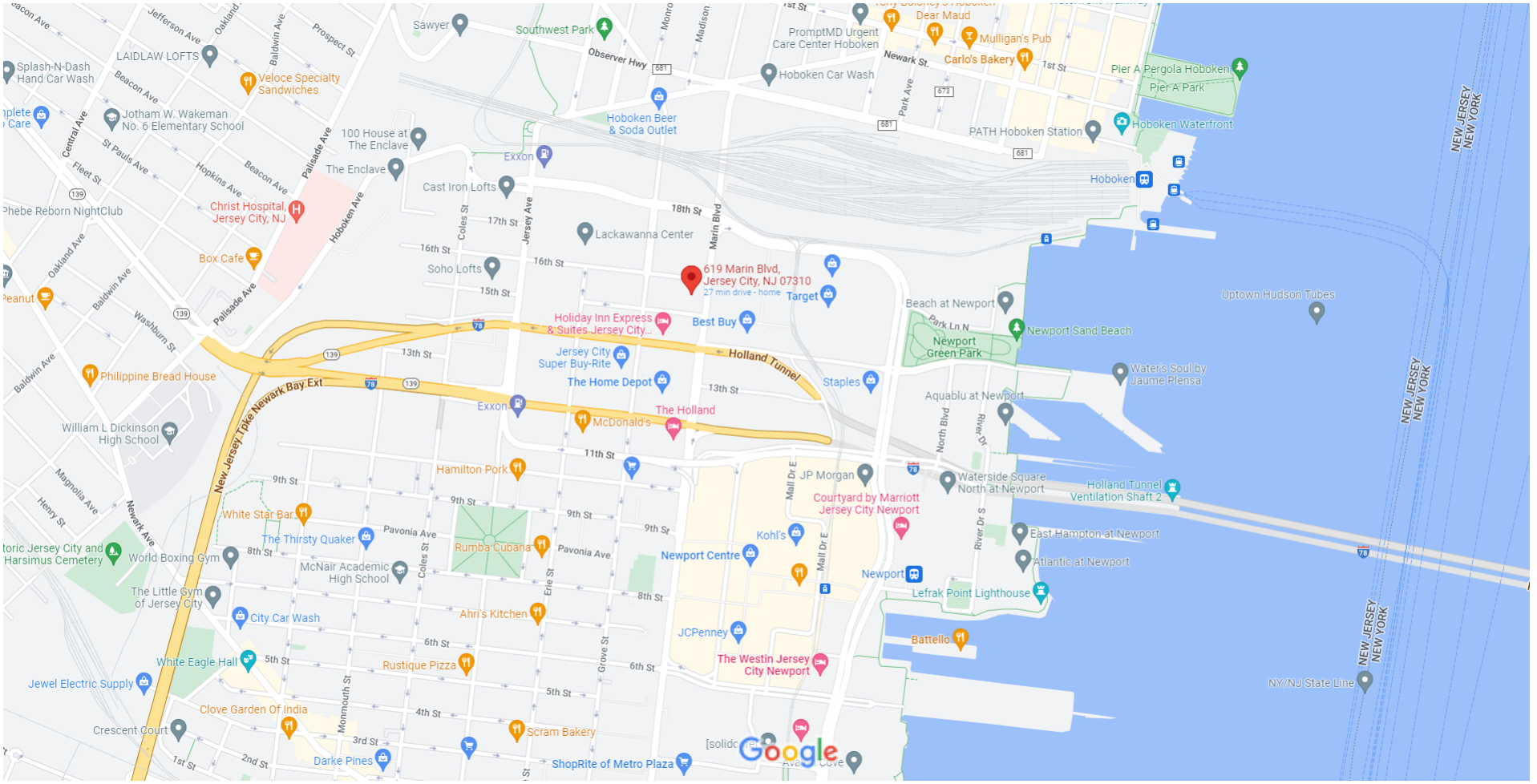
	16th Street EB			16th Street WB			Grove Street SB			Tuesday, September 13, 2022		
	1	2	3	4	5	6	9	11	12	TOTAL		
End	L	T	R	L	T	R	L	T	R			
4:15										0		
4:30	18	23	24	5	4	2	3	83	4	166		
4:45	18	31	26	0	3	1	2	70	7	158		
5:00	20	35	14	9	7	7	2	101	2	197	521	
5:15	25	23	13	5	4	0	1	70	4	145	666	
5:30	30	31	21	3	3	0	5	103	4	200	700	
5:45	13	25	18	8	7	1	4	96	6	178	**720**	**4:45-5:45**
6:00	12	20	18	7	7	7	1	70	5	147	670	
6:15	10	28	18	2	1	2	2	76	6	145	670	
6:30	11	30	19	3	1	1	1	71	6	143	613	
Peak Hr	**88**	**114**	**66**	**25**	**21**	**8**	**12**	**370**	**16**	**720**		
										0.90	**PHF**	

