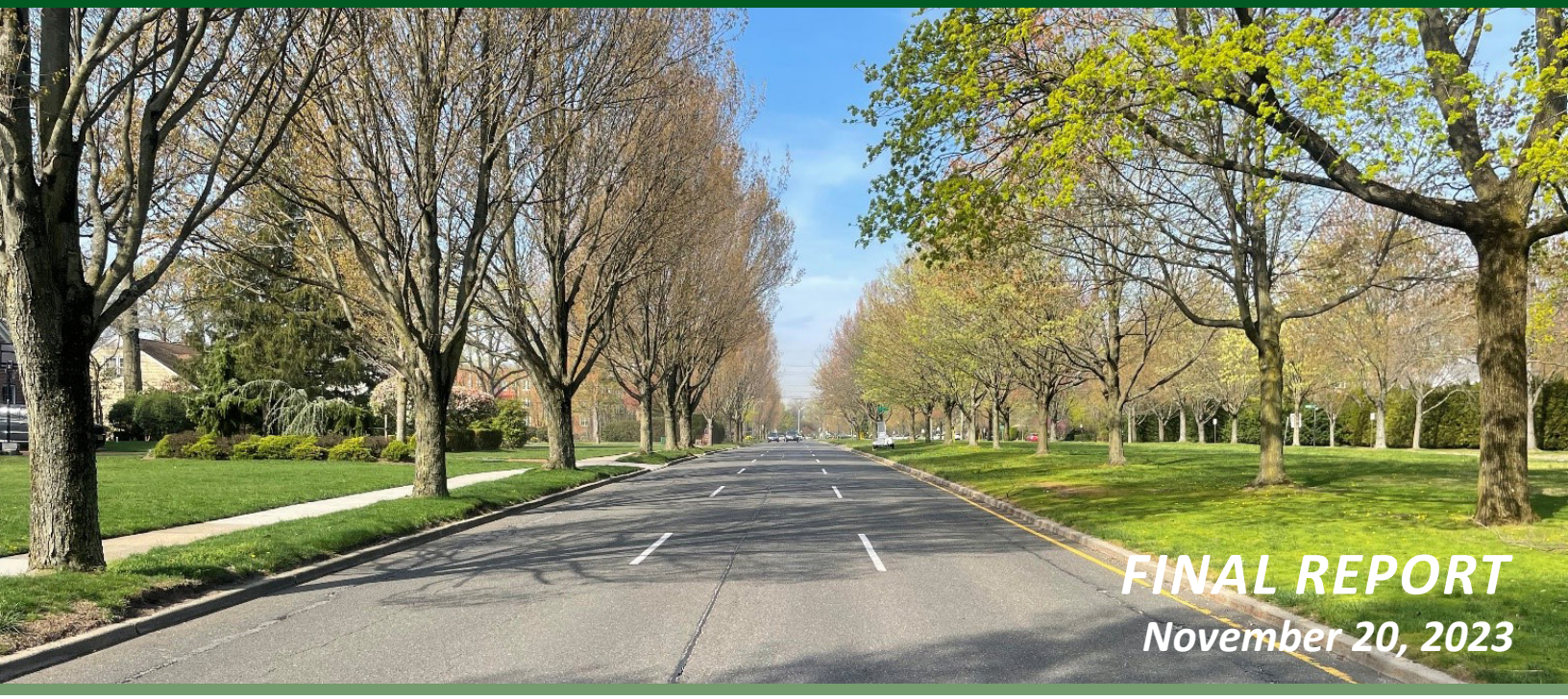
VILLAGE OF GARDEN CITY

FINAL STEWART AVENUE ROAD DIET TRAFFIC STUDY



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EXECUTIVE SUMMARY

In its ongoing pursuit to improve transportation, the Village of Garden City took the opportunity presented by a scheduled resurfacing project of the Village-owned segment of Stewart Avenue to evaluate the implementation of a Complete Streets approach known as a Road Diet between Franklin Avenue and Clinton Road. Creighton Manning Engineering, LLP (CM), on behalf of the Village of Garden City, commenced a study in May 2023 to evaluate the feasibility of implementing a road diet along this portion of the roadway. A road diet reduces the number of travel lanes and the effective width of the roadway by re-striping the pavement surface. The reallocation of space can result in improved safety for pedestrians by reducing the potential vehicle conflicts; for cyclists by providing dedicated space on the roadway; and for vehicles by providing clear delineation, exclusive left-turn and right-turn lanes at intersections, and fewer overall conflict points.

The goals of the study were to provide an assessment of the feasibility, benefits, and impacts of a road diet in the corridor involving the reduction of travel lanes in each direction from three to two and the reallocation of pavement for on-street parking and turn-lanes at key intersections.

