



TREBILCOCK
CONSULTING SOLUTIONS

Vehicular Circulation Study

NCH Heart Vascular & Stroke Institute Expansion Attachment C-1

City of Naples, Florida
11/27/2023

Prepared for:

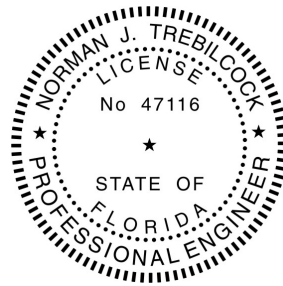
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Statement of Certification

I certify that this Vehicular Circulation Study has been prepared by me or under my immediate supervision and that I have experience and training in the field of Traffic and Transportation Engineering.



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Table of Contents

Description	4
Intersection Configurations	5
Intersection Traffic Volumes.....	6
Intersection Capacity Analyses	7
Intersection Improvements	9
Parking Garage Circulation.....	9

Appendices

Appendix A: ITE Trip Generation Calculations	11
Appendix B: Existing Intersection Lane Configurations	15
Appendix C: April 18, 2023, Intersection Traffic Counts	18
Appendix D: Projected Traffic at Subject Intersections	23
Appendix E: Intersection Analyses – Synchro Reports.....	29

Description

The purpose of this report is to evaluate traffic operations for the following intersections to remain:

- 4th Ave N and 7th St N
- 2nd Ave N and 7th St N

There are two existing accesses to be closed at 6th St N / 3rd Ave N and 2nd Ave N / Telford Physician Driveway. This analysis will help determine whether the closure of the two existing accesses creates issues for the two intersections remaining within the project improvement area after the improvements are completed and into the future.

The property contains the NCH Baker Hospital which is a multi-story building and has a total occupied area of 445,607 square feet (sf) and includes the Emergency Room (ER) Department (also known as ED) per NCH’s Architect, Studio+. The Hospital square footage does not include the collocated Telford Education Building (also known as the Briggs Pavilion). The Telford Education Building consists of a garage with adjacent surface parking and 48,000 sf +/- of occupiable space.

The project proposes demolishing the adjacent existing Telford Education Building and constructing a 189,467-sf hospital expansion. In addition, the subject application proposes reconfiguring the west Parking Lot to allow for a new Parking Garage and reconfigured surface parking (488 parking spaces proposed). The proposed expansion represents nearly a 30% increase in the hospital occupied area (including Telford Education Building).

The proposed improvement area reconfigured west parking lot and new parking garage accounts for less than 25% of the available hospital parking (488/1,970 parking spaces). This vehicle circulation study analyzes the operational traffic impacts to the two 7th Street N accesses in the expansion area with over 70% of the total hospital traffic using this area (463,365sf/635,074sf), though this area provides less than 25% of the available parking.

The development traffic generation is evaluated based on the methodologies and traffic data illustrated in the Institute of Transportation Engineers (ITE) Trip Generation Manual (TGM), 11th Edition and it is provided in **Appendix A**. The proposed buildout development scenario is illustrated in **Table 1**.

Table 1
Development Program

Development	Land Use	ITE Land Use Code	Total Size
Existing Main ⁽¹⁾	Hospital	#610 – Hospital	445,607 sf
Proposed Expansion	Hospital	#610 – Hospital	189,467 sf
Total			635,074, sf

Note(s): (1) Excludes Existing Telford Education Building – 48ksf (+/-). Includes the ER Department. .

Consistent with the companion document titled Traffic Impact Statement (TIS), [Attachment C-12] and dated contemporaneously, year 2045 is selected as the analysis year to evaluate the potential transportation impacts. Traffic analyses are conducted for the subject intersections based on the projected 2045 Peak Season Background traffic growth plus Project Traffic Conditions.

Intersection Configurations

Existing Intersection Configurations

Existing intersection lane configurations are depicted in **Appendix B**.

4th Ave N and 7th St N: one westbound left-turn lane on 4th Ave N – 125 ft (storage lane; no taper).

Future Intersection Configurations – Non-Project Related Improvements

No committed intersection improvements are identified in the City of Naples Five-Year Work Program for the analyzed locations.

Future Intersection Configurations – Project Related Improvements

This analysis evaluates the project related improvements as recommended in the companion TIS.

2nd Ave N and 7th St N: one westbound right-turn lane on 2nd Ave N – 170 ft (includes 50 ft taper).

Intersection Traffic Volumes

2023 Peak Season Background Traffic

To support this traffic analysis, intersection traffic counts were conducted on Tuesday, April 18, 2023. AM and PM peak period turning movement data were collected in 15-minute intervals from 7-9 AM, and from 4-6 PM.

A summary of the intersection turning movement counts is provided in **Appendix C: April 18, 2023 Intersection Traffic Counts**.

Traffic count volumes collected are adjusted for peak season conditions by using the peak season conversion factor (PSCF) for the week of the count as illustrated in the latest 2022 FDOT Peak Season Factor Category Report (reference **Appendix D**).

Based on our evaluation of the traffic data provided for the year 2022, a PSCF value of 1.07 is utilized in this report.

2045 Peak Season Background Traffic

The method used in the companion TIS to predict future roadway segment volumes provides projected annual growth rates for each analyzed roadway segment. These annual growth rates are used to estimate future 2045 intersection background traffic volumes.

Intersection traffic projections coincident with the future 2045 forecast year are presented in **Appendix D: Projected Traffic at Subject Intersections**.

Project Traffic

The traffic volumes and the various percentages that form the development traffic turning movements at the subject intersections (**Appendix D**) are consistent with the project traffic distribution percentages reported in the TIS prepared in support of this project.

2045 Peak Season Background with Project Traffic

The development traffic volumes are added to the projected 2045 peak season background volumes to estimate the future 2045 peak season traffic volumes with the subject project. For details refer to **Appendix D**.

Intersection Capacity Analyses

An assessment of the Level of Service (LOS) and volume to capacity (V/C) ratio analysis of the subject intersections are conducted using Synchro software, Version 11.

The operations at the subject unsignalized intersections are assessed based on HCM 6th Edition methodologies.

LOS Criteria

LOS is defined in terms of the average vehicle delay. For the purposes of this report, an adequate LOS for each movement is considered when the LOS E is not exceeded.

TWSC intersection LOS

For two-way stop-controlled intersections, the LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This is because the performance of a two-way, stop-controlled intersection is more closely reflected in terms of its individual movements, rather than its performance overall. For this reason, LOS for a two-way, stop-controlled intersection is defined in terms of its individual movements.

Volume to Capacity Ratio

The volume to capacity ratio (V/C), also referred to as degree of saturation, represents the sufficiency of an intersection to accommodate the vehicular demand. A V/C ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the V/C ratio approaches 1.0, traffic flow may become unstable, and delay and queuing conditions may occur. Once the demand exceeds the capacity (a V/C ratio greater than 1.0), traffic flow is unstable and excessive delay and queuing is expected. Under these conditions vehicles may require more than one signal cycle to pass through the intersection (known as cycle failure). For design purposes, a V/C ratio between 0.85 and 0.95 is generally utilized for the peak hour of the horizon year.

As such, each intersection movement is analyzed to ensure that the threshold value of V/C failure (1.0) is not reached.

Collier County – Control Delay and V/C Ratio for Individual Traffic Movements

In agreement with Collier County Traffic Impact Study Guidelines and Procedures, Section 13, the average control delays up to 100 seconds are considered acceptable for individual turning movements and through movements where the corresponding V/C ratio is less than 0.8.

Percent Heavy Vehicle

The Percent Heavy Vehicle (PHV) – the percent of trucks expected to use the roadway segment during the peak hour. A minimum PHV value of 2% is considered for all movements.

The intersection analyses for future traffic conditions reflect counted peak hour truck percentages as illustrated in the peak hour turning movement counts (**Appendix C**).

Peak Hour Factor (PHF)

PHF is the ratio of the hourly volume to the peak 15-minute flow rate for that hour. As illustrated in **Appendix C**, the raw intersection turning movement counts provide the current 2023 traffic PHF value for each intersection.

Per data illustrated in the latest FDOT 2023 Quality/Level of Service Handbook (Q/LOS Handbook), Section 6.3, the PHF values were updated to be based on FDOT context classification. These values were previously based on area type.

The Florida’s Generalized Service Volume Tables utilize a PHF of 0.92 for the Suburban Residential (C3R) context classification, as referenced in the 2023 Q/LOS Handbook, Section 6.3 (Table 5).