FIGURES AND TABLES

Google Maps

619 Marin Blvd

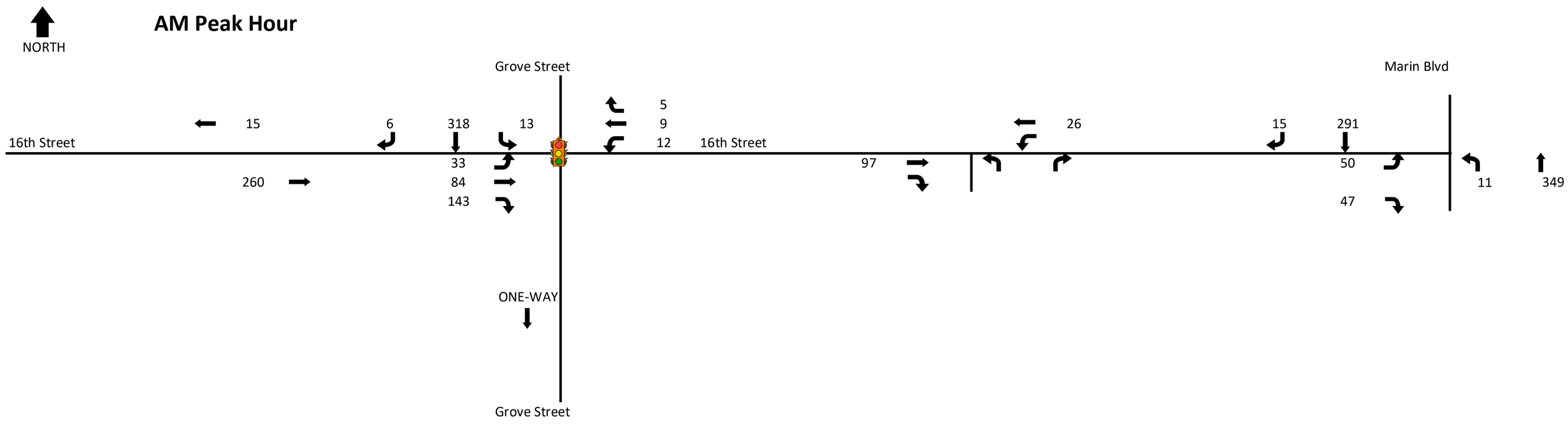
FIGURE 1 - LOCATION MAP



Map data ©2022 500 ft

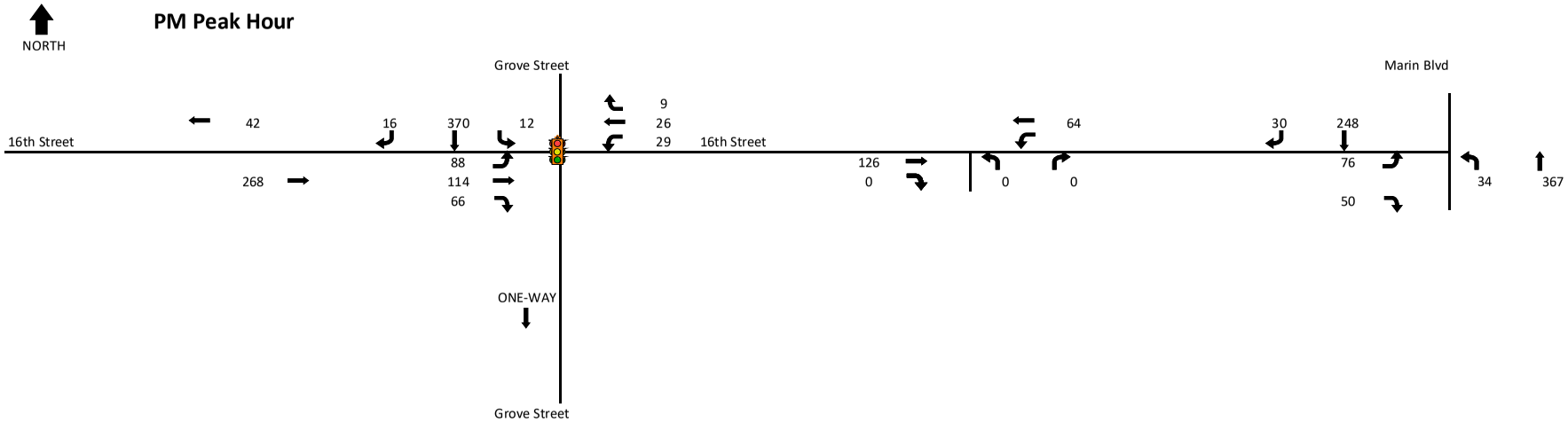
619 Marin Boulevard, Jersey City, Hudson County, NJ

Figure 2-A 2022 Existing AM Peak Hour Traffic Volumes



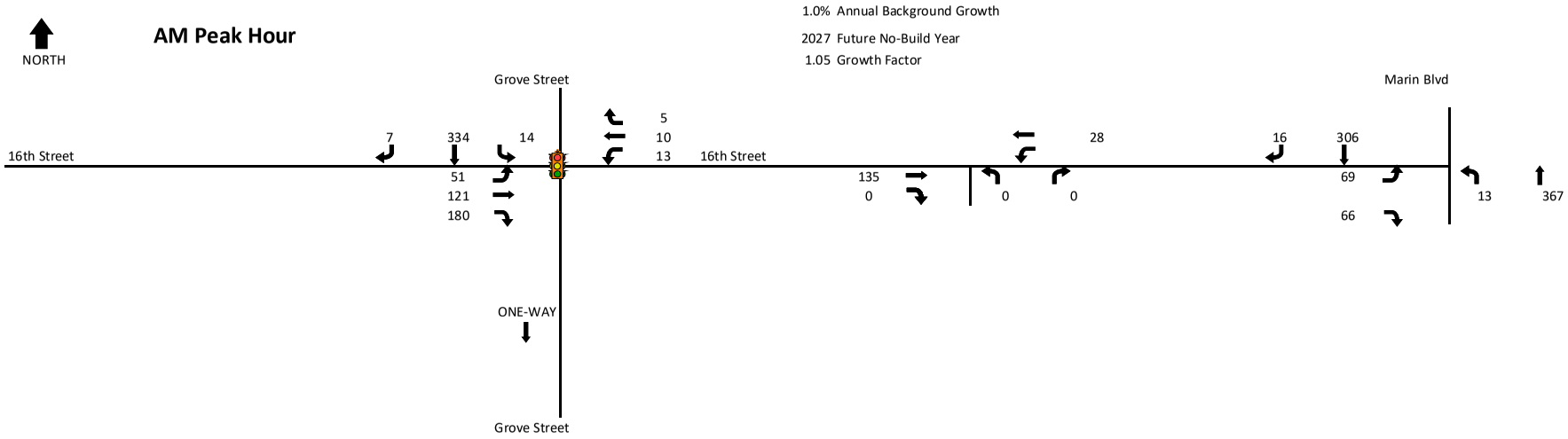
619 Marin Boulevard, Jersey City, Hudson County, NJ

Figure 2-B 2022 Existing PM Peak Hour Traffic Volumes



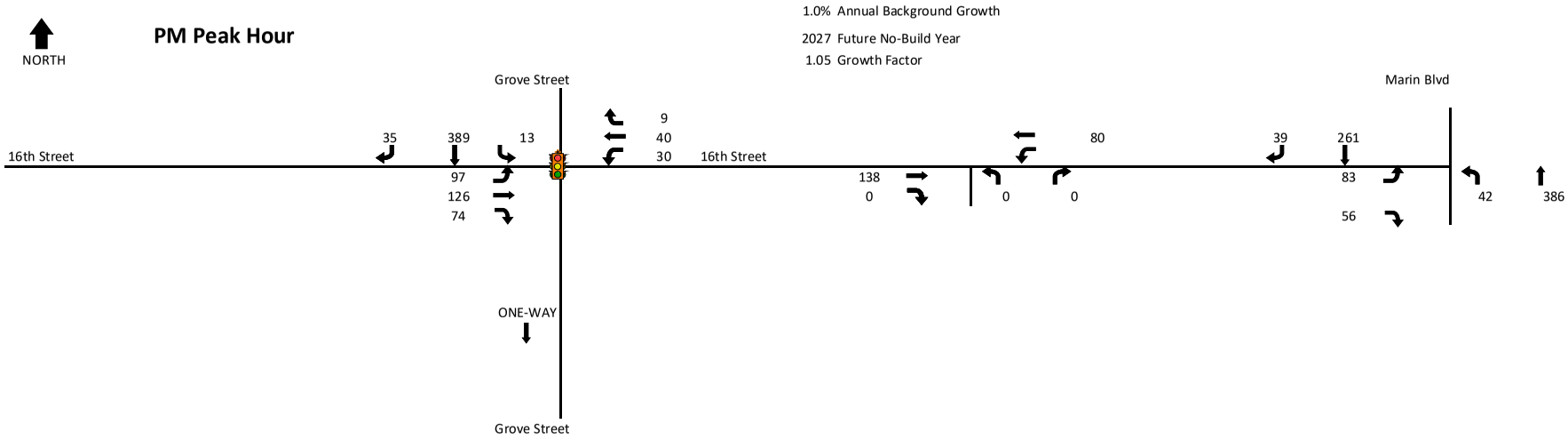
619 Marin Boulevard, Jersey City, Hudson County, NJ