The analysis herein evaluated a full road diet of the study corridor and a partial road diet. The analysis shows that the implementation of a road diet on eastbound Stewart Avenue beginning east of Franklin Avenue and opening back up to three east of Butler Place until Clinton Road will provide back capacity to the corridor. On westbound Stewart Avenue, the road diet will begin west of Clinton Road and maintain two travel lanes until Franklin Avenue. The table below shows the tradeoffs with this new lane configuration:

Potential Advantages	Potential Disadvantages
Crash rate and crash severity reductions	Increase in corridor travel times
Improved pedestrian and bicyclist comfort	Increased traffic diversion
Reduced travel speeds	Increased road accessibility conflicts at unsignalized intersections
Opportunities for streetscapes or bike lanes	
Exclusive left-turn and right-turn lanes	
Community character and quality-of-life enhancements	

A municipality's decision to support a road diet involves an understanding of the trade-offs. Creighton Manning has advised Garden City Police Commissioner, Kenneth Jackson, and the Village Department of Public Work Superintendent, John Borroni, of the potential advantages and disadvantages of a road diet on Stewart Avenue in the progress meeting on August 30, 2023. Generally, road diets do not reduce corridor travel times since one of their goals is to reduce travel speeds. However, the reduction in travel speeds is not intended to result in congestion rather in a more balanced and comfortable environment for all road users, including drivers. Compared to other infrastructure projects, road diets are a cost-effective solution to traffic calming and often can be completed through a restriping of the existing pavement surface. However, they also allow for greater investment in Complete Streets initiatives in the form of streetscapes and bike lanes if desired.

CHAPTER 1. INTRODUCTION

In May 2023, the Village of Garden City authorized Creighton Manning Engineering, LLP (CM) to evaluate the feasibility of implementing a Complete Streets approach known as a road diet along the Village owned segment of Stewart Avenue between Franklin Avenue and Clinton Road. The number of lanes on a roadway directly increases the number of potential conflict points and difficulty for all road users – drivers, pedestrians, and cyclists – to navigate the roadway. A road diet is a traffic calming method that reduces the number of travel lanes on a roadway without altering the existing hardscape. The Village is currently pursuing this type of improvement on Cathedral Avenue as part of its ongoing pursuit to improve to safety for the traveling public. The goal of this study is to assess the feasibility, benefits, and impacts of a road diet in the corridor by evaluating alternatives that consider a more balanced approach to transportation. There were also various ancillary goals and requirements that were part of the study including: (i) define on-street parking on the south side of Stewart Avenue near Franklin; (ii) there is to be no alteration to the existing landscaped median; (iii) there were to be no alterations that would require input from the Nassau County Department of Public Work (i.e. signal timing adjustments, signal equipment modifications, etc.). travel alignment to avoid changes to traffic signal infrastructure owned by the County. Exhibit 1.1 illustrates the study area, which includes the following intersections (listed from west to east):

Intersection	Control*
• Stewart Ave/Franklin Ave	S
• Stewart Ave/Arthur St	U
• Stewart Ave/John St	U
• Stewart Ave/Washington Ave	S
• Stewart Ave/Butler Pl/Westbury Rd	U
• Stewart Ave/Emmet Pl/Wetherill Rd	U
• Stewart Ave/Clinton Rd/Osborne Rd	S

*S/U= Signalized/Unsignalized

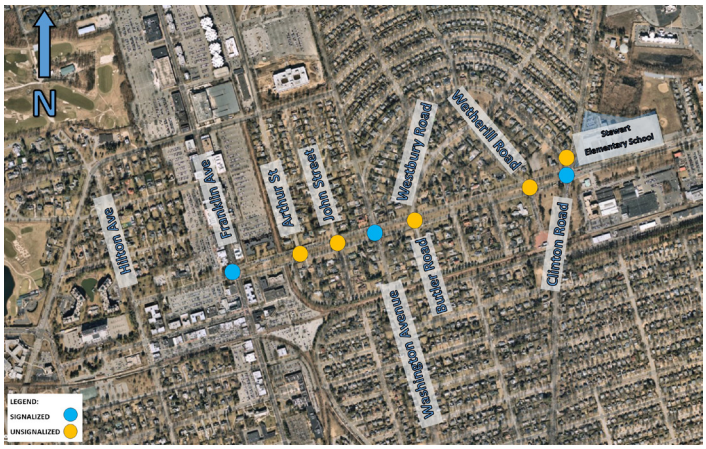


Exhibit 1.1 - Study Area Intersections

Stewart Avenue is an Urban Minor Arterial roadway. Between Franklin Avenue and Clinton Road, the roadway is under the jurisdiction of the Village of Garden City. The Village confirmed the scope of this study. This is a Village-sponsored study and CM consulted with the Village throughout the study process. The Village will need to review, approve, and oversee any changes to Stewart Avenue that result from this study.

The U.S Department of Transportation Federal Highway Administration (FHWA) states that the primary benefits of a road diet include "enhanced safety, mobility, and access for all road users and a 'complete streets' environment to accommodate a variety of transportation modes." The FHWA provides information about road diets, and notes that the typical road diets involve the reallocation of pavement from four travel lanes (two in each direction) to one travel lane in each direction with a center two-way left-turn lane (TWLTL), as shown in Exhibit 1.2 from the FHWA website. In the case of Stewart Avenue, the roadway currently provides three travel lanes in each direction with a wide landscaped median separating the eastbound and westbound lanes. Therefore, the study herein evaluated a scenario where the travel lanes are reduced from three to two.