Based on the projected vehicular volumes, intersection geometric configuration and engineering judgement, this report considers a PHF value of 0.92 for all 2045 year traffic analyses.

Synchro Analyses Results

The results of the Synchro intersection analyses for AM and PM peak hour traffic conditions are summarized in **Table 2**. Synchro intersection worksheets are provided in **Appendix E: Intersection Analyses – Synchro Reports**.

Table 2
Intersection Capacity Analysis – Level of Service

Intersection	Level of Service Peak Hour	
	AM	PM
Year 2025 Background Traffic with Project		
4th Ave N and 7th St N⁽¹⁾	A / A	A / B
2nd Ave N and 7th St N⁽²⁾	A / A	A / A

Note(s): (1) TWSC intersection – major street WB left-turn/minor street NB approach LOS reported – HCM 6 method.
(2) TWSC intersection – major street EB left-turn/ minor street SB approach LOS reported – HCM 6 method.

Based upon the results of the capacity analysis, the subject intersections are shown to operate with adequate LOS in the year 2045 with the proposed development traffic added to the intersection background traffic.

Intersection Improvements

In agreement with the data provided in **Appendix E**, a queue analysis is performed for the impacted turn lanes using the Synchro software to obtain the LOS and the 95th percentile queue length (refer to **Table 3**). The 95th – percentile queue is the queue length (feet or vehicles) that has only a 5% probability of being exceeded during the analysis time period.

For the purposes of this report, the minimum queue length considered is 25 feet and the queue per vehicle is 25 feet. Queue lengths are rounded to the nearest 25 foot interval.

Table 3
Intersection Impacted Turn Lanes – LOS and Storage Analysis

Intersection/Movement	Available Storage (feet) # of Lanes/Length ⁽¹⁾	2045 Background Traffic with Project AM/PM Peak Hour	
		LOS ⁽²⁾	95 th Queue ⁽²⁾ (feet)
4 th Ave N and 7 th St N - Westbound Left	1/125	A/A	25/25
2 nd Ave N and 7 th St N - Westbound Right	1/120	A/A	0/0 ⁽³⁾

Note(s): (1) Transition taper length is in addition to the lane storage length, as applicable.
(2) Refer to **Appendix E**.
(3) Free flow maneuver.

The impacted turn lanes do not exceed the minimum acceptable LOS standard. In addition, the required queue is not projected to exceed the available storage length.

Parking Garage Circulation

The parking garage will have two accesses, one at the NW corner connecting to the surface parking lot and the other at the NE corner of the garage, connecting to 7th St N. The NE garage access will be in line with the valet drop off lane for the Heart Institute Hospital Expansion. The valet drop off will be covered. Valet operations will not occur within the public right of way and so are not required to meet Section 36-67 public ROW criteria. Valet signage and directional markers will be provided. A separate Valet Parking Operations Plan (Attachment C-3) is being created for review and conditional use approval by the City Council. The garage is designed for two-way traffic flow within the parking aisles and circulation between parking levels. Two-way travel way widths will be 24 ft.

The multiple garage levels will be as follows: Level 1 Valet Parking (44 spaces) and Public Handicap Parking (5 spaces). Level 2 = Public Parking (108 spaces). Level 3 = Physician Parking (108 spaces). Level 4 = Additional Public Parking (106 spaces). The parking garage will provide internal site stacking at the at grade parking lot for the NW garage access and along 7th St N for the NE garage access. Both overflow areas are internal to the hospital property and not on public streets. The 7th St N access is over 300 ft from 2nd Ave N and over 400 ft from 4th Ave N. The NW access is further away within the at grade parking lot.

This 371-space garage is comparably sized (same number of levels) as well as with the same number of accesses (2) as the City’s’ parking garages [i.e., 4th Ave S/8th St S, 340+/- space garage; 6th Ave S/8th St S, 339 +/- space garage; and proposed 1st Ave S/12th St S (Gulfshore Playhouse), 350+/- space garage].

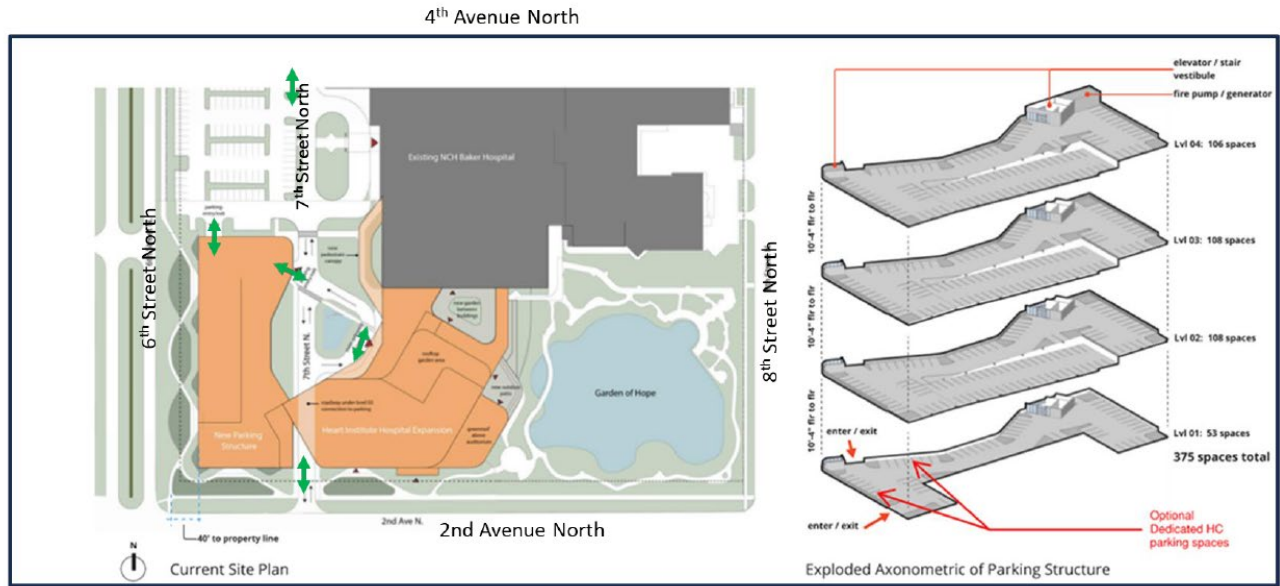


Figure 1 Site Plan Detail (orange) of Garage (left) and Proposed Hospital Expansion (right), as well as exploded garage levels (far right).