Figure 3-A 2027 No-Build AM Peak Hour Traffic Volumes



619 Marin Boulevard, Jersey City, Hudson County, NJ

Figure 3-B 2027 No-Build PM Peak Hour Traffic Volumes



619 Marin Boulevard, Jersey City, Hudson County, NJ

Table 2 Trip Generation Summary

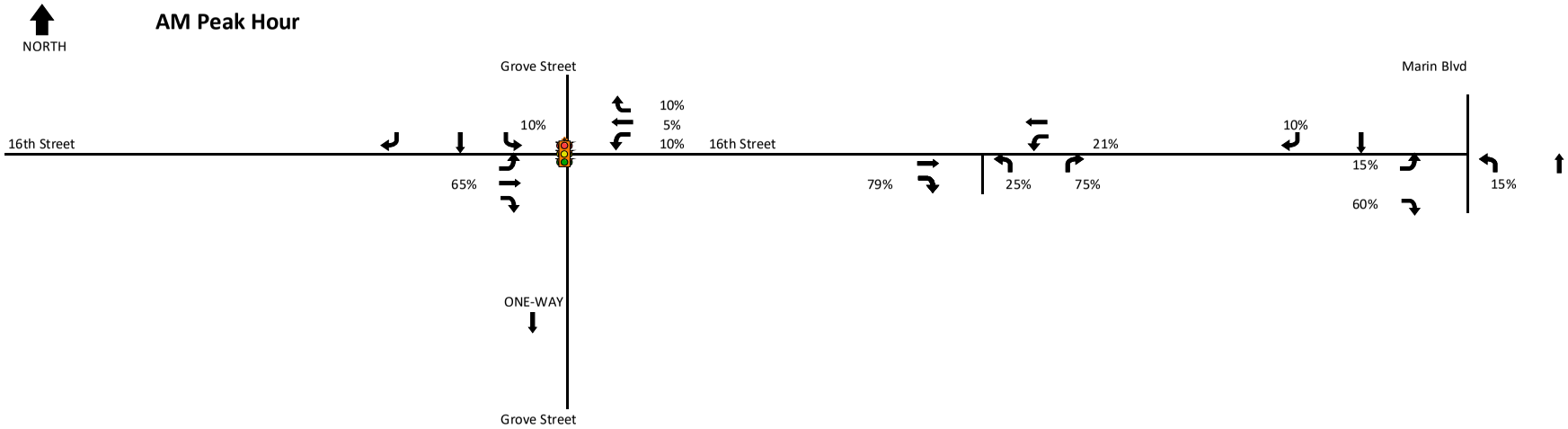
			WEEKDAY					
			AM PEAK HOUR			PM PEAK HOUR		
CODE	LAND USE	AMOUNT	IN	OUT	TOTAL	IN	OUT	TOTAL
VEHICLE TRIPS								
222	Multifamily Housing (High-Rise) Dense Multi-Use Urban	613 units	60	87	147	61	62	123
822	Strip Retail Plaza (<40KSF)	5,100 SF	7	5	12	17	17	34
	Pass By Percentage (PM)	-92%				(16)	(16)	(31)
	NEW TRIPS (Subtotals)		*7*	*5*	*12*	*2*	*1*	*3*
	TOTAL SITE-GENERATED NEW VEHICLE TRIPS		**67**	**92**	**159**	**63**	**63**	**126**
WALK+BIKE+TRANSIT TRIPS								
223	Multifamily Housing (High-Rise) Dense Multi-Use Urban	613 units	94	115	209	72	88	160

SOURCES: *Trip Generation, 11th Edition* , published by the Institute of Transportation Engineers (ITE)

NOTE: Project is within a 14-minute/0.7 mile walk of the Newport PATH and the Hoboken PATH stations

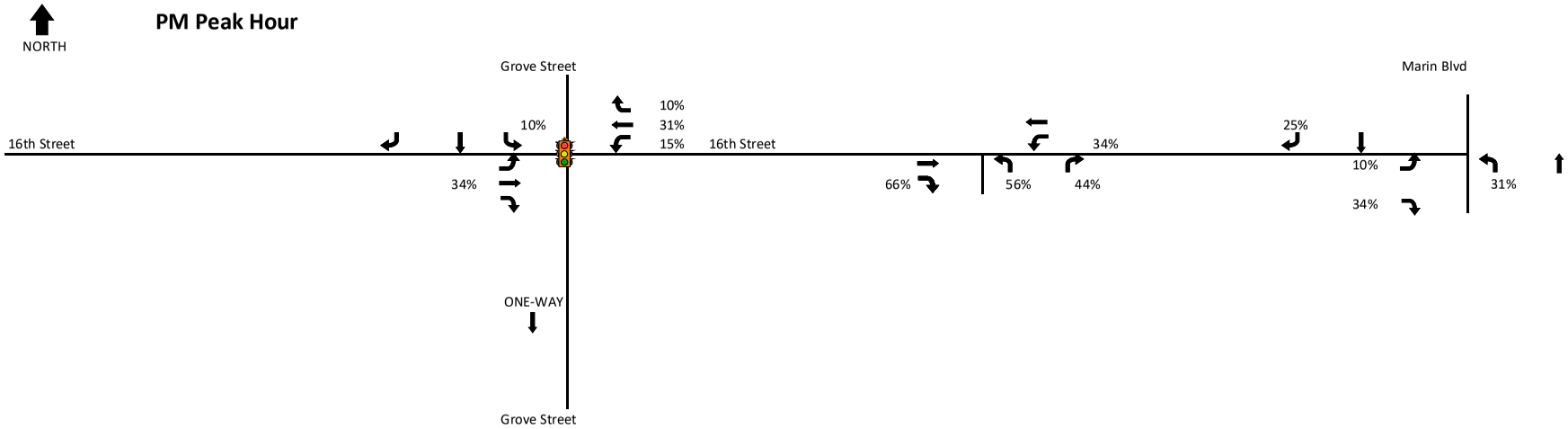
619 Marin Boulevard, Jersey City, Hudson County, NJ

Figure 4-A AM Peak Hour Trip Distribution



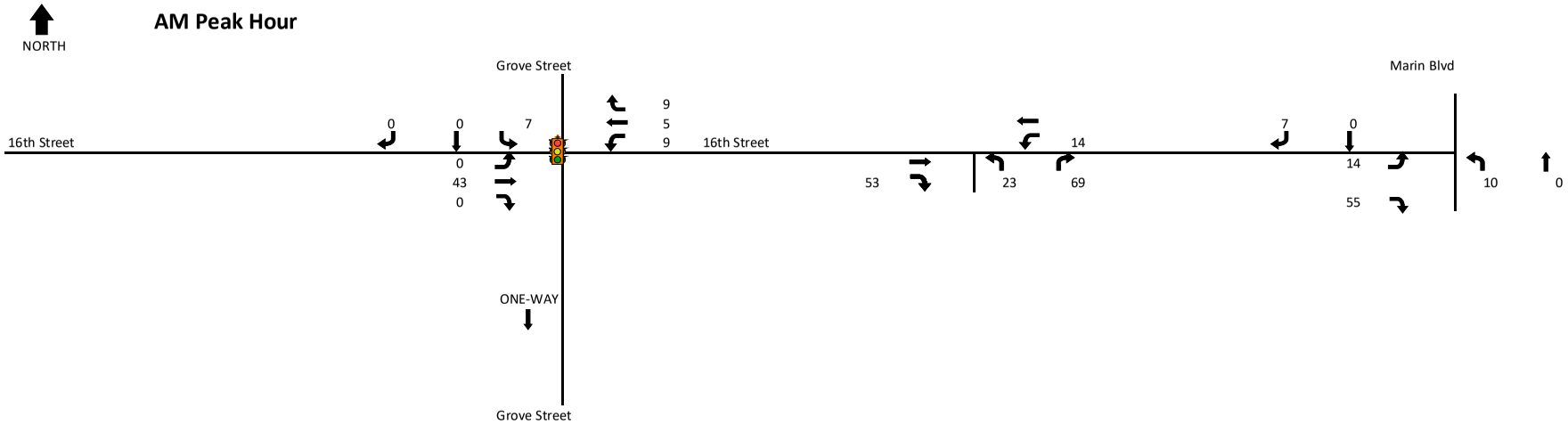
619 Marin Boulevard, Jersey City, Hudson County, NJ

Figure 4-B PM Peak Hour Trip Distribution



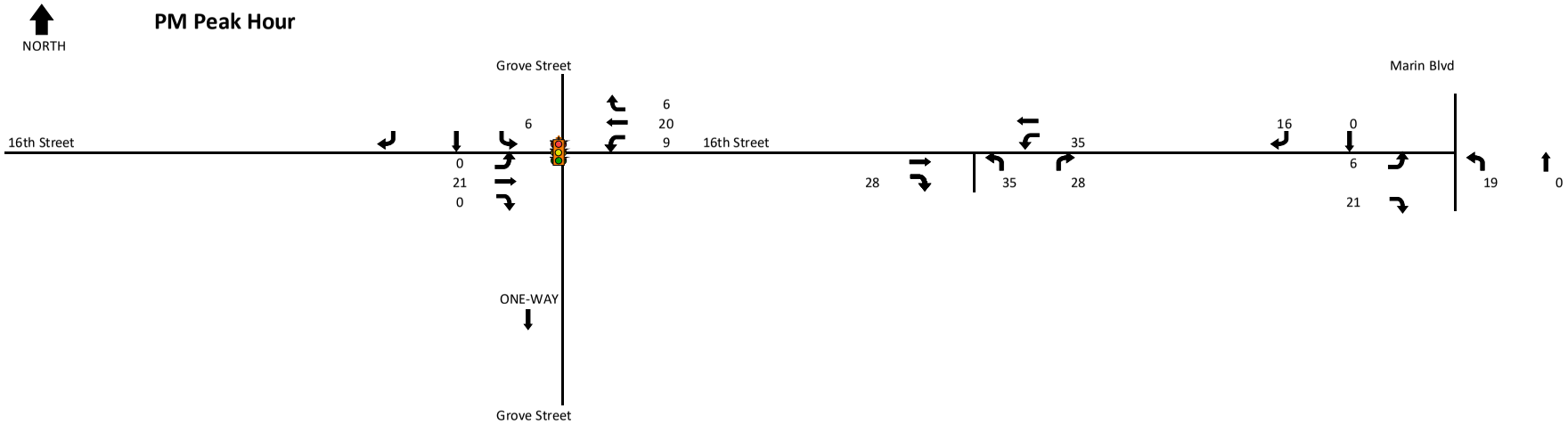
619 Marin Boulevard, Jersey City, Hudson County, NJ