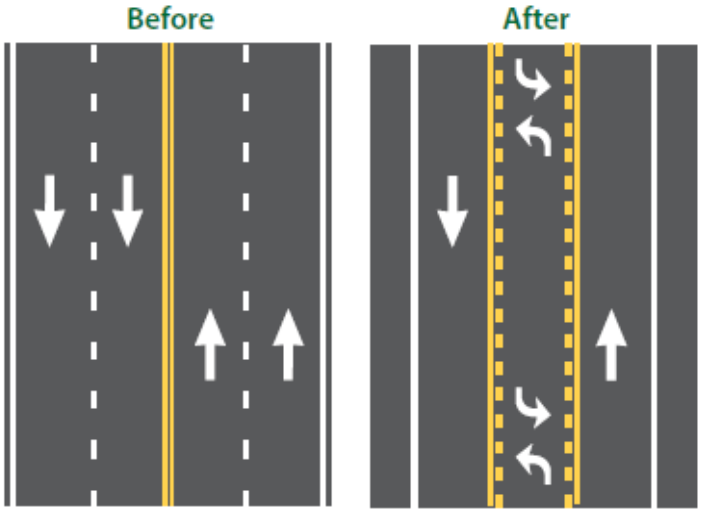


Exhibit 1.2 - Visualization of Road Diet Configuration

The reallocation of space can result in improved safety for pedestrians by reducing crossing distances and the potential vehicle conflicts; for cyclists by providing dedicated shoulder areas or striped bike lanes; and for vehicles by providing clear delineation, exclusive left-turn and right-turn lanes at intersections, and fewer overall conflict points. Within the study corridor, there are a number of potential benefits associated with the potential implementation of a road diet. Below are several identified benefits detailed in works published by the American Association of State Highway and Transportation Officials (AASHTO) and the FHWA. [1,2]

- Fewer lanes for pedestrians to cross.
- Left-turn and right-turn lanes provide a place for motorists and bicyclists to wait to make a turn, reducing the incidence of left-turn and rear-end crashes.
- Less traffic noise (due to reduced speeds) and greater separation from traffic for pedestrians, residents, and businesses.

The AASHTO and FHWA guides do not list disadvantages; however, there are several perceived or anecdotal concerns as listed below:

- Reducing capacity will increase vehicle delays and travel time.
- Reducing capacity results in fewer gaps on the main line thus increasing the difficulty for vehicles turning to and from side streets and driveways.
- Reducing capacity will result in cut-through traffic.
- In some cases, a reduction of lanes miles may result in less governmental funding.

The previous discussion shows that there are a number of trade-offs associated with the implementation of a road diet. For example, reducing capacity may provide a traffic calming effect but could increase delays for traffic turning onto Stewart Avenue due to fewer gaps in the stream of traffic. All potential benefits and concerns should be weighed in assessing the feasibility and practicality of a road diet.

In addition to the above concerns, several criteria have been identified as success factors for feasibility of the road diet. These include:

[1] American Association of State Highway and Transportation Officials. *Guide for the Development of Bicycle Facilities 2012, 4th Edition,* 2012.

[2] US Department of Transportation Federal Highway Administration. "Road Diets." *Proven Safety Countermeasures,* October 18, 2017, https://safety.fhwa.dot.gov/provencountermeasures/road_diets/, Accessed June 9, 2021.

- Maintaining the existing curb lines. To be cost effective, feasible alternatives should fit mostly within the existing roadway width and avoid significant roadway reconstruction cost. Implementation could occur largely through restriping with some limited curb work.
- Allowing sufficient opportunities for turning vehicles to enter and exit mainline traffic without unduly interrupting mainline flow. Generally speaking, this criterion dictates the necessity for queuing space for turning vehicles that will not interrupt mainline flow.
- Zero encroachment into the existing median that provides streetscaping to the corridor.
- Striving to provide on-street parking along the southern curb line of the eastbound segment between Franklin Avenue and St. James Street.
- Striving to provide standard lane widths.

CHAPTER 2. EXISTING CONDITIONS

A. Corridor Conditions

Stewart Avenue is an Urban Minor Arterial roadway. The roadway runs east-west for approximately three miles from Merrick Avenue in the Town of Hempstead to Hilton Avenue in the Village of Garden City. The section of the roadway considered in this study, which falls between Franklin Avenue and Clinton Road, is under the jurisdiction of the Village of Garden City. This section generally provides two 30-foot-wide roadways consisting of three 10-foot-wide travel lanes separated by a 90-foot-wide median shown in Exhibit 2.1.