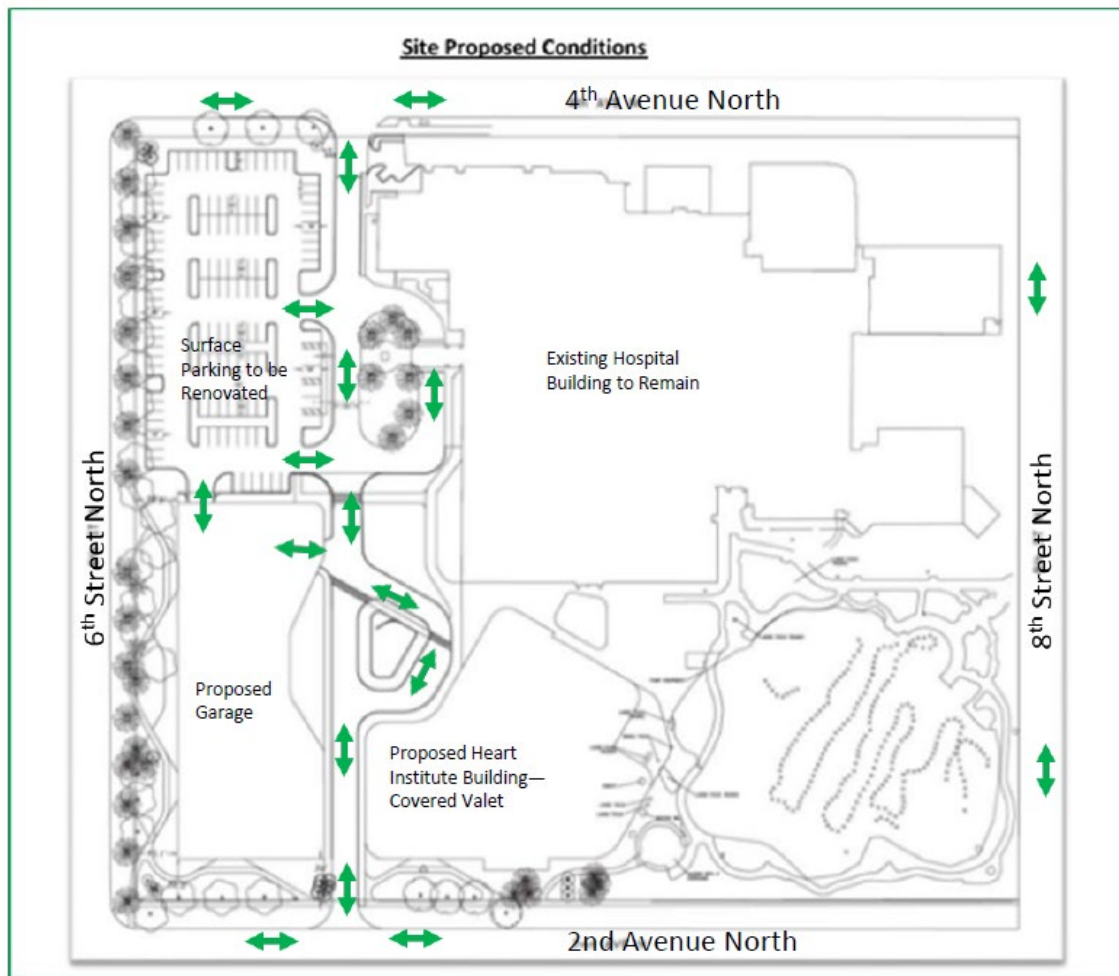


Figure 2: Site Plan of Traffic Flow externally and internally to the site of the proposed garage and proposed Heart Institute Building.

Appendix A:
ITE Trip Generation Calculations

Proposed Hospital Expansion + Existing

Project Information							
Project Name:	NCH Heart Institute Total--Exist and Proposed						
No:							
Date:	11/23/2023						
City:	Naples						
State/Province:	FL						
Zip/Postal Code:	34102						
Country:	United States						
Client Name:	Naples Community Hospital						
Analyst's Name:	NJT						
Edition:	Trip Generation Manual, 11th Ed						

Land Use	Size	Weekday		AM Peak Hour		PM Peak Hour	
		Entry	Exit	Entry	Exit	Entry	Exit
610 - Hospital (General Urban/Suburban)	635.07 1000 Sq. Ft. GFA	3420	3420	349	172	191	355
Reduction		0	0	0	0	0	0
Internal		0	0	0	0	0	0
Pass-by		0	0	0	0	0	0
Non-pass-by		3420	3420	349	172	191	355
Total		3420	3420	349	172	191	355
Total Reduction		0	0	0	0	0	0
Total Internal		0	0	0	0	0	0
Total Pass-by		0	0	0	0	0	0
Total Non-pass-by		3420	3420	349	172	191	355

Hospital Operations/Circulation Area Analysis Evaluated at Impacted Intersections (463,365 sf>70% of buildout—635,074 sf)

Project Name:	Total NCH Downtown	No:	
Date:	11/21/2023	City:	
State/Province:		Zip/Postal Code:	
Country:		Client Name:	
Analyst's Name:		Edition:	Trip Generation Manual, 11th Ed

LAND USE	SIZE	WEEKDAY		AM PEAK HOUR		PM PEAK HOUR	
		Entry	Exit	Entry	Exit	Entry	Exit
610 - Hospital (General Urban/Suburban)	463.37 ⁽¹⁾	2495	2495	255	125	139	259
Reduction		0	0	0	0	0	0
Internal		0	0	0	0	0	0
Pass-by		0	0	0	0	0	0
Non-pass-by		2495	2495	255	125	139	259
Total		2495	2495	255	125	139	259
Total Reduction		0	0	0	0	0	0
Total Internal		0	0	0	0	0	0
Total Pass-by		0	0	0	0	0	0
Total Non-pass-by		2495	2495	255	125	139	259

(1) 1000 Sq. Ft. GFA

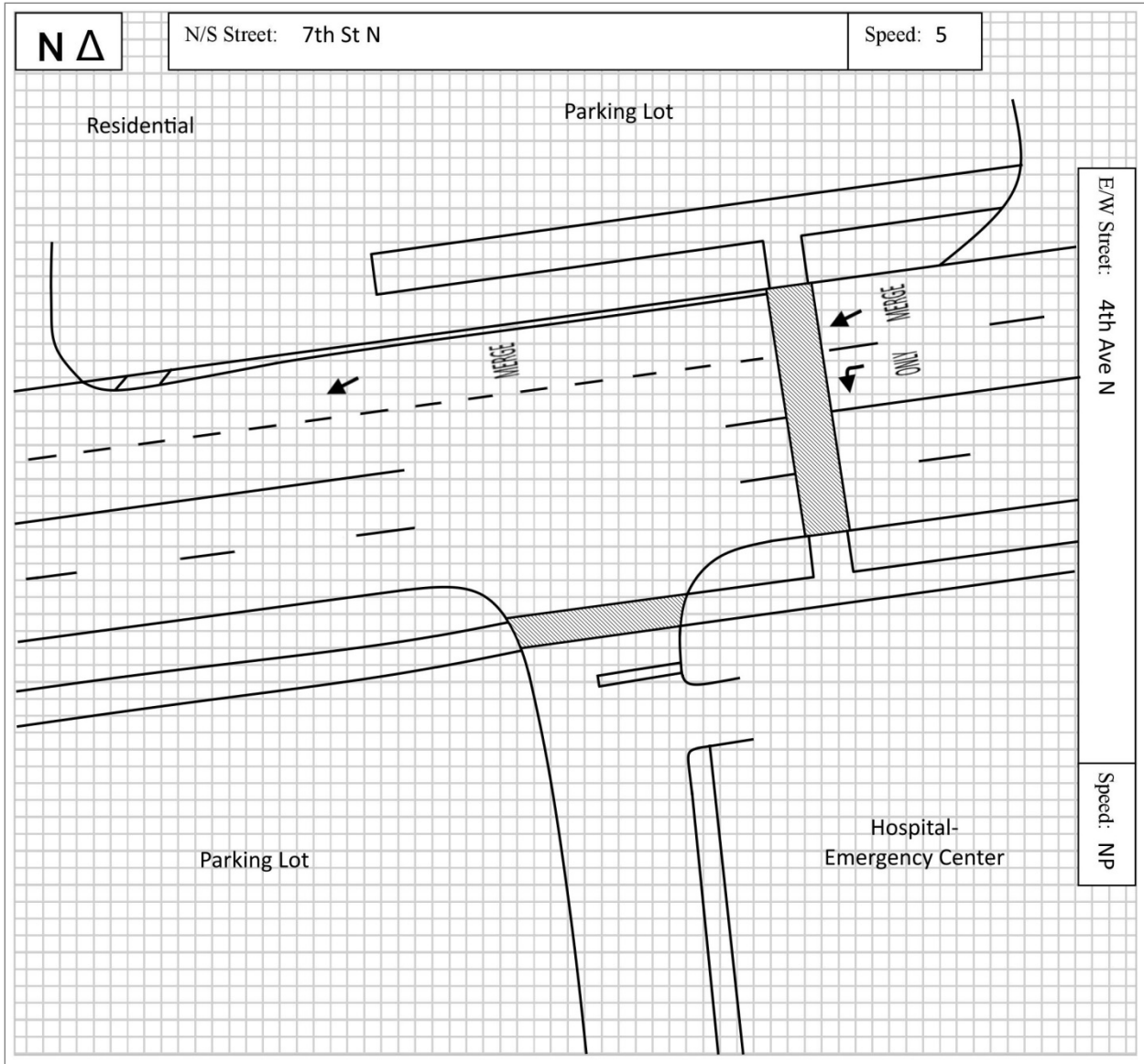
PERIOD SETTING							
Analysis Name :	Weekday						
Project Name :	Total NCH Downtown	No :					
Date:	11/21/2023	City:					
State/Province:		Zip/Postal Code:					
Country:		Client Name:					
Analyst's Name:		Edition:	Trip Generation Manual, 11th Ed				