Figure 5-A AM Peak Hour Site Generated Trips



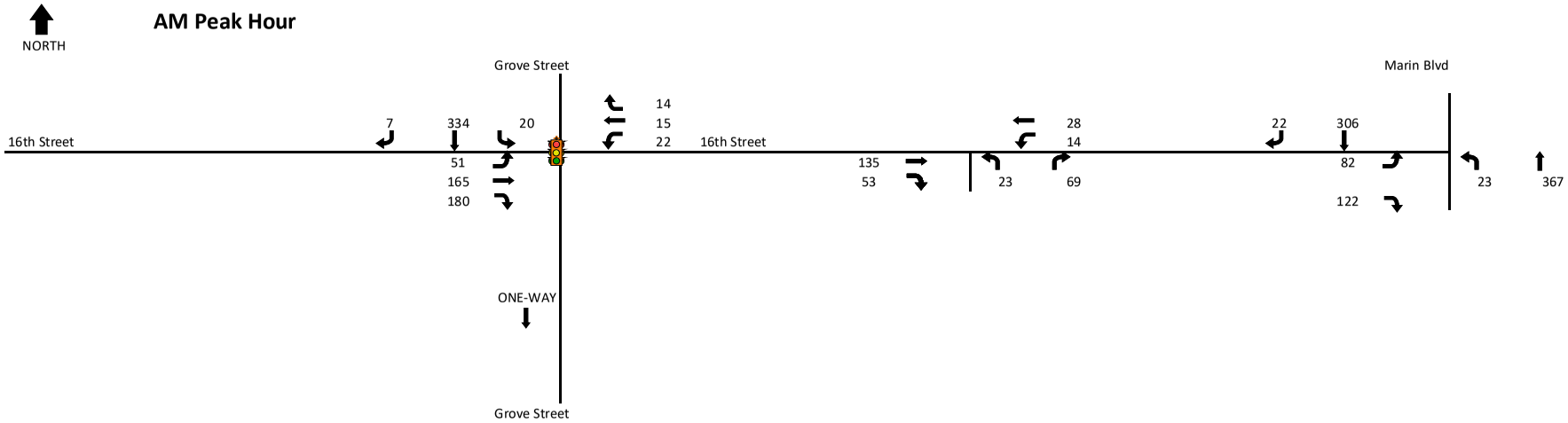
619 Marin Boulevard, Jersey City, Hudson County, NJ

Figure 5-B PM Peak Hour Site Generated Trips



619 Marin Boulevard, Jersey City, Hudson County, NJ

Figure 6-A 2027 Build AM Peak Hour Traffic Volumes



619 Marin Boulevard, Jersey City, Hudson County, NJ

Figure 6-B 2027 Build PM Peak Hour Traffic Volumes

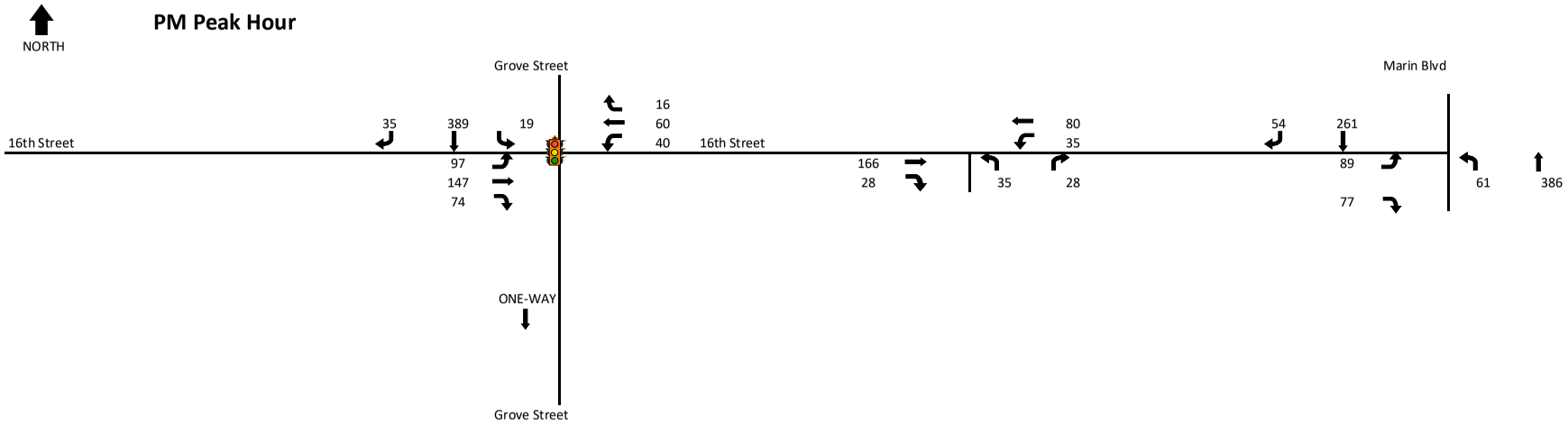


TABLE 1 - LEVEL OF SERVICE / AVERAGE VEHICLE DELAY COMPARISON - EXISTING VS NO-BUILD VS BUILD CONDITIONS
619 Marin Boulevard, Jersey City, Hudson County, NJ

	2022 Existing Condition							2027 No-Build Condition							2027 Build Condition						
		AM PEAK			PM PEAK				AM PEAK			PM PEAK				AM PEAK			PM PEAK		
Intersection	LANE GROUP	V/C Ratio	Delay (sec)	Levels of Service	V/C Ratio	Delay (sec)	Levels of Service	LANE GROUP	V/C Ratio	Delay (sec)	Levels of Service	V/C Ratio	Delay (sec)	Levels of Service	LANE GROUP	V/C Ratio	Delay (sec)	Levels of Service	V/C Ratio	Delay (sec)	Levels of Service
16th Street	**EB-LTR**	0.29	7.9	A	0.29	8.6	A	**EB-LTR**	0.41	9.5	A	0.34	10.2	B	**EB-LTR**	0.45	10.3	B	0.36	10.7	B
&	**WB-LTR**	0.03	6.0	A	0.08	7	A	**WB-LTR**	0.04	6.4	A	0.09	8.1	A	**WB-LTR**	0.07	6.8	A	0.14	8.5	A
Grove Street	**SB-LTR**	0.90	35.5	D	0.91	34.6	C	**SB-LTR**	0.91	35.0	C	0.92	33.4	C	**SB-LTR**	0.91	34.8	C	0.92	33.2	C
(Signalized)	**Intersection**		22.8	C		22.6	C	**Intersection**		21.7	C		22.5	C	**Intersection**		21.0	C		21.8	C
16th Street	**EB-LR**	0.17	12.4	B	0.30	15.2	C	**EB-LR**	0.25	13.4	B	0.35	16.7	C	**EB-LR**	0.37	14.8	B	0.43	18.9	C
&																					
Marin Boulevard	**NB-LT**	0.01	7.9	A	0.03	8.0	A	**NB-LT**	0.01	8.0	A	0.04	8.1	A	**NB-LT**	0.02	8.0	A	0.06	8.2	A
(Unsignalized)	**Approach**		0.3	A		0.9	A	**Approach**		0.4	A		1.1	A	**Approach**		0.6	A		1.5	A
16th Street																					
&															**NB-LR**	0.14	10.1	B	0.10	10.7	B
Site Driveway															**WB-LT**	0.01	7.7	A	0.03	7.7	A
(Unsignalized)															**Approach**		2.5	A		2.5	A

APPENDIX II

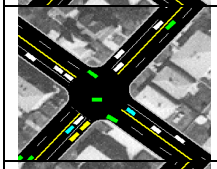
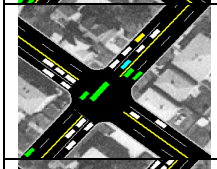
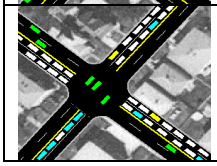
LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE / AVERAGE DELAY CRITERIA *

Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operating conditions, was performed using the 2010 Highway Capacity Manual (HCM) and 2010 Highway Capacity Software.