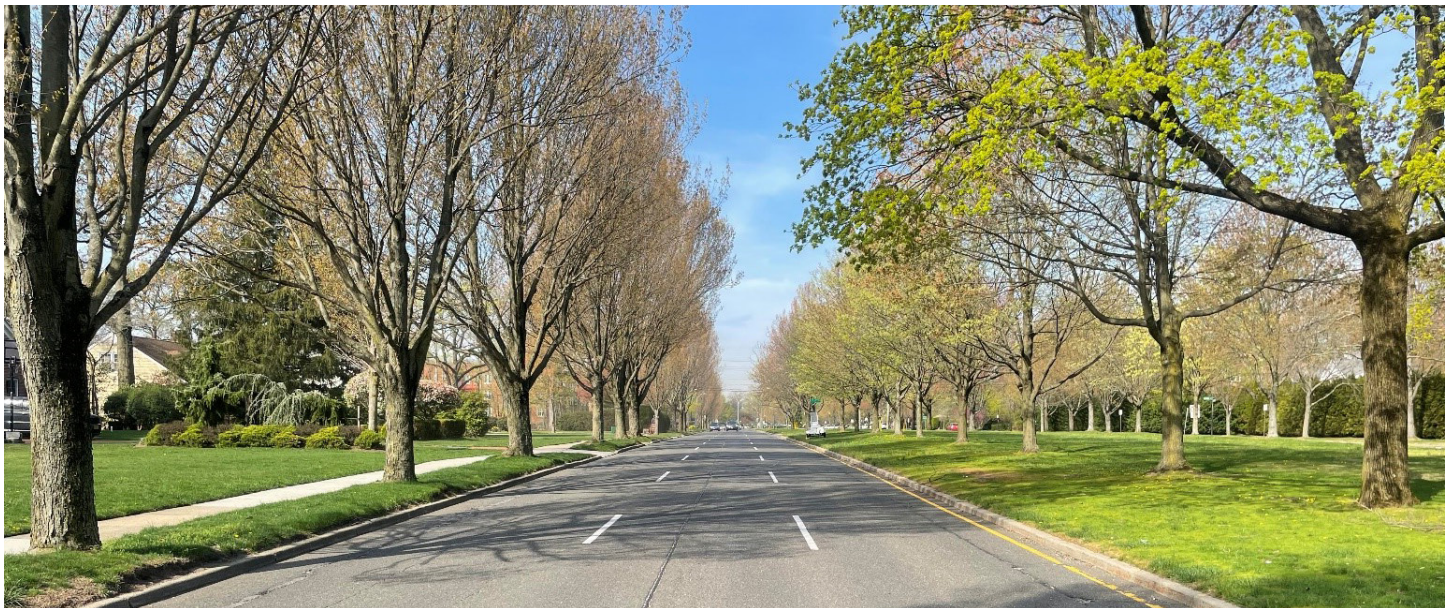


Exhibit 2.1 –Existing Roadway Configuration (Stewart Avenue Eastbound Lanes Facing West)

The median divides the eastbound and westbound lanes forming independent intersections on either side of the median as shown in Exhibit 2.2.

Exhibit 2.2 – Typical Configuration of Mainline/Side Street Intersections along Corridor (Stewart Ave/Westbury Rd & Stewart Ave/Butler Pl Intersections)

Within the study area, there are no shoulders, and the only intersections with exclusive turn lanes are Franklin Avenue and Clinton Road. The posted speed limit is 30 miles per hour. There are five-foot-wide sidewalks with a variable-width buffer space provided along both sides of the roadway. Curbside parking is provided on the southern curb of the eastbound lanes between Franklin Avenue and St. James Street. West of Franklin Avenue, Stewart Avenue provides two travel lanes in each direction. Outside of the study area, Stewart Avenue provides two travel lanes in each direction west of Franklin Avenue and three travel lanes in each direction east of Clinton Road.

The primary land use in the immediate study area is single-family residential homes although there are some multifamily buildings near Franklin Avenue. The commercial area in the Village of Garden City is located on the west end of the study area on Franklin Avenue. Stewart Elementary School is located on the east end of the corridor on the northeast corner of Stewart Avenue/Clinton Road intersection. The Lutheran Church of Resurrection and Church in the Garden are located south and north sides of Stewart Avenue, respectively. The Garden City Fire Department Station 3 is located on the south end of Emmet Place, which has direct access to Stewart Avenue. There are no other commercial uses adjacent to the roadway.

1. Pedestrians

Concrete sidewalks that are generally five feet wide accommodate pedestrians on both sides of Stewart Avenue. Marked crosswalks are generally present at the study intersections, although some of the crosswalk markings are faded. Some of the intersections have pedestrian accommodations such as curb ramps, detectible warning surfaces, and pedestrian signals with countdown timers. Exhibit 2.3 shows the existing pedestrian accommodations at the signalized intersection of Stewart Avenue and Washington Avenue.

Exhibit 2.3 – Existing Pedestrian Accommodations (Stewart Avenue/Washington Avenue Facing Southeast)

2. Bicycles

There are no bicycle accommodations on Stewart Avenue. The 10-foot-wide travel lanes in each direction do not allocate space for bicyclists and there are no delineated shoulders. Data collection indicated that bicycle traffic was relatively low. Additionally, a review of the existing conditions along the study corridor identified that accommodations for cyclists, such as bicycle racks, are not present.