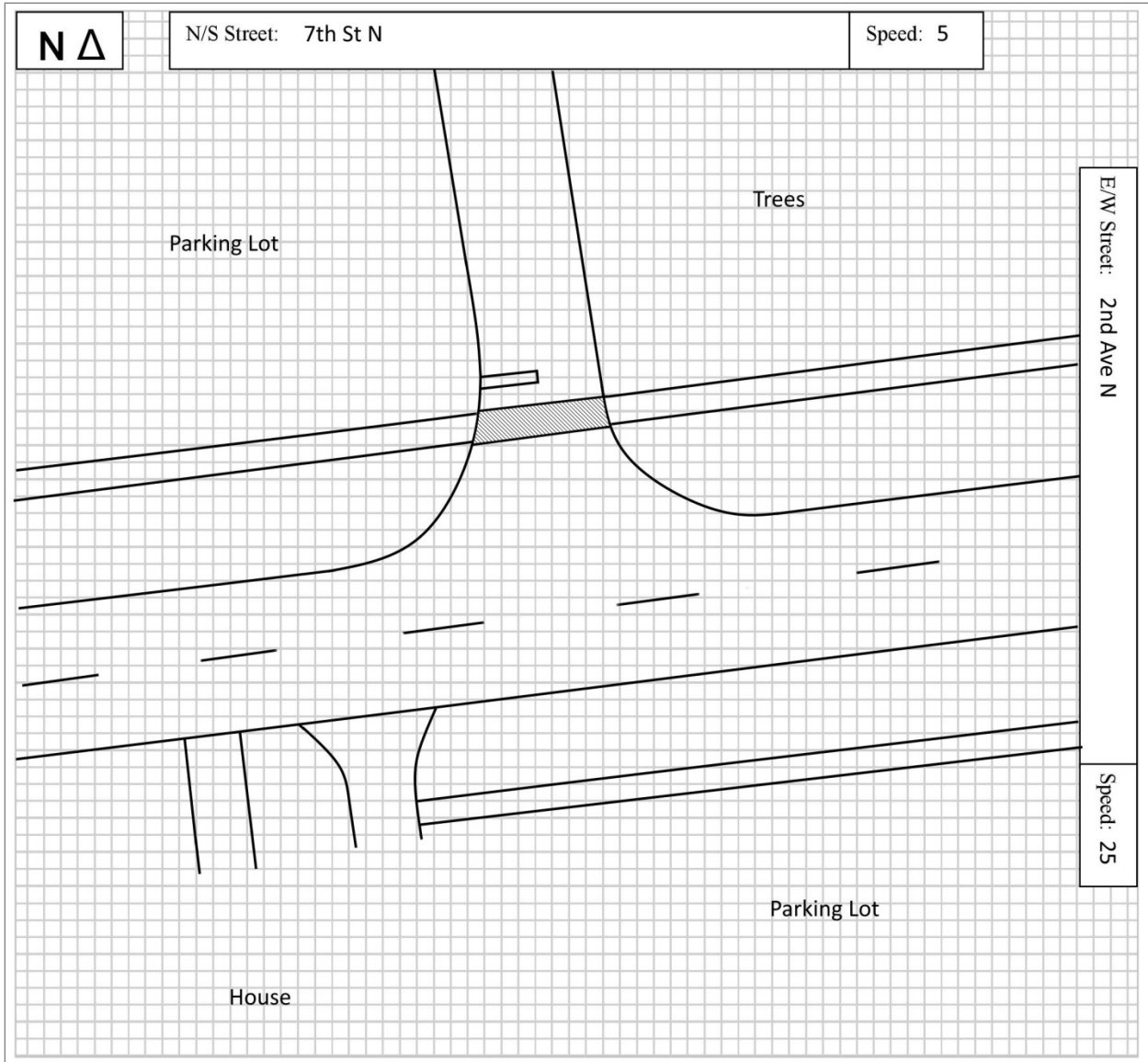
Land Use	Independent Variable	Size	Time Period	Method	Entry	Exit	Total
610 - Hospital (General Urban/Suburban)	1000 Sq. Ft. GFA	463.37	Weekday	Average 10.77	2495 50%	2495 50%	4990

PERIOD SETTING							
Analysis Name :	AM Peak Hour						
Project Name :	Total NCH Downtown	No :					
Date:	11/21/2023	City:					
State/Province:		Zip/Postal Code:					
Country:		Client Name:					
Analyst's Name:		Edition:	Trip Generation Manual, 11th Ed				
Land Use	Independent Variable	Size	Time Period	Method	Entry	Exit	Total
610 - Hospital (General Urban/Suburban)	1000 Sq. Ft. GFA	463.37	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Average 0.82	255 67%	125 33%	380

PERIOD SETTING							
Analysis Name :	PM Peak Hour						
Project Name :	Total NCH Downtown	No :					
Date:	11/21/2023	City:					
State/Province:		Zip/Postal Code:					
Country:		Client Name:					
Analyst's Name:		Edition:	Trip Generation Manual, 11th Ed				
Land Use	Independent Variable	Size	Time Period	Method	Entry	Exit	Total
610 - Hospital (General Urban/Suburban)	1000 Sq. Ft. GFA	463.37	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Average 0.86	139 35%	259 65%	398

Appendix B:
Existing Intersection Lane Configurations





Appendix C:

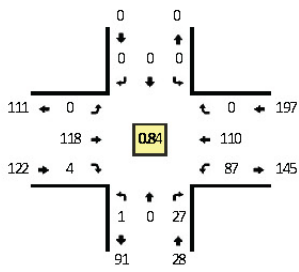
April 18, 2023, Intersection Traffic Counts

Type of peak hour being reported: Intersection Peak

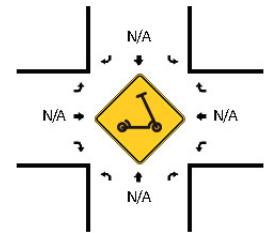
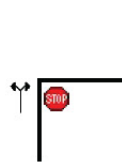
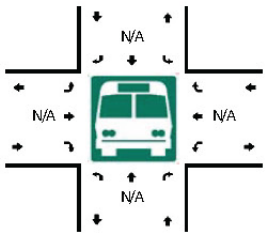
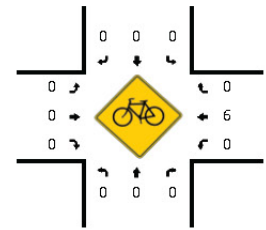
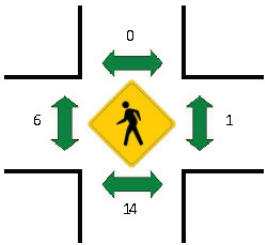
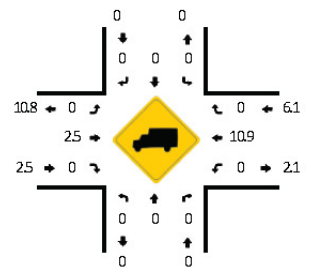
Method for determining peak hour: Total Entering Volume

LOCATION: 7th St N -- 4th Ave N
CITY/STATE: Naples, FL

QC JOB #: 16164303
DATE: Tue, Apr 18 2023



Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:45 AM -- 9:00 AM



R* = RTOR

15-Min Count Period Beginning At	7th St N (Northbound)					7th St N (Southbound)					4th Ave N (Eastbound)					4th Ave N (Westbound)					Total	Hourly Totals
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*		
7:00 AM	0	0	4	0	0	0	0	0	0	0	0	9	0	0	0	11	14	0	0	0	38	
7:15 AM	0	0	6	0	0	0	0	0	0	0	0	6	2	0	0	16	25	0	0	0	55	
7:30 AM	0	0	4	0	0	0	0	0	0	0	0	17	0	0	0	20	23	0	0	0	64	
7:45 AM	0	0	5	0	0	0	0	0	0	0	0	19	1	0	0	20	16	0	0	0	61	218
8:00 AM	0	0	7	0	0	0	0	0	0	0	0	24	0	0	0	21	26	0	0	0	78	258
8:15 AM	0	0	9	0	0	0	0	0	0	0	0	21	1	0	0	17	33	0	0	0	81	284
8:30 AM	0	0	3	0	0	0	0	0	0	0	0	25	2	0	0	26	29	0	0	0	85	305
8:45 AM	1	0	8	0	0	0	0	0	0	0	0	48	1	0	0	23	22	0	0	0	103	347
Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound					Total	
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*		
All Vehicles	4	0	32	0	0	0	0	0	0	0	0	192	4	0	0	92	88	0	0	0	412	
Heavy Trucks	0	0	0			0	0	0			0	8	0			0	12	0			20	
Buses																						
Pedestrians		28										0					0				28	
Bicycles	0	0	0			0	0	0			0	0	0			0	8	0			8	
Scoters																						

Comments:

Report generated on 5/3/2023 10:07 AM

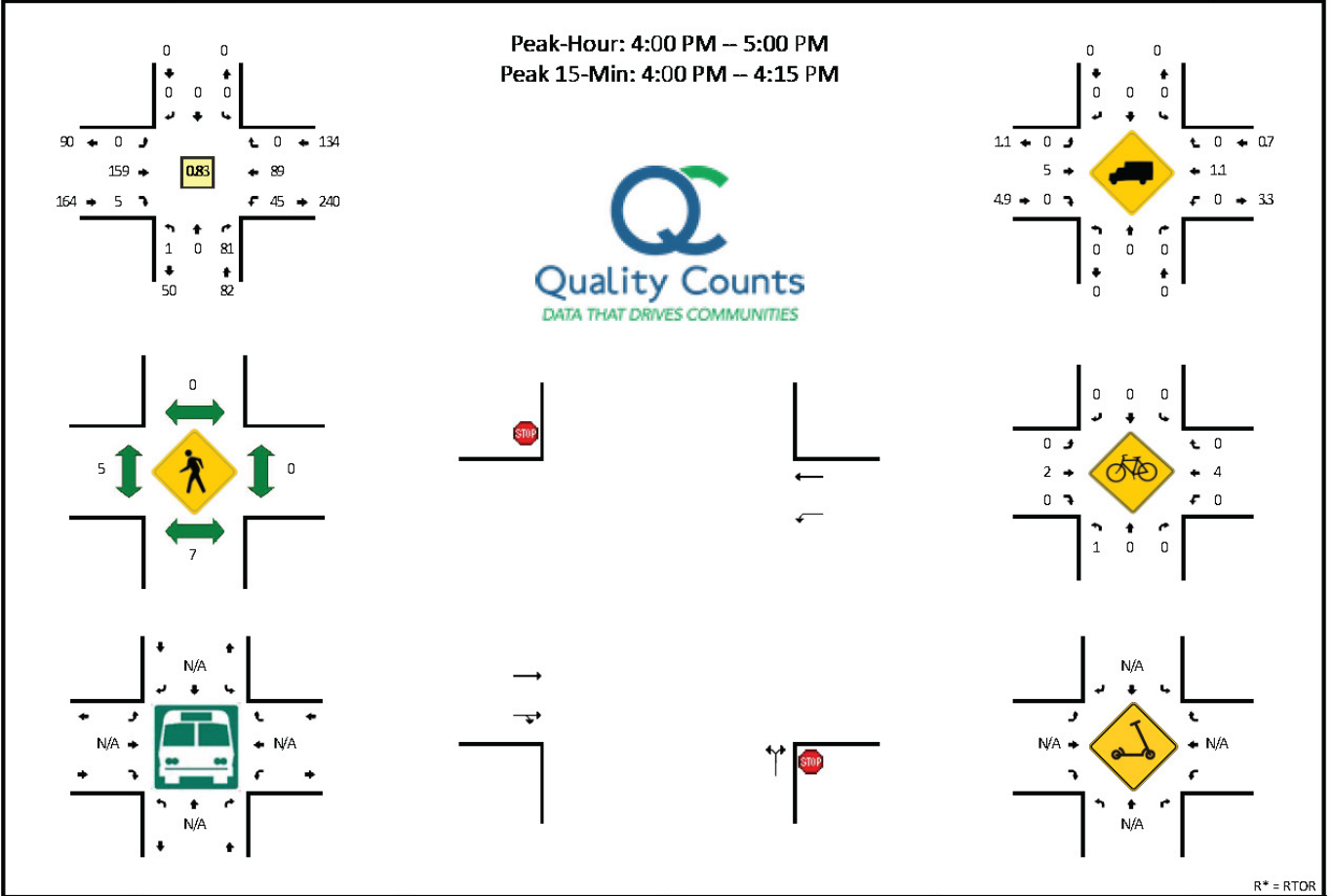
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: 7th St N -- 4th Ave N
CITY/STATE: Naples, FL

QC JOB #: 16164304
DATE: Tue, Apr 18 2023



R* = RTOR

15-Min Count Period Beginning At	7th St N (Northbound)				7th St N (Southbound)				4th Ave N (Eastbound)				4th Ave N (Westbound)				Total	Hourly Totals				
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left			Thru	Right	U	R*
4:00 PM	0	0	20	0	0	0	0	0	0	0	0	64	1	0	0	8	22	0	0	0	115	
4:15 PM	1	0	22	0	0	0	0	0	0	0	0	46	0	0	0	17	25	0	0	0	111	
4:30 PM	0	0	24	0	0	0	0	0	0	0	0	30	2	0	0	8	23	0	0	0	87	
4:45 PM	0	0	15	0	0	0	0	0	0	0	0	19	2	0	0	12	19	0	0	0	67	380
5:00 PM	3	0	24	0	0	0	0	0	0	0	0	35	1	0	0	8	12	0	0	0	83	348
5:15 PM	0	0	21	0	0	0	0	0	0	0	0	20	0	0	0	13	18	0	0	0	72	309
5:30 PM	0	0	15	0	0	0	0	0	0	0	0	19	1	0	0	23	18	0	0	0	76	298
5:45 PM	0	0	23	0	0	0	0	0	0	0	0	16	1	0	0	14	20	0	0	0	74	305
Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound					Total	
All Vehicles	0	0	80	0	0	0	0	0	0	0	0	256	4	0	0	32	88	0	0	0	460	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0	0	0	8	
Buses																						
Pedestrians		12					0					8					0				20	
Bicycles	0	0	0			0	0	0			0	4	0			0	12	0			16	
Scooters																						

Comments:

Report generated on 5/3/2023 10:07 AM

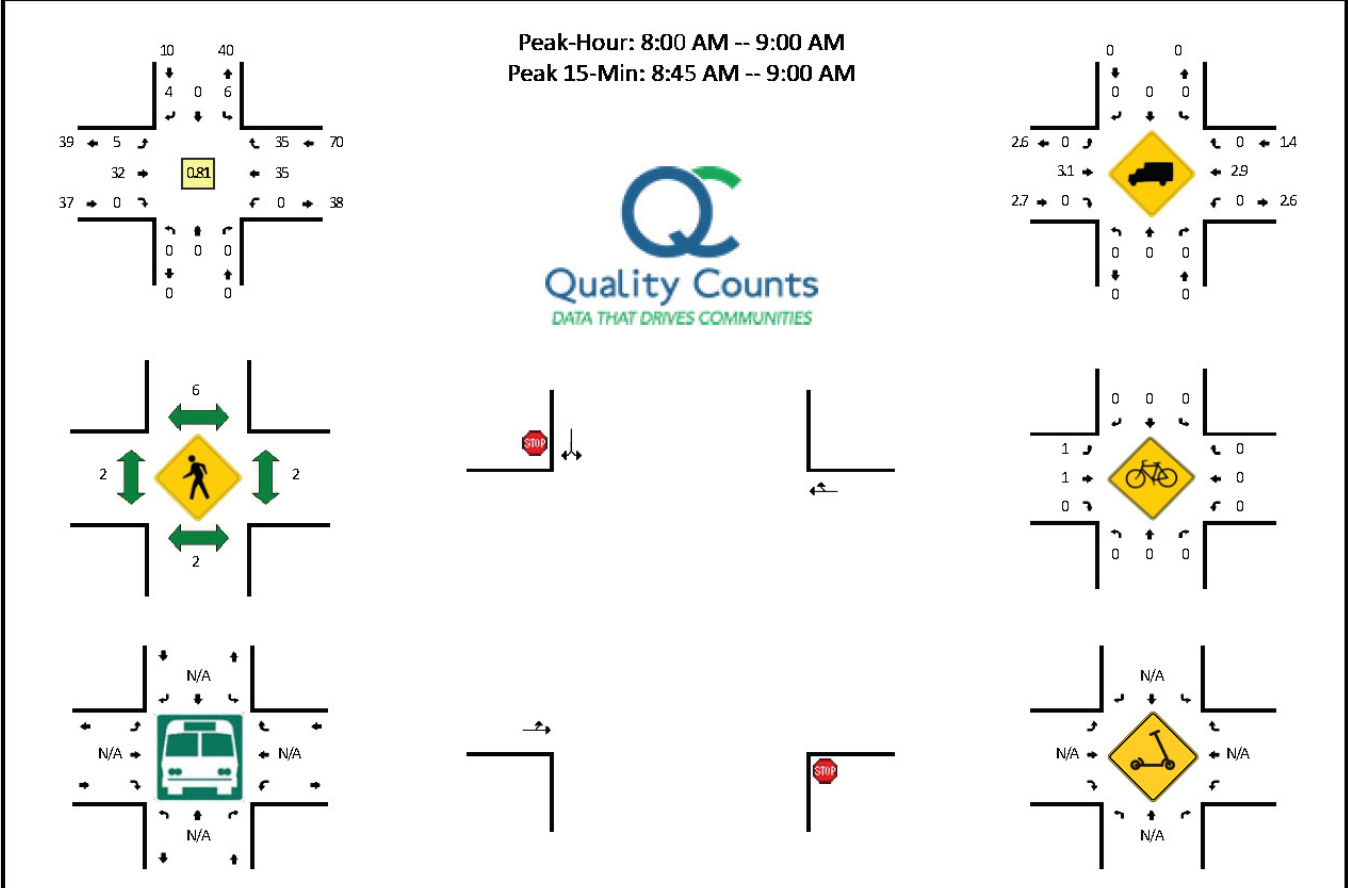
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: 7th St N -- 2nd Ave N
CITY/STATE: Naples, FL