For a signalized intersection, Level of Service (LOS) A indicates operations with delay less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 80 seconds per vehicle.

For an unsignalized intersection, LOS A indicates operations with delay less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 50 seconds per vehicle.

	Level Of Service (LOS)	Signalized Delay Range (average delay, sec/veh)	Unsignalized Delay Range (average delay in sec/veh)
	A	<=10	<=10
	B	>10 and <=20	>10 and <=15
	C	>20 and <=35	>15 and <=25
	D	>35 and <=55	>25 and <=35
	E	>55 and <=80	>35 and <=50
	F	>80	>50

* *Sources: Highway Capacity Manual (2010 Edition)*

APPENDIX III

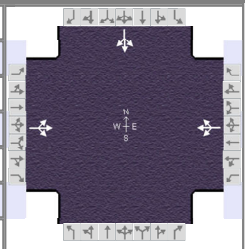
HIGHWAY CAPACITY SOFTWARE (HCS) PRINTOUTS

EXISTING CONDITIONS

HCS PRINTOUTS

HCS Signalized Intersection Results Summary

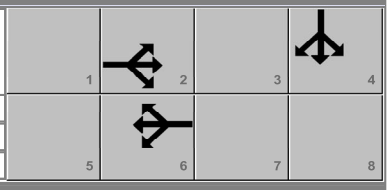
General Information				Intersection Information	
Agency	KLEIN TRAFFIC			Duration, h	0.250
Analyst	LDK	Analysis Date	Sep 14, 2022	Area Type	Other
Jurisdiction	JERSEY CITY	Time Period	AM PEAK HOUR	PHF	0.83
Urban Street	16TH ST	Analysis Year	2022 EXISTING	Analysis Period	1> 7:00
Intersection	GROVE/16TH	File Name	EX-AM-16-GR.xus		
Project Description	2022 EXISTING				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	33	84	143	12	9	5				13	318	6

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	57.6	22.4	0.0	0.0	0.0	0.0	
Yellow	3.0	3.0	0.0	0.0	0.0	0.0	
Red	2.0	2.0	0.0	0.0	0.0	0.0	



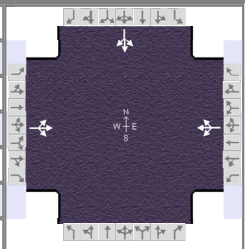
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6				4
Case Number		8.0		8.0				12.0
Phase Duration, s		62.6		62.6				27.4
Change Period, (*Y+R c*), s		5.0		5.0				5.0
Max Allow Headway (*MAH*), s		0.0		0.0				3.2
Queue Clearance Time (*g s*), s								21.5
Green Extension Time (*g e*), s		0.0		0.0				0.8
Phase Call Probability								1.00
Max Out Probability								0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16				7	4	14
Adjusted Flow Rate (*v*), veh/h		313			31						406	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1593			1370						1812	
Queue Service Time (*g s*), s		0.0			0.0						19.5	
Cycle Queue Clearance Time (*g c*), s		7.6			0.6						19.5	
Green Ratio (*g/C*)		0.64			0.64						0.25	
Capacity (*c*), veh/h		1065			936						450	
Volume-to-Capacity Ratio (*X*)		0.294			0.033						0.902	
Back of Queue (*Q*), ft/ln (50 th percentile)												
Back of Queue (*Q*), veh/ln (50 th percentile)		2.7			0.2						8.8	
Queue Storage Ratio (*RQ*) (50 th percentile)		0.00			0.00						0.00	
Uniform Delay (*d 1*), s/veh		7.2			5.9						32.8	
Incremental Delay (*d 2*), s/veh		0.7			0.1						2.8	
Initial Queue Delay (*d 3*), s/veh		0.0			0.0						0.0	
Control Delay (*d*), s/veh		7.9			6.0						35.5	
Level of Service (LOS)		A			A						D	
Approach Delay, s/veh / LOS	7.9	A		6.0	A		0.0			35.5	D	
Intersection Delay, s/veh / LOS	22.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.35	A	1.35	A	1.72	B	1.72	B
Bicycle LOS Score / LOS	1.00	A	0.54	A			1.16	A

HCS Signalized Intersection Results Summary

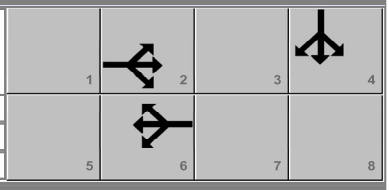
General Information				Intersection Information	
Agency	KLEIN TRAFFIC			Duration, h	0.250
Analyst	LDK	Analysis Date	Sep 14, 2022	Area Type	Other
Jurisdiction	JERSEY CITY	Time Period	PM PEAK HOUR	PHF	0.90
Urban Street	16TH ST	Analysis Year	2022 EXISTING	Analysis Period	1> 7:00
Intersection	GROVE/16TH	File Name	EX-PM-16-GR.xus		
Project Description	2022 EXISTING				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	88	114	66	29	26	9				12	370	16

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	55.7	24.3	0.0	0.0	0.0	0.0	
Yellow	3.0	3.0	0.0	0.0	0.0	0.0	
Red	2.0	2.0	0.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6				4
Case Number		8.0		8.0				12.0
Phase Duration, s		60.7		60.7				29.3
Change Period, (*Y+R c*), s		5.0		5.0				5.0
Max Allow Headway (*MAH*), s		0.0		0.0				3.2
Queue Clearance Time (*g s*), s								23.4
Green Extension Time (*g e*), s		0.0		0.0				0.9
Phase Call Probability								1.00
Max Out Probability								0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16				7	4	14
Adjusted Flow Rate (*v*), veh/h		298			71						442	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1578			1437						1803	
Queue Service Time (*g s*), s		3.3			0.0						21.4	
Cycle Queue Clearance Time (*g c*), s		7.4			1.4						21.4	
Green Ratio (*g/C*)		0.62			0.62						0.27	
Capacity (*c*), veh/h		1030			948						486	
Volume-to-Capacity Ratio (*X*)		0.289			0.075						0.909	
Back of Queue (*Q*), ft/ln (50 th percentile)												
Back of Queue (*Q*), veh/ln (50 th percentile)		2.7			0.5						9.5	
Queue Storage Ratio (*RQ*) (50 th percentile)		0.00			0.00						0.00	
Uniform Delay (*d 1*), s/veh		7.9			6.8						31.8	
Incremental Delay (*d 2*), s/veh		0.7			0.2						2.8	
Initial Queue Delay (*d 3*), s/veh		0.0			0.0						0.0	
Control Delay (*d*), s/veh		8.6			7.0						34.6	
Level of Service (LOS)		A			A						C	
Approach Delay, s/veh / LOS	8.6	A		7.0	A		0.0			34.6	C	
Intersection Delay, s/veh / LOS	22.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.36	A	1.36	A	1.72	B	1.72	B
Bicycle LOS Score / LOS	0.98	A	0.60	A			1.22	A