3. Transit

The Long Island Rail Road (LIRR) Garden City station on the Hempstead Line is located on the southeast corner of the Cathedral Avenue-7th Street intersection. The Nassau Inter-County Express (NICE) Route 15 traverses the study area along westbound Stewart Avenue; however, there are no stops located within the study area.

B. Motor Vehicle Crash History

A motor vehicle crash analysis was performed for the study corridor based on data provided by the New York State Department of Transportation (NYSDOT). The analysis included a review of 242 crashes over a three-year period from January 1, 2020 through December 31, 2022 between Franklin Avenue and Clinton Road. A detailed crash sheet summary and crash history are included under Appendix A. The data shows the following:

- Most crashes occurred during clear dry conditions suggesting that weather conditions and pavement conditions are not the primary contributing factors of the crash history.
- 56% of crashes in the corridor are of types potentially correctible by a road diet (26% overtaking, 14% rear end, and 16% right angle).
- There were zero fatal crashes reported in the three-year period.

Crashes involving property damage accounted for 68% of total crashes while crashes resulting in at least one injury comprised 32%. The percentage of crashes that resulted in at least one injury is well above the statewide average for crash severity, which is 25.10% for such a roadway.[3] Road diets have been identified by FHWA as Proven Safety Countermeasures for rear-end, sideswipe, right-angle, and pedestrian crash trends. The FHWA's Road Diet Informational Guide found that studies in suburban areas of large cities exhibited a 19-percent reduction in overall crashes when a Road Diet is installed on a previously four-lane undivided facility, as well as a decrease in crashes involving drivers under 35 years of age and over 65 years of age. The FHWA's 19-47% reduction range is meant to encompass a wide range of road diet applications. It should be noted that the proposed road diet configuration for Stewart Avenue differs from the configuration evaluated in these studies, but the elimination of a lane directly reduces the number of conflict points and reduces the effective crossing distance for pedestrians.[4] Given that the crash history and crash severity of Stewart Avenue exceed statewide averages, any steps to reduce the opportunity for crashes would be beneficial. When designed appropriately, a road diet provides a refuge area that allows the vehicle to no longer obstruct a through lane thus eliminating hazardous weaving maneuvers by drivers attempting to navigate around the turning vehicle.

C. Traffic Volumes

Historic traffic volume data published by the NYSDOT shows that daily traffic volumes along Stewart Avenue in 2019 totaled 26,169 vehicles per day (vpd) based on NYSDOT Automatic Traffic Recorder (ATR) Station ID 031517 located on Stewart Avenue 158 feet east of Arthur Street. [5]

[3] NYSDOT-Safety Information Management System – No. 61, https://www.dot.ny.gov/divisions/operating/osss/highway-repository/AccidentCost_SeverityDistribution2016.pdf
[4] Effective crossing distance is the distance that pedestrian are directly exposed to moving vehicles (i.e. from edge of travel to edge of travel, not curb to curb)
[5] NYSDOT Traffic Volume Data is included under Appendix D.

CM installed two ATRs along Stewart Avenue to capture 24-hour volumes, vehicle classifications, and speed data by direction from Saturday, May 20, 2023, to Friday, May 26, 2023. The ATRs were installed on the east and west side of Washington Avenue. The existing traffic data is included under Appendix B and summarized in Table 2.1.

Table 2.1 – Summary of ATR Data

	Stewart Avenue	
	Between John Street & Washington Avenue	Between Washington Avenue & Westbury Road/Butler Place
Volume		
AWDT (vpd)	27,845	28,154
DHV (vph)	2,420	2,447
K	8.7%	8.7%
DDHV (vph)	1,221	1,316
Speed (mph)		
15th-Percentile EB	14	27
15th-Percentile WB	27	17
50th-Percentile EB	22	32
50th-Percentile WB	32	26
Average EB	23	32
Average WB	32	26
85th-Percentile EB	34	38
85th-Percentile WB	38	37
95th-Percentile EB	39	41
95th-Percentile WB	42	42

AWDT = Average Weekday Daily Traffic
DHV = Design Hour Volume
K = Peak hour traffic as a percent of daily traffic volumes
DDHV = Directional Design Hour Volume

The data shows that the average weekday daily traffic volume on Stewart Avenue is approximately 28,100 vehicles per day. While the traffic volumes are close in the eastbound and westbound direction in the AM peak hour, during the PM peak hour the eastbound lanes experience higher volumes during this period. The 85th-percentile speeds are between 34 and 38 miles per hour. The 85th-percentile speed is the speed at or below which 85 percent of motorists travel. It is important to note that excessive speeding is considered by the FHWA as 20 percent above the posted speed limit, which on Stewart Avenue is 30-mph; the observed 85th-percentile speeds are 23 percent above the posted speed limit.[6]