QC JOB #: 16164305
DATE: Tue, Apr 18 2023



R* = RTOR

15-Min Count Period Beginning At	7th St N (Northbound)					7th St N (Southbound)					2nd Ave N (Eastbound)					2nd Ave N (Westbound)					Total	Hourly Totals
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*		
7:00 AM	0	0	0	0	0	2	0	0	0	0	2	2	0	0	0	0	4	2	0	0	12	
7:15 AM	0	0	0	0	0	3	0	1	0	0	0	4	0	0	0	0	4	0	0	0	12	
7:30 AM	0	0	0	0	0	2	0	0	0	0	0	4	0	0	0	0	2	3	0	0	11	
7:45 AM	0	0	0	0	0	2	0	2	0	0	0	3	0	0	0	0	4	5	0	0	16	51
8:00 AM	0	0	0	0	0	1	0	0	0	0	1	6	0	0	0	0	11	11	0	0	30	69
8:15 AM	0	0	0	0	0	1	0	1	0	0	1	4	0	0	0	0	8	12	0	0	27	84
8:30 AM	0	0	0	0	0	3	0	1	0	0	0	11	0	0	0	0	3	6	0	0	24	97
8:45 AM	0	0	0	0	0	1	0	2	0	0	3	11	0	0	0	0	13	6	0	0	36	117
Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound					Total	
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*		
All Vehicles	0	0	0	0	0	4	0	8	0	0	12	44	0	0	0	0	52	24	0	0	144	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0	0	0	8	
Buses																						
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0	0	0	8	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	
Scoters																						

Comments:

Report generated on 5/3/2023 10:07 AM

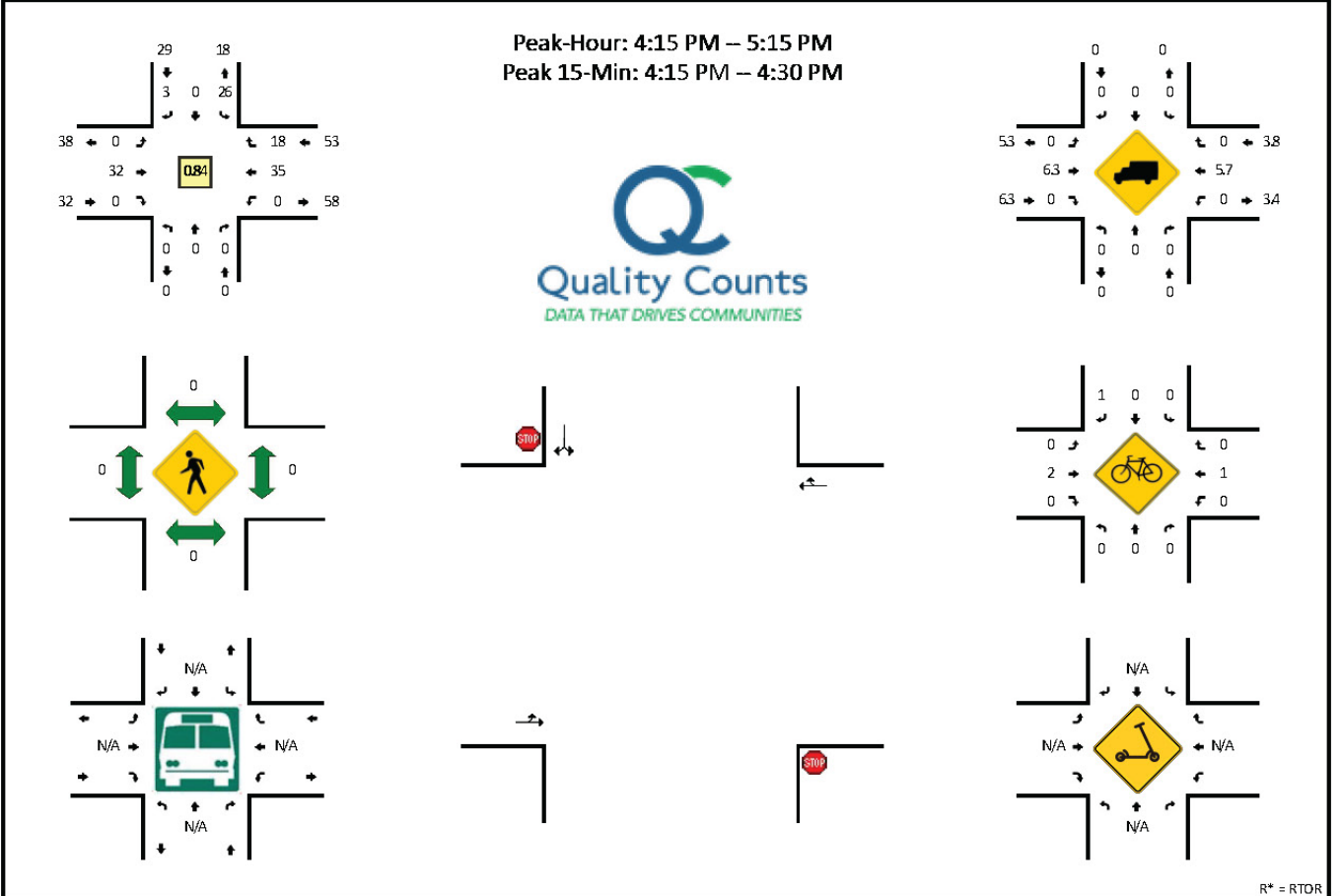
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: 7th St N -- 2nd Ave N
CITY/STATE: Naples, FL

QC JOB #: 16164306
DATE: Tue, Apr 18 2023



15-Min Count Period Beginning At	7th St N (Northbound)					7th St N (Southbound)					2nd Ave N (Eastbound)					2nd Ave N (Westbound)					Total	Hourly Totals
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*		
4:00 PM	0	0	0	0	0	4	0	3	0	0	0	10	0	0	0	0	10	2	0	0	29	
4:15 PM	0	0	0	0	0	5	0	0	0	0	0	11	0	0	0	0	12	6	0	0	34	
4:30 PM	0	0	0	0	0	3	0	0	0	0	0	4	0	0	0	0	9	5	0	0	21	
4:45 PM	0	0	0	0	0	7	0	2	0	0	0	12	0	0	0	0	3	2	0	0	26	110
5:00 PM	0	0	0	0	0	11	0	1	0	0	0	5	0	0	0	0	11	5	0	0	33	114
5:15 PM	0	0	0	0	0	4	0	0	0	0	0	6	0	0	0	0	8	5	0	0	23	103
5:30 PM	0	0	0	0	0	8	0	1	0	0	1	4	0	0	0	0	4	5	0	0	23	105
5:45 PM	0	0	0	0	0	3	0	0	0	0	1	4	0	0	0	0	4	3	0	0	15	94
Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound					Total	
All Vehicles	0	0	0	0	0	20	0	0	0	0	0	44	0	0	0	0	48	24	0	0		136
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	8	0	0	0	12	
Buses																						
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	
Scooters																						

Comments:

Report generated on 5/3/2023 10:07 AM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Appendix D:
Projected Traffic at Subject Intersections

2022 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
 CATEGORY: 0300 COLLIER COUNTYWIDE