HCS Two-Way Stop-Control Report

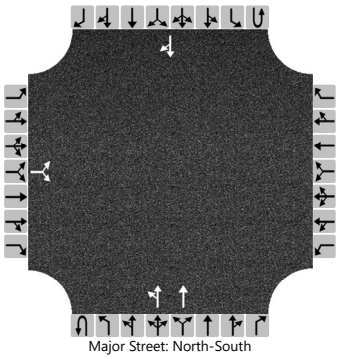
General Information

Analyst	LDK
Agency/Co.	KLEIN TRAFFIC CONSULTING
Date Performed	9/16/2022
Analysis Year	2022
Time Analyzed	AM PEAK HOUR
Intersection Orientation	North-South
Project Description	2022 EXISTING

Site Information

Intersection	MARIN BLVD WITH 16TH ST
Jurisdiction	JERSEY CITY
East/West Street	16TH STREET
North/South Street	MARIN BLVD
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		50		47						11	349				291	15
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.82		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			100							11						
Capacity, c (veh/h)			584							1249						
v/c Ratio			0.17							0.01						
95% Queue Length, Q_{95} (veh)			0.6							0.0						
Control Delay (s/veh)			12.4							7.9	0.1					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)		12.4								0.3						
Approach LOS		B								A						

HCS Two-Way Stop-Control Report

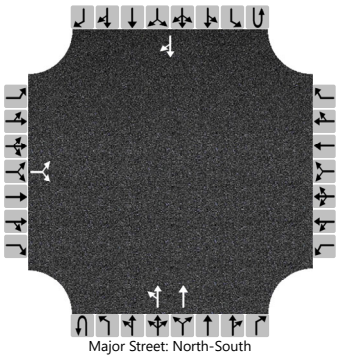
General Information

Analyst	LDK
Agency/Co.	KLEIN TRAFFIC CONSULTING
Date Performed	9/16/2022
Analysis Year	2022
Time Analyzed	PM PEAK HOUR
Intersection Orientation	North-South
Project Description	2022 EXISTING

Site Information

Intersection	MARIN BLVD WITH 16TH ST
Jurisdiction	JERSEY CITY
East/West Street	16TH STREET
North/South Street	MARIN BLVD
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		76		50						34	367				248	30
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.82		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

Delay, Queue Length, and Level of Service

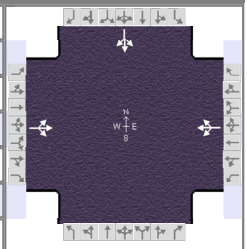
Flow Rate, v (veh/h)			148							40						
Capacity, c (veh/h)			502							1237						
v/c Ratio			0.30							0.03						
95% Queue Length, Q_{95} (veh)			1.2							0.1						
Control Delay (s/veh)			15.2							8.0	0.2					
Level of Service (LOS)			C							A	A					
Approach Delay (s/veh)		15.2								0.9						
Approach LOS		C								A						

NO-BUILD CONDITIONS

HCS PRINTOUTS

HCS Signalized Intersection Results Summary

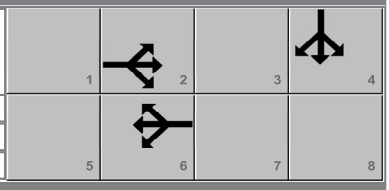
General Information				Intersection Information	
Agency	KLEIN TRAFFIC			Duration, h	0.250
Analyst	LDK	Analysis Date	Sep 14, 2022	Area Type	Other
Jurisdiction	JERSEY CITY	Time Period	AM PEAK HOUR	PHF	0.83
Urban Street	16TH ST	Analysis Year	2027 NO-BUILD	Analysis Period	1> 7:00
Intersection	GROVE/16TH	File Name	NB-AM-16-GR.xus		
Project Description	2027 NO-BUILD				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	51	121	180	13	10	5				14	334	7

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	56.5	23.5	0.0	0.0	0.0	0.0	
Yellow	3.0	3.0	0.0	0.0	0.0	0.0	
Red	2.0	2.0	0.0	0.0	0.0	0.0	



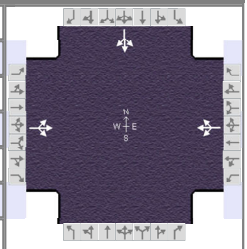
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6				4
Case Number		8.0		8.0				12.0
Phase Duration, s		61.5		61.5				28.5
Change Period, ($Y+R_c$), s		5.0		5.0				5.0
Max Allow Headway (*MAH*), s		0.0		0.0				3.2
Queue Clearance Time (g_s), s								22.6
Green Extension Time (g_e), s		0.0		0.0				0.9
Phase Call Probability								1.00
Max Out Probability								0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16				7	4	14
Adjusted Flow Rate (*v*), veh/h		424			34						428	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1596			1287						1812	
Queue Service Time (g_s), s		0.0			0.0						20.6	
Cycle Queue Clearance Time (g_c), s		11.5			0.6						20.6	
Green Ratio (*g/C*)		0.63			0.63						0.26	
Capacity (*c*), veh/h		1048			867						472	
Volume-to-Capacity Ratio (*X*)		0.405			0.039						0.906	
Back of Queue (*Q*), ft/ln (50 th percentile)												
Back of Queue (*Q*), veh/ln (50 th percentile)		4.1			0.2						9.2	
Queue Storage Ratio (*RQ*) (50 th percentile)		0.00			0.00						0.00	
Uniform Delay (d_1), s/veh		8.4			6.3						32.2	
Incremental Delay (d_2), s/veh		1.2			0.1						2.8	
Initial Queue Delay (d_3), s/veh		0.0			0.0						0.0	
Control Delay (*d*), s/veh		9.5			6.4						35.0	
Level of Service (LOS)		A			A						C	
Approach Delay, s/veh / LOS	9.5	A		6.4	A		0.0			35.0	C	
Intersection Delay, s/veh / LOS	21.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.35	A	1.35	A	1.72	B	1.72	B
Bicycle LOS Score / LOS	1.19	A	0.54	A			1.19	A

HCS Signalized Intersection Results Summary

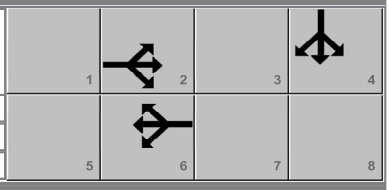
General Information				Intersection Information	
Agency	KLEIN TRAFFIC			Duration, h	0.250
Analyst	LDK	Analysis Date	Sep 14, 2022	Area Type	Other
Jurisdiction	JERSEY CITY	Time Period	PM PEAK HOUR	PHF	0.90
Urban Street	16TH ST	Analysis Year	2027 NO-BUILD	Analysis Period	1> 7:00
Intersection	GROVE/16TH	File Name	NB-PM-16-GR.xus		
Project Description	2027 NO-BUILD				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	97	126	74	30	40	9				13	389	35

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	53.3	26.7	0.0	0.0	0.0	0.0	
Yellow	3.0	3.0	0.0	0.0	0.0	0.0	
Red	2.0	2.0	0.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6				4
Case Number		8.0		8.0				12.0
Phase Duration, s		58.3		58.3				31.7
Change Period, ($Y+R_c$), s		5.0		5.0				5.0
Max Allow Headway (*MAH*), s		0.0		0.0				3.2
Queue Clearance Time (g_s), s								25.7
Green Extension Time (g_e), s		0.0		0.0				1.0
Phase Call Probability								1.00
Max Out Probability								0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16				7	4	14
Adjusted Flow Rate (*v*), veh/h		330			88						486	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1570			1486						1782	
Queue Service Time (g_s), s		5.1			0.0						23.7	
Cycle Queue Clearance Time (g_c), s		9.2			1.9						23.7	
Green Ratio (*g/C*)		0.59			0.59						0.30	
Capacity (*c*), veh/h		982			934						529	
Volume-to-Capacity Ratio (*X*)		0.336			0.094						0.917	
Back of Queue (*Q*), ft/ln (50 th percentile)												
Back of Queue (*Q*), veh/ln (50 th percentile)		3.4			0.7						10.4	
Queue Storage Ratio (*RQ*) (50 th percentile)		0.00			0.00						0.00	
Uniform Delay (d_1), s/veh		9.3			7.9						30.6	
Incremental Delay (d_2), s/veh		0.9			0.2						2.8	
Initial Queue Delay (d_3), s/veh		0.0			0.0						0.0	
Control Delay (*d*), s/veh		10.2			8.1						33.4	
Level of Service (LOS)		B			A						C	
Approach Delay, s/veh / LOS	10.2	B		8.1	A		0.0			33.4	C	
Intersection Delay, s/veh / LOS	22.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.36	A	1.36	A	1.72	B	1.72	B
Bicycle LOS Score / LOS	1.03	A	0.63	A			1.29	A