Intersection turning movement counts were conducted on Wednesday, May 24, 2023, from 7:00 AM to 9:00 AM and from 2:00 PM to 7:00PM. These periods capture the peak commuter periods in the morning and evening as well as the arrival and dismissal periods of the proximate Stewart Elementary School. These counts were conducted at the seven study intersections listed in Chapter 1. Introduction. Upon review of the count data, it was determined that the corridor peak hours were:

- Weekday AM Peak Hour | 8:00 AM to 9:00 AM
- Weekday Midday Peak Hour | 3:00 PM to 4:00 PM
- Weekday PM Peak Hour | 4:45 PM to 5:45 PM

It is important to note that the Novel Coronavirus/COVID-19 pandemic was anticipated to have an effect on the turning movement counts. CM cited historical data published by the NYSDOT on the Traffic Data Viewer to compare the observed counts at various locations. The comparison showed that the observed midday and PM volumes were equal and higher than

[6] US Department of Transportation Federal Highway Administration. "Road Diet Information Guide." November 24, 2014 https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/ch3.cfm#n27, Accessed June 9, 2021.
[7] NYSDOT ATR Station ID 034352 | 038407 | 031517 |
[8] AM Calibration Factor = 1.03

the historical data. For the AM period, the comparison showed that the volumes were lower than historical data. A calibration factor was calculated and applied to the AM volumes to develop "pre-pandemic" traffic volumes. Figures 1A- 1C show the 2023 Existing traffic volumes for the study area for the weekday AM, midday, and PM peak hours. The raw intersection turning movement counts are included under Appendix C.

D. Operations

Intersection capacity analysis was completed using Synchro 11 software to identify existing vehicle operations and levels of service through the study corridor. The analysis was also used to provide a base condition to compare the null condition, which is the condition where no changes are made to the roadway, and the road diet alternative. Table 2.2 summarizes the existing levels of service during the weekday AM, Midday and PM peak hour conditions.

Table 2.2 – Existing Overall Level of Service

Intersection		Control[1]	AM Peak Hour	Midday Peak Hour	PM Peak Hour
1	Franklin Ave	S	E (65.8)	D (35.9)	D (51.9)
2	Arthur St North	U	C (20.0)	C (21.5)	D (25.9)
3	Arthur St South	U	B (12.4)	B (12.6)	B (13.2)
4	John St North	U	C (18.8)	C (18.7)	D (33.6)
5	John St South	U	D (27.6)	E (38.9)	F (50.6)
6	Washington Ave North	S	D (40.9)	C (28.8)	D (53.2)
7	Washington Ave South	S	D (51.3)	D (35.2)	D (52.4)
8	Westbury Rd/Butler Pl North	U	E (35.9)	D (25.3)	F (110.5)
9	Westbury Rd/Butler Pl South	U	C (24.4)	F (57.8)	F (65.5)
10	Wetherill Rd/Emmet Pl North	U	E (43.8)	D (25.2)	F (147.0)
11	Wetherill Rd/Emmet Pl South	U	D (34.2)	E (41.8)	F (131.2)
12	Clinton Rd	S	F (81.2)	F (86.0)	F (84.5)
13	Clinton Rd/Osborne Rd	S[2]	B (10.4)	B (10.3)	B (10.9)

X (Y.Y) = Level of Service (Average delay in seconds per vehicle)
[1]Control: S = Signalized | U = Unsignalized | LOS for signalized intersections reflects overall | LOS for unsignalized intersection reflects the highest side street stop-controlled delay.
[2]Osborne Road is stop controlled with a flashing red signal only when northbound and southbound Clinton Road approach gets green ball. No right-on red allowed.

The analysis shows that the majority of the signalized study intersections currently operate at level of service (LOS) D, E, and F depending on the time period. The PM peak hour being the time period with the highest delays for most intersections.

Travel times were obtained from the Synchro 11 software simulations. These simulated travel times were then compared to travel time runs conducted in the field using the "floating car" method on Thursday, June 8, 2023. Table 2.3 summarizes the comparison of the simulated travel times and field-measured travel time runs for a vehicle traveling the length of the corridor from Franklin Avenue to Clinton Road during each study period peak period according to direction of travel.

Table 2.3 – Existing Conditions Simulated Travel Times (Minutes:Seconds)

Direction	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
	Sim	FIeld	Sim	Field	Sim	Field
Eastbound	3:35	2:09	4:20	2:58	4:37	3:31
Westbound	3:07	2:15	2:24	2:17	3:45	2:34

Table 2.3 shows that the simulated travel times are higher than the field measured travel times. This is partially due to the difference in travel speed between the Synchro simulation and the actual travel speeds on the road during the field measured travel times. The detailed level of service reports are included under Appendix D.

Queue lengths were also obtained from the Synchro 11 software simulations for the eastbound and westbound Stewart Avenue approaches at all signalized intersections. Table 2.4 summarizes the 95th-percentile queue length by lane of each approach.