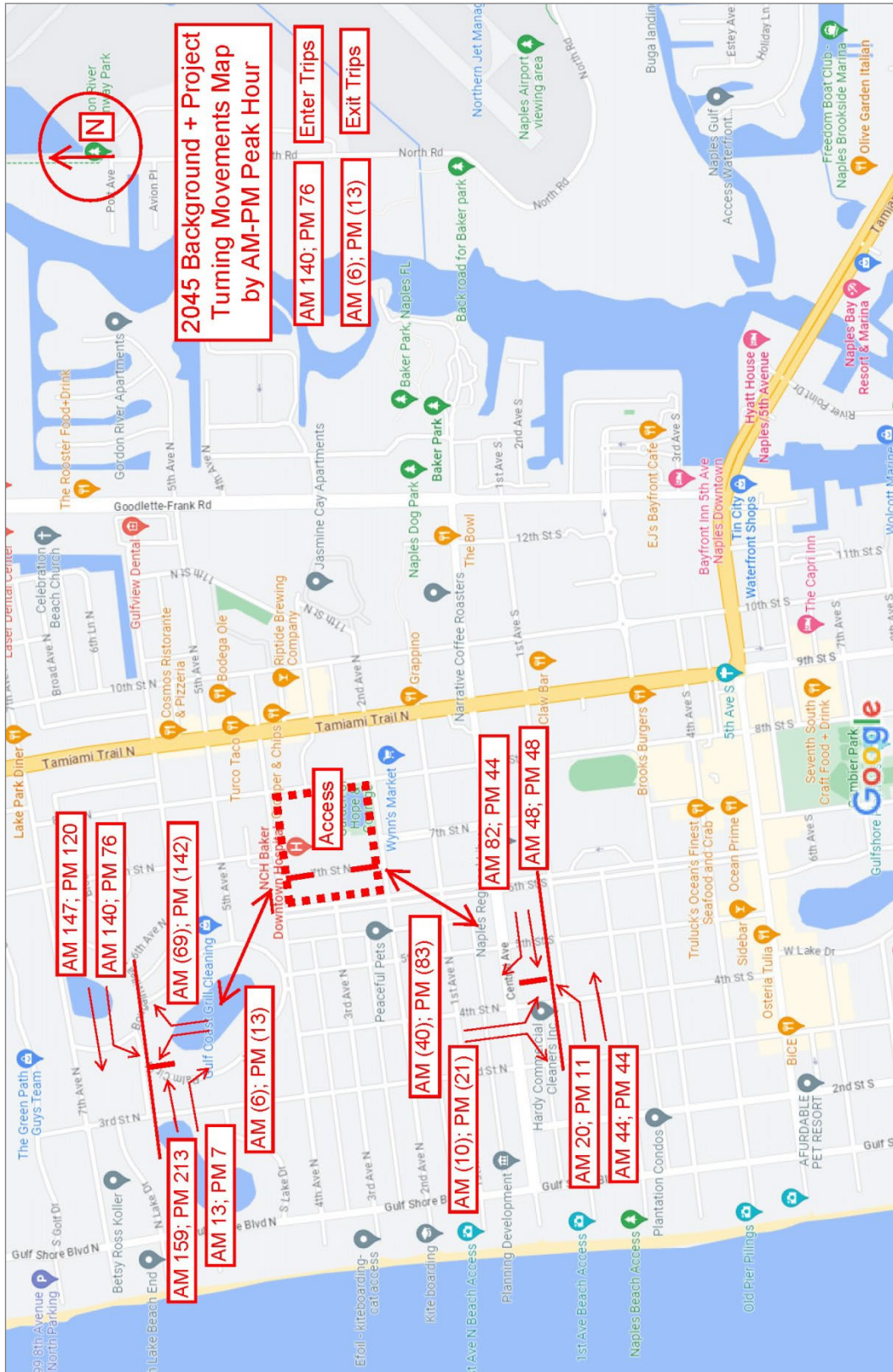
WEEK	DATES	SF	MOCF: 0.90 PSCF
1	01/01/2022 - 01/01/2022	0.97	1.08
2	01/02/2022 - 01/08/2022	0.97	1.08
3	01/09/2022 - 01/15/2022	0.98	1.09
4	01/16/2022 - 01/22/2022	0.96	1.07
* 5	01/23/2022 - 01/29/2022	0.94	1.04
* 6	01/30/2022 - 02/05/2022	0.92	1.02
* 7	02/06/2022 - 02/12/2022	0.90	1.00
* 8	02/13/2022 - 02/19/2022	0.88	0.98
* 9	02/20/2022 - 02/26/2022	0.87	0.97
*10	02/27/2022 - 03/05/2022	0.87	0.97
*11	03/06/2022 - 03/12/2022	0.87	0.97
*12	03/13/2022 - 03/19/2022	0.87	0.97
*13	03/20/2022 - 03/26/2022	0.89	0.99
*14	03/27/2022 - 04/02/2022	0.91	1.01
*15	04/03/2022 - 04/09/2022	0.92	1.02
*16	04/10/2022 - 04/16/2022	0.94	1.04
*17	04/17/2022 - 04/23/2022	0.96	1.07
18	04/24/2022 - 04/30/2022	0.98	1.09
19	05/01/2022 - 05/07/2022	1.00	1.11
20	05/08/2022 - 05/14/2022	1.02	1.13
21	05/15/2022 - 05/21/2022	1.04	1.16
22	05/22/2022 - 05/28/2022	1.05	1.17
23	05/29/2022 - 06/04/2022	1.07	1.19
24	06/05/2022 - 06/11/2022	1.08	1.20
25	06/12/2022 - 06/18/2022	1.10	1.22
26	06/19/2022 - 06/25/2022	1.08	1.20
27	06/26/2022 - 07/02/2022	1.07	1.19
28	07/03/2022 - 07/09/2022	1.05	1.17
29	07/10/2022 - 07/16/2022	1.04	1.16
30	07/17/2022 - 07/23/2022	1.04	1.16
31	07/24/2022 - 07/30/2022	1.04	1.16
32	07/31/2022 - 08/06/2022	1.04	1.16
33	08/07/2022 - 08/13/2022	1.04	1.16
34	08/14/2022 - 08/20/2022	1.04	1.16
35	08/21/2022 - 08/27/2022	1.06	1.18
36	08/28/2022 - 09/03/2022	1.08	1.20
37	09/04/2022 - 09/10/2022	1.10	1.22
38	09/11/2022 - 09/17/2022	1.12	1.24
39	09/18/2022 - 09/24/2022	1.11	1.23
40	09/25/2022 - 10/01/2022	1.10	1.22
41	10/02/2022 - 10/08/2022	1.09	1.21
42	10/09/2022 - 10/15/2022	1.08	1.20
43	10/16/2022 - 10/22/2022	1.06	1.18
44	10/23/2022 - 10/29/2022	1.05	1.17
45	10/30/2022 - 11/05/2022	1.03	1.14
46	11/06/2022 - 11/12/2022	1.01	1.12
47	11/13/2022 - 11/19/2022	1.00	1.11
48	11/20/2022 - 11/26/2022	0.99	1.10
49	11/27/2022 - 12/03/2022	0.98	1.09
50	12/04/2022 - 12/10/2022	0.97	1.08
51	12/11/2022 - 12/17/2022	0.97	1.08
52	12/18/2022 - 12/24/2022	0.97	1.08
53	12/25/2022 - 12/31/2022	0.98	1.09

* PEAK SEASON

23-FEB-2023 09:11:17

830UPD

1_0300_PKSEASON.TXT



TURNING MOVEMENTS
 INTERSECTION - 4th Ave N-7th St N
 COUNT DATA - DATE - Apr 18 2023
 COUNT DATA - TIME - 7.00 AM - 9.00 AM
 PEAK HOUR -08.00 AM - 9.00 AM

AM PEAK HOUR FUTURE TRAFFIC												
	4th Ave N								7th St N			
	WESTBOUND				EASTBOUND				NORTHBOUND			
	LEFT	THRU	RIGHT	TOTAL	LEFT	THRU	RIGHT	TOTAL	LEFT	THRU	RIGHT	TOTAL
2023 RAW COUNT	0	110	0	110	0	118	0	118	0	0	0	0
PEAK SEASON CONVERSION FACTOR	1.07	1.07	1.07		1.07	1.07	1.07		1.07	1.07	1.07	
2023 BACKGROUND	0	118	0	118	0	127	0	127	0	0	0	0
GROWTH RATE	1.00%	1.00%	1.00%		1.00%	1.00%	1.00%		1.00%	1.00%	1.00%	
YEARS TO BUILD-OUT	22	22	22		22	22	22		22	22	22	
2045 BACKGROUND	0	147	0	147	0	159	0	159	0	0	0	0
PROJECT TRAFFIC	140	0	0	140	0	0	13	13	6	0	69	75
2045 BACKGROUND + PROJECT TRAFFIC	140	147	0	287	0	159	13	172	6	0	69	75