HCS Two-Way Stop-Control Report

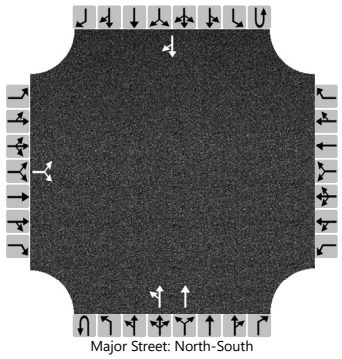
General Information

Analyst	LDK
Agency/Co.	KLEIN TRAFFIC CONSULTING
Date Performed	9/16/2022
Analysis Year	2027
Time Analyzed	AM PEAK HOUR
Intersection Orientation	North-South
Project Description	2027 NO-BUILD

Site Information

Intersection	MARIN BLVD WITH 16TH ST
Jurisdiction	JERSEY CITY
East/West Street	16TH STREET
North/South Street	MARIN BLVD
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		69		66						13	367				306	16
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.82		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			139							13						
Capacity, c (veh/h)			565							1231						
v/c Ratio			0.25							0.01						
95% Queue Length, Q_{95} (veh)			1.0							0.0						
Control Delay (s/veh)			13.4							8.0	0.1					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)	13.4								0.4							
Approach LOS	B								A							

HCS Two-Way Stop-Control Report

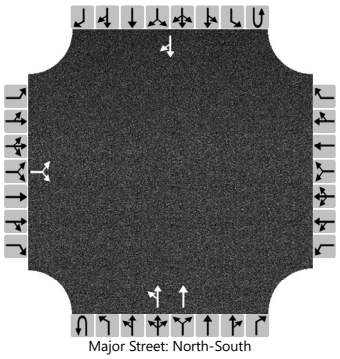
General Information

Analyst	LDK
Agency/Co.	KLEIN TRAFFIC CONSULTING
Date Performed	9/16/2022
Analysis Year	2027
Time Analyzed	PM PEAK HOUR
Intersection Orientation	North-South
Project Description	2027 NO-BUILD

Site Information

Intersection	MARIN BLVD WITH 16TH ST
Jurisdiction	JERSEY CITY
East/West Street	16TH STREET
North/South Street	MARIN BLVD
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		83		56						42	386				261	39
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.82		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

Delay, Queue Length, and Level of Service

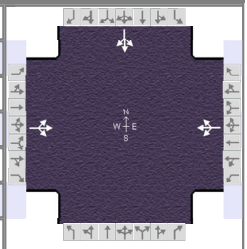
Flow Rate, v (veh/h)			164							49						
Capacity, c (veh/h)			470							1210						
v/c Ratio			0.35							0.04						
95% Queue Length, Q_{95} (veh)			1.5							0.1						
Control Delay (s/veh)			16.7							8.1	0.3					
Level of Service (LOS)			C							A	A					
Approach Delay (s/veh)		16.7								1.1						
Approach LOS		C								A						

BUILD CONDITIONS

HCS PRINTOUTS

HCS Signalized Intersection Results Summary

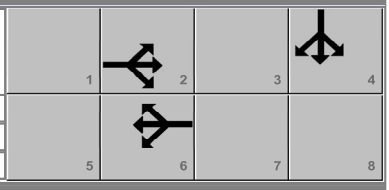
General Information				Intersection Information	
Agency	KLEIN TRAFFIC			Duration, h	0.250
Analyst	LDK	Analysis Date	Sep 14, 2022	Area Type	Other
Jurisdiction	JERSEY CITY	Time Period	AM PEAK HOUR	PHF	0.83
Urban Street	16TH ST	Analysis Year	2027 BUILD	Analysis Period	1> 7:00
Intersection	GROVE/16TH	File Name	B-AM-16-GR.xus		
Project Description	2027 BUILD				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	51	166	180	22	15	15				20	334	7

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	56.1	23.9	0.0	0.0	0.0	0.0	
Yellow	3.0	3.0	0.0	0.0	0.0	0.0	
Red	2.0	2.0	0.0	0.0	0.0	0.0	



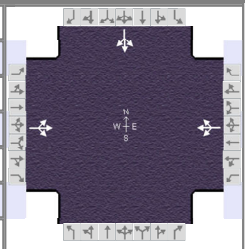
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6				4
Case Number		8.0		8.0				12.0
Phase Duration, s		61.1		61.1				28.9
Change Period, (*Y+R c*), s		5.0		5.0				5.0
Max Allow Headway (*MAH*), s		0.0		0.0				3.2
Queue Clearance Time (*g s*), s								23.0
Green Extension Time (*g e*), s		0.0		0.0				0.9
Phase Call Probability								1.00
Max Out Probability								0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16				7	4	14
Adjusted Flow Rate (*v*), veh/h		478			63						435	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1622			1251						1808	
Queue Service Time (*g s*), s		0.2			0.0						21.0	
Cycle Queue Clearance Time (*g c*), s		13.5			1.3						21.0	
Green Ratio (*g/C*)		0.62			0.62						0.27	
Capacity (*c*), veh/h		1057			838						479	
Volume-to-Capacity Ratio (*X*)		0.453			0.075						0.908	
Back of Queue (*Q*), ft/ln (50 th percentile)												
Back of Queue (*Q*), veh/ln (50 th percentile)		4.9			0.5						9.4	
Queue Storage Ratio (*RQ*) (50 th percentile)		0.00			0.00						0.00	
Uniform Delay (*d 1*), s/veh		8.9			6.6						32.0	
Incremental Delay (*d 2*), s/veh		1.4			0.2						2.8	
Initial Queue Delay (*d 3*), s/veh		0.0			0.0						0.0	
Control Delay (*d*), s/veh		10.3			6.8						34.8	
Level of Service (LOS)		B			A						C	
Approach Delay, s/veh / LOS	10.3	B		6.8	A		0.0			34.8	C	
Intersection Delay, s/veh / LOS	21.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.35	A	1.35	A	1.72	B	1.72	B
Bicycle LOS Score / LOS	1.28	A	0.59	A			1.21	A

HCS Signalized Intersection Results Summary

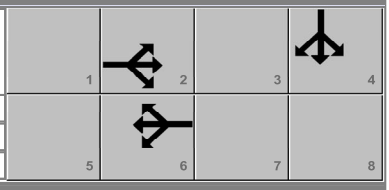
General Information				Intersection Information	
Agency	KLEIN TRAFFIC			Duration, h	0.250
Analyst	LDK	Analysis Date	Sep 14, 2022	Area Type	Other
Jurisdiction	JERSEY CITY	Time Period	PM PEAK HOUR	PHF	0.90
Urban Street	16TH ST	Analysis Year	2027 BUILD	Analysis Period	1> 7:00
Intersection	GROVE/16TH	File Name	B-PM-16-GR.xus		
Project Description	2027 BUILD				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	97	148	74	40	60	16				19	389	35