Table 2.4 – Existing Condition Simulated 95th-percentile Queue Lengths (Feet)

Intersection		Lane	AM Peak Hour	Midday Peak Hour	PM Peak Hour
1	Franklin Ave				
	Stewart Avenue EB	LTR	331	356	370
	Stewart Avenue WB	L	329	226	294
		T	160	175	270
		R	84	44	59
6/7	Washington Ave				
	Stewart Avenue EB	LTR	339	475	545
	Stewart Avenue WB	LTR	369	321	426
12	Clinton Road				
	Stewart Avenue EB	L	334	341	295
		TR	308	441	496
	Stewart Avenue WB	L	130	320	319
		TR	695	537	728

Table 2.4 indicates that the longest queuing occurred during the PM peak hours at the signalized intersections. Some of the queuing encroached on upstream intersections during this study hour.

CHAPTER 3. ANALYSIS & FINDINGS

A. Future Traffic Volumes

To evaluate the proposed road diet, traffic projections were prepared for ten years after the estimated time of completion (ETC+10) – 2033. The New York Metropolitan Transportation Council (NYMTC) published the New York Best Practice Model which states that a Functional Classification 16 Roadway (i.e., Urban Minor Arterial) in Nassau County, such as Stewart Avenue, should expect a growth rate of +0.49% per year for the period from 2020 to 2045. Therefore, a 0.50% per year growth rate was applied to the 2023 existing traffic volumes and compounded annually for ten years. CM also investigated traffic growth associated with the proposed Sands Casino redevelopment of Nassau Coliseum. At the time of CM conducted this study, CM was informed by Town of Hempstead and the Nassau County Department of Public Works (NCDPW) that there were no traffic studies for the proposed redevelopment. The most impactful traffic volumes associated with that redevelopment are likely to fall outside of the evaluated periods for this study since casinos typically peak on Friday evenings and weekend days/evenings. The forecasted 2033 ETC+10 traffic volumes are shown on Figures 2A – 2C.

B. General Discussion

It is important to consider the many factors and constraints that the road diet analysis had for this study. The Village owned Stewart Avenue corridor is bound by two County owned arterial roadways, Franklin Avenue and Clinton Road. The signals at these intersections meter the input and output of vehicles along the studied roadway. A key parameter of the study was to avoid making any changes to the signal timings and/or signal infrastructure along the study corridor so that the NCDPW did not need to be engaged for approval of the changes. Consequently, maintaining the signal timings and infrastructure, eliminates a “tool from the tool box” that would be used to address delays brought about by the proposed road diet in the future conditions. It can be assumed that at some point the County will improve the signal operations as volumes change, but for this analysis CM did adhered to the aforementioned parameter and did not make any adjustments to signal timings or the signal infrastructure.

C. Full Road Diet

CM conducted an analysis of a full road diet along the study corridor. In this scenario, the roadway travel lanes are reduced from three to two along the entire section of Stewart Avenue between Franklin Avenue and Clinton Road. In order to maintain proper alignment and provide on-street parking on the eastbound lanes, the southern curb line would be repurposed for painted on-street parking from Franklin Avenue to St. James Street and exclusive right-turn lanes for all the intersections until Clinton Road. In order to maintain proper alignment in the westbound lanes, the pavement along the southern curb line will be repurpose for exclusive left-turn lanes at every intersection including Franklin Avenue.

Intersection capacity analysis was completed using Synchro 11 software to identify operating conditions including levels of service and travel times. The impacts of the full road diet configuration can be described by comparing the analysis of a Null 2033 condition, which considers the forecasted volumes shown on Figure 2A – 2C without the road diet, to the analysis of a Build 2033 condition, which considers the forecasted volumes with the full road diet configuration. Table 3.1 summarizes the results of the level of service calculations of these two analyses. The detailed level of service table and reports are included under Appendix D.

Table 3.1 – Level of Service Summary Full Road Diet

Intersection		Control	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
			Null 2033	Build 2033	Null 2033	Build 2033	Null 2033	Build 2033
1	Franklin Ave	S	E (76.2)	E (76.2)	D (39.5)	D (39.5)	E (61.4)	E (61.4)
2	Arthur St North	U	C (19.3)	C (18.3)	C (23.0)	C (23.5)	D (28.7)	D (30.1)
3	Arthur St South	U	B (12.7)	C (15.5)	B (12.9)	C (16.6)	B (13.5)	C (18.0)
4	John St North	U	C (19.7)	C (18.7)	C (19.6)	C (21.2)	E (38.3)	E (36.9)
5	John St South	U	D (30.4)	D (30.2)	E (43.2)	E (42.8)	F (59.2)	F (65.2)
6	Washington Ave North	S	D (43.0)	E (76.0)	C (30.2)	D (41.1)	E (67.6)	F (87.1)
7	Washington Ave South	S	D (54.1)	E (69.3)	D (39.2)	F (104)	E (64.7)	F (107.2)
8	Westbury Rd/Butler Pl North	U	E (40.1)	E (40.1)	D (27.8)	D (28.2)	F (161)	F (136.5)
9	Westbury Rd/Butler Pl South	U	D (26.4)	D (26.5)	F (96.8)	F (87.2)	F (89.5)	F (125)
10	Wetherill Rd/Emmet Pl North	U	F (52.2)	E (49.4)	D (27.5)	D (26.8)	F (209)	F (205)
11	Wetherill Rd/Emmet Pl South	U	E (39.5)	E (38.2)	E (47.9)	E (47.9)	F (196.1)	F (278)
12	Clinton Rd	S	F (99.3)	F (99.3)	F (97.9)	F (97.9)	F (100.6)	F (100.6)
13	Clinton Rd/Osborne Rd	S	B (10.5)	B (10.5)	B (10.4)	B (10.4)	B (11.1)	B (11.1)

X (Y.Y) = Level of Service (Average delay in seconds per vehicle)
Control: S = Signalized | U = Unsignalized
LOS for signalized intersections reflects overall
LOS for unsignalized intersection reflects the highest side street stop-controlled delay.