TURNING MOVEMENTS
 INTERSECTION - 4th Ave N-7th St N
 COUNT DATA - DATE - Apr 18 2023
 COUNT DATA - TIME - 4.00 PM - 6.00 PM
 PEAK HOUR -04.00 PM - 05.00 PM

PM PEAK HOUR FUTURE TRAFFIC												
	4th Ave N								7th St N			
	WESTBOUND				EASTBOUND				NORTHBOUND			
	LEFT	THRU	RIGHT	TOTAL	LEFT	THRU	RIGHT	TOTAL	LEFT	THRU	RIGHT	TOTAL
2023 RAW COUNT	0	89	0	89	0	159	0	159	0	0	0	0
PEAK SEASON CONVERSION FACTOR	1.07	1.07	1.07		1.07	1.07	1.07		1.07	1.07	1.07	
2023 BACKGROUND	0	96	0	96	0	171	0	171	0	0	0	0
GROWTH RATE	1.00%	1.00%	1.00%		1.00%	1.00%	1.00%		1.00%	1.00%	1.00%	
YEARS TO BUILD-OUT	22	22	22		22	22	22		22	22	22	
2045 BACKGROUND	0	120	0	120	0	213	0	213	0	0	0	0
PROJECT TRAFFIC	76	0	0	76	0	0	7	7	13	0	142	155
2045 BACKGROUND + PROJECT TRAFFIC	76	120	0	196	0	213	7	220	13	0	142	155

TURNING MOVEMENTS
 INTERSECTION - 2nd Ave N-7th St N
 COUNT DATA - DATE - Apr 18 2023
 COUNT DATA - TIME - 7.00 AM - 9.00 AM
 PEAK HOUR -08.00 AM - 09.00 AM

AM PEAK HOUR FUTURE TRAFFIC												
	2nd Ave N								7th St N			
	WESTBOUND				EASTBOUND				SOUTHBOUND			
	LEFT	THRU	RIGHT	TOTAL	LEFT	THRU	RIGHT	TOTAL	LEFT	THRU	RIGHT	TOTAL
2023 RAW COUNT	0	35	0	35	0	32	0	32	0	0	0	0
PEAK SEASON CONVERSION FACTOR	1.07	1.07	1.07		1.07	1.07	1.07		1.07	1.07	1.07	
2023 BACKGROUND	0	38	0	38	0	35	0	35	0	0	0	0
GROWTH RATE	1.00%	1.00%	1.00%		1.00%	1.00%	1.00%		1.00%	1.00%	1.00%	
YEARS TO BUILD-OUT	22	22	22		22	22	22		22	22	22	
2045 BACKGROUND	0	48	0	48	0	44	0	44	0	0	0	0
PROJECT TRAFFIC	0	0	82	82	20	0	0	20	40	0	10	50
2045 BACKGROUND + PROJECT TRAFFIC	0	48	82	130	20	44	0	64	40	0	10	50

TURNING MOVEMENTS
 INTERSECTION - 2nd Ave N-7th St N
 COUNT DATA - DATE - Apr 18 2023
 COUNT DATA - TIME - 4.00 PM - 6.00 PM
 PEAK HOUR - 04.15 PM - 05.15 PM

PM PEAK HOUR FUTURE TRAFFIC												
	2nd Ave N								7th St N			
	WESTBOUND				EASTBOUND				SOUTHBOUND			
	LEFT	THRU	RIGHT	TOTAL	LEFT	THRU	RIGHT	TOTAL	LEFT	THRU	RIGHT	TOTAL
2023 RAW COUNT	0	35	0	35	0	32	0	32	0	0	0	0
PEAK SEASON CONVERSION FACTOR	1.07	1.07	1.07		1.07	1.07	1.07		1.07	1.07	1.07	
2023 BACKGROUND	0	38	0	38	0	35	0	35	0	0	0	0
GROWTH RATE	1.00%	1.00%	1.00%		1.00%	1.00%	1.00%		1.00%	1.00%	1.00%	
YEARS TO BUILD-OUT	22	22	22		22	22	22		22	22	22	
2045 BACKGROUND	0	48	0	48	0	44	0	44	0	0	0	0
PROJECT TRAFFIC	0	0	44	44	11	0	0	11	83	0	21	104
2045 BACKGROUND + PROJECT TRAFFIC	0	48	44	92	11	44	0	55	83	0	21	104

Appendix E:

Intersection Analyses – Synchro Reports

HCM 6th TWSC
9: 7th St N & 4th Ave N

11/22/2023

Intersection

Int Delay, s/veh 3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑	↑	↑
Traffic Vol, veh/h	159	13	140	147	6	69
Future Vol, veh/h	159	13	140	147	6	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	11	2	2
Mvmt Flow	173	14	152	160	7	75

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	187	0	644
Stage 1	-	-	-	-	180
Stage 2	-	-	-	-	464
Critical Hdwy	-	-	4.13	-	6.63
Critical Hdwy Stg 1	-	-	-	-	5.83
Critical Hdwy Stg 2	-	-	-	-	5.43
Follow-up Hdwy	-	-	2.219	-	3.519
Pot Cap-1 Maneuver	-	-	1386	-	421
Stage 1	-	-	-	-	834
Stage 2	-	-	-	-	632
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1386	-	375
Mov Cap-2 Maneuver	-	-	-	-	375
Stage 1	-	-	-	-	834
Stage 2	-	-	-	-	562

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	843	-	-	1386	-
HCM Lane V/C Ratio	0.097	-	-	0.11	-
HCM Control Delay (s)	9.7	-	-	7.9	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.4	-

HCM 6th TWSC
9: 7th St N & 4th Ave N

11/22/2023

Intersection						
Int Delay, s/veh	3.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑	↑	↑
Traffic Vol, veh/h	213	7	76	120	13	142
Future Vol, veh/h	213	7	76	120	13	142
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	2	2	2	2	2
Mvmt Flow	232	8	83	130	14	154
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	240	0	532	120
Stage 1	-	-	-	-	236	-
Stage 2	-	-	-	-	296	-
Critical Hdwy	-	-	4.13	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1325	-	493	909
Stage 1	-	-	-	-	782	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1325	-	462	909
Mov Cap-2 Maneuver	-	-	-	-	462	-
Stage 1	-	-	-	-	782	-
Stage 2	-	-	-	-	706	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	3.1		10.4		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	841	-	-	1325	-	
HCM Lane V/C Ratio	0.2	-	-	0.062	-	
HCM Control Delay (s)	10.4	-	-	7.9	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.7	-	-	0.2	-	

HCM 6th TWSC
10: 2nd Ave N & 7th St N

11/22/2023

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↑	↗	↘	
Traffic Vol, veh/h	20	44	48	82	40	10
Future Vol, veh/h	20	44	48	82	40	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	120	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	3	3	2	2	2
Mvmt Flow	22	48	52	89	43	11
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	141	0	-	0	144	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	92	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1442	-	-	-	849	1016
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	932	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1442	-	-	-	835	1016
Mov Cap-2 Maneuver	-	-	-	-	835	-
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	932	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.4	0		9.4		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1442	-	-	-	866	
HCM Lane V/C Ratio	0.015	-	-	-	0.063	
HCM Control Delay (s)	7.5	0	-	-	9.4	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

HCM 6th TWSC
10: 2nd Ave N & 7th St N

11/22/2023

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↑	↗	↘	
Traffic Vol, veh/h	11	44	48	44	83	21
Future Vol, veh/h	11	44	48	44	83	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	120	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	6	6	2	2	2
Mvmt Flow	12	48	52	48	90	23
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	100	0	-	0	124	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	72	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1493	-	-	-	871	1016
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	951	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1493	-	-	-	864	1016
Mov Cap-2 Maneuver	-	-	-	-	864	-
Stage 1	-	-	-	-	962	-
Stage 2	-	-	-	-	951	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.5	0		9.6		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1493	-	-	-	891	
HCM Lane V/C Ratio	0.008	-	-	-	0.127	
HCM Control Delay (s)	7.4	0	-	-	9.6	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	