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	52.9	27.1	0.0	0.0	0.0	0.0	
Yellow	3.0	3.0	0.0	0.0	0.0	0.0	
Red	2.0	2.0	0.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6				4
Case Number		8.0		8.0				12.0
Phase Duration, s		57.9		57.9				32.1
Change Period, (*Y+R c*), s		5.0		5.0				5.0
Max Allow Headway (*MAH*), s		0.0		0.0				3.2
Queue Clearance Time (*g s*), s								26.0
Green Extension Time (*g e*), s		0.0		0.0				1.1
Phase Call Probability								1.00
Max Out Probability								0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16				7	4	14
Adjusted Flow Rate (*v*), veh/h		354			129						492	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1575			1494						1780	
Queue Service Time (*g s*), s		5.6			0.0						24.0	
Cycle Queue Clearance Time (*g c*), s		10.1			2.8						24.0	
Green Ratio (*g/C*)		0.59			0.59						0.30	
Capacity (*c*), veh/h		978			932						536	
Volume-to-Capacity Ratio (*X*)		0.362			0.138						0.918	
Back of Queue (*Q*), ft/ln (50 th percentile)												
Back of Queue (*Q*), veh/ln (50 th percentile)		3.7			1.1						10.5	
Queue Storage Ratio (*RQ*) (50 th percentile)		0.00			0.00						0.00	
Uniform Delay (*d 1*), s/veh		9.7			8.2						30.4	
Incremental Delay (*d 2*), s/veh		1.0			0.3						2.8	
Initial Queue Delay (*d 3*), s/veh		0.0			0.0						0.0	
Control Delay (*d*), s/veh		10.7			8.5						33.2	
Level of Service (LOS)		B			A						C	
Approach Delay, s/veh / LOS	10.7	B		8.5	A		0.0			33.2	C	
Intersection Delay, s/veh / LOS	21.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.36	A	1.36	A	1.72	B	1.72	B
Bicycle LOS Score / LOS	1.07	A	0.70	A			1.30	A

HCS Two-Way Stop-Control Report

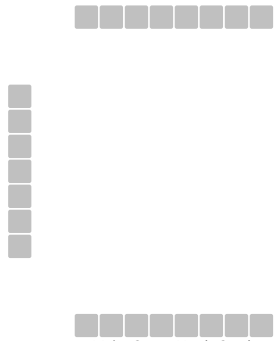
General Information

Analyst	LDK
Agency/Co.	KLEIN TRAFFIC CONSULTING
Date Performed	3/13/23
Analysis Year	2027
Time Analyzed	AM PEAK HOUR
Intersection Orientation	North-South
Project Description	2027 BUILD

Site Information

Intersection	MARIN BLVD WITH 16TH ST
Jurisdiction	JERSEY CITY
East/West Street	16TH STREET
North/South Street	MARIN BLVD
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		83		122						23	367				306	22
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.82		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			211							24						
Capacity, c (veh/h)			577							1225						
v/c Ratio			0.37							0.02						
95% Queue Length, Q_{95} (veh)			1.7							0.1						
Control Delay (s/veh)			14.8							8.0	0.2					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)		14.8								0.6						
Approach LOS		B								A						

HCS Two-Way Stop-Control Report

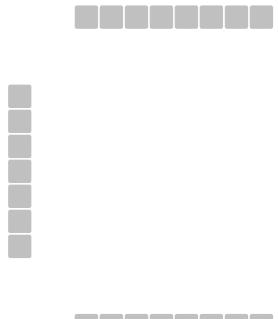
General Information

Analyst	LDK
Agency/Co.	KLEIN TRAFFIC CONSULTING
Date Performed	3/13/23
Analysis Year	2027
Time Analyzed	PM PEAK HOUR
Intersection Orientation	North-South
Project Description	2027 BUILD

Site Information

Intersection	MARIN BLVD WITH 16TH ST
Jurisdiction	JERSEY CITY
East/West Street	16TH STREET
North/South Street	MARIN BLVD
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		89		77						61	386				261	54
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.82		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			195							72						
Capacity, c (veh/h)			452							1192						
v/c Ratio			0.43							0.06						
95% Queue Length, Q_{95} (veh)			2.1							0.2						
Control Delay (s/veh)			18.9							8.2	0.4					
Level of Service (LOS)			C							A	A					
Approach Delay (s/veh)		18.9								1.5						
Approach LOS		C								A						

HCS Two-Way Stop-Control Report

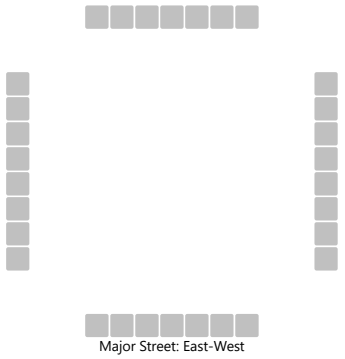
General Information

Analyst	LDK
Agency/Co.	KLEIN TRAFFIC CONSULTING
Date Performed	3/13/23
Analysis Year	2027
Time Analyzed	AM PEAK HOUR
Intersection Orientation	East-West
Project Description	2027 BUILD

Site Information

Intersection	16TH STREET WITH SITE DRIVEWAY
Jurisdiction	JERSEY CITY
East/West Street	16TH STREET
North/South Street	SITE DRIVEWAY
Peak Hour Factor	0.83
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			135	53		14	28			23		69				
Percent Heavy Vehicles (%)						1				1		1				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.11				6.41		6.21				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.51		3.31				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						17					111					
Capacity, c (veh/h)						1348					813					
v/c Ratio						0.01					0.14					
95% Queue Length, Q_{95} (veh)						0.0					0.5					
Control Delay (s/veh)						7.7	0.1				10.1					
Level of Service (LOS)						A	A				B					
Approach Delay (s/veh)					2.6				10.1							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

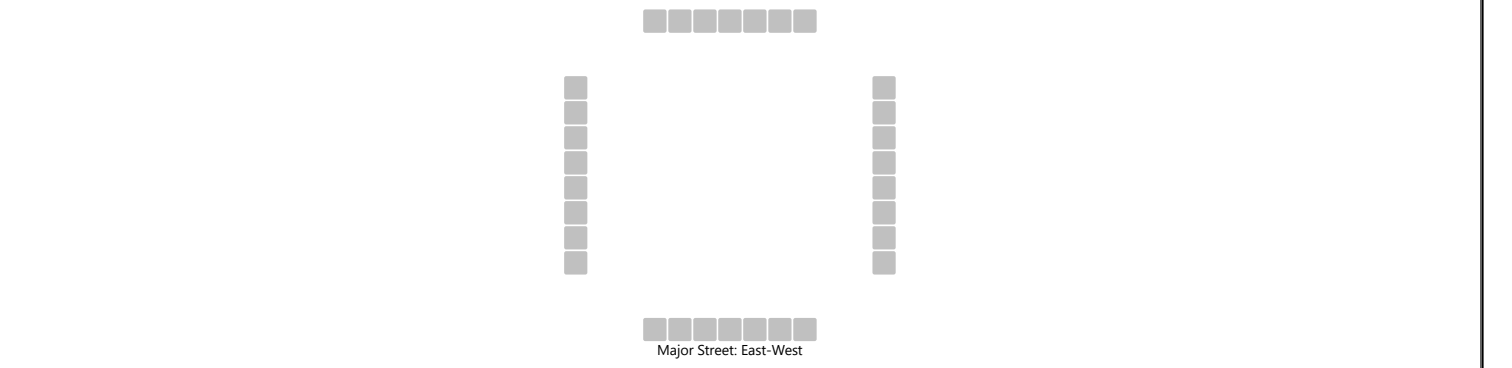
General Information

Analyst	LDK
Agency/Co.	KLEIN TRAFFIC CONSULTING
Date Performed	3/13/23
Analysis Year	2027
Time Analyzed	PM PEAK HOUR
Intersection Orientation	East-West
Project Description	2027 BUILD

Site Information

Intersection	16TH STREET WITH SITE DRIVEWAY
Jurisdiction	JERSEY CITY
East/West Street	16TH STREET
North/South Street	SITE DRIVEWAY
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			166	28		35	80			35		28				
Percent Heavy Vehicles (%)						1				1		1				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.11				6.41		6.21				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.51		3.31				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						39					70					
Capacity, c (veh/h)						1360					700					
v/c Ratio						0.03					0.10					
95% Queue Length, Q_{95} (veh)						0.1					0.3					
Control Delay (s/veh)						7.7	0.2				10.7					
Level of Service (LOS)						A	A				B					
Approach Delay (s/veh)						2.5				10.7						
Approach LOS						A				B						