Table 3.1 shows that with the implementation of a full road diet configuration along Stewart Avenue, the overall levels of service will be comparable to the Null condition in 2033 for a majority of the studied intersections. The Washington Avenue, Westbury Road/Butler Place, and Wetherill Road intersections will experience increases in delay between 30 and 90 seconds.

Travel times were obtained from the Synchro 11 software simulations. Table 3.2 summarizes the simulated travel times for a vehicle traveling the length of the corridor from Franklin Avenue to Clinton Road during each study period peak period according to direction of travel in the Null 2033 and the Build 2033 conditions.

Table 3.2 – Null 2033 vs Build 2033 Simulated Travel Times (Minutes:Seconds)

Direction	AM Peak Hour		Midday Peak Hour		Evening Peak Hour	
	Null 2032	Build 2032	Null 2032	Build 2032	Null 2032	Build 2032
Northbound	3:39	4:30	4:39	8:00	5:42	8:35
Southbound	3:49	5:06	3:04	3:21	4:40	4:29

Table 3.2 shows that the simulated travel times for the eastbound direction of travel in the full road diet configuration increase significantly in the midday and PM peak hour (>200 seconds). In the AM peak hour the simulated travel time increases for the eastbound direction of travel by 51 seconds and for westbound direction of travel by 77 seconds. The midday peak hour westbound travel time increases by 17 seconds and the PM peak hour travel time decreases by 11 seconds.

Queue lengths were also obtained from the Synchro 11 software simulations for the northbound and southbound Stewart Avenue approaches at all signalized intersections. Table 3.3 summarizes the 95th-percentile queue length by lane of each approach.

This report summarizes the results of a road diet feasibility study on Stewart Avenue from Franklin Avenue to Clinton Road.

Table 3.3 – Null 2033 vs Build 2033 Simulated 95th-Percentile Queue Lengths (Feet)

Intersection		Lane	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
			Null 2033	Build 2033	Null 2033	Build 2033	Null 2033	Build 2033
2	Franklin Ave							
	Stewart Avenue EB	LTR	359	359	385	385	399	399
		L	352	352	244	244	315	315
	Stewart Avenue WB	T	169	169	185	185	286	286
		R	97	97	49	49	63	66
3	Washington Ave							
	Stewart Avenue EB	LTR/TL	361	643	353	903	593	938
		R*	--	0	--	13	--	53
	Stewart Avenue WB	L*	--	66	--	74	--	114
		LTR/TR	395	739	342	591	461	801
4	Clinton Road							
	Stewart Avenue EB	LT/L*	351	351	356	356	313	313
		TR	326	326	474	474	532	532
	Stewart Avenue WB	LT/L*	139	139	338	338	339	339
		TR	750	750	602	602	785	785

*New lane configuration

Table 3.3 indicates that the longest queueing would occur on the eastbound Stewart Avenue approach during the weekday AM peak hour similar to the existing conditions.

In summary, given the increases in delay and travel times along the corridor, a full road diet configuration does not appear feasible. The travel time increases between Null conditions and Build 2023 falling below 120 seconds, indicate that the road diet condition could be tolerable. The travel time increase between the Null conditions and Build 2033 is significant during the midday and PM peak hours for the eastbound direction. This significant increase is due to the higher volumes in the eastbound during the midday and PM peak hours and the metering of vehicles exiting the study area by the traffic signal at Clinton Road. This reduction in capacity coupled with the metering at the signal constraining vehicles can cause the eastbound queue to encroach upon the majority of intersections west of Clinton Road. Therefore, CM evaluated a partial road diet that provides the necessary capacity for the forecasted volumes while achieving the traffic calming benefits of a road diet where feasible.

D. Sensitivity Analysis – Partial Road Diet

A sensitivity analysis was conducted to evaluate the feasibility of a partial road diet configuration of Stewart Avenue on the eastbound lanes. In the full road diet analysis, the dieted westbound lanes did not show significant impact to the corridor, and it was found to be feasible. In this configuration, the eastbound lanes will maintain three travel lanes east of Westbury Road/Butler Place in order to mitigate the increase in travel time during the weekday midday and PM peak hours exhibited in the analysis of the full road diet configuration. Exhibit 3.1 shows one potential concept depicting the road diet configuration at the Stewart Avenue-Washington Avenue intersections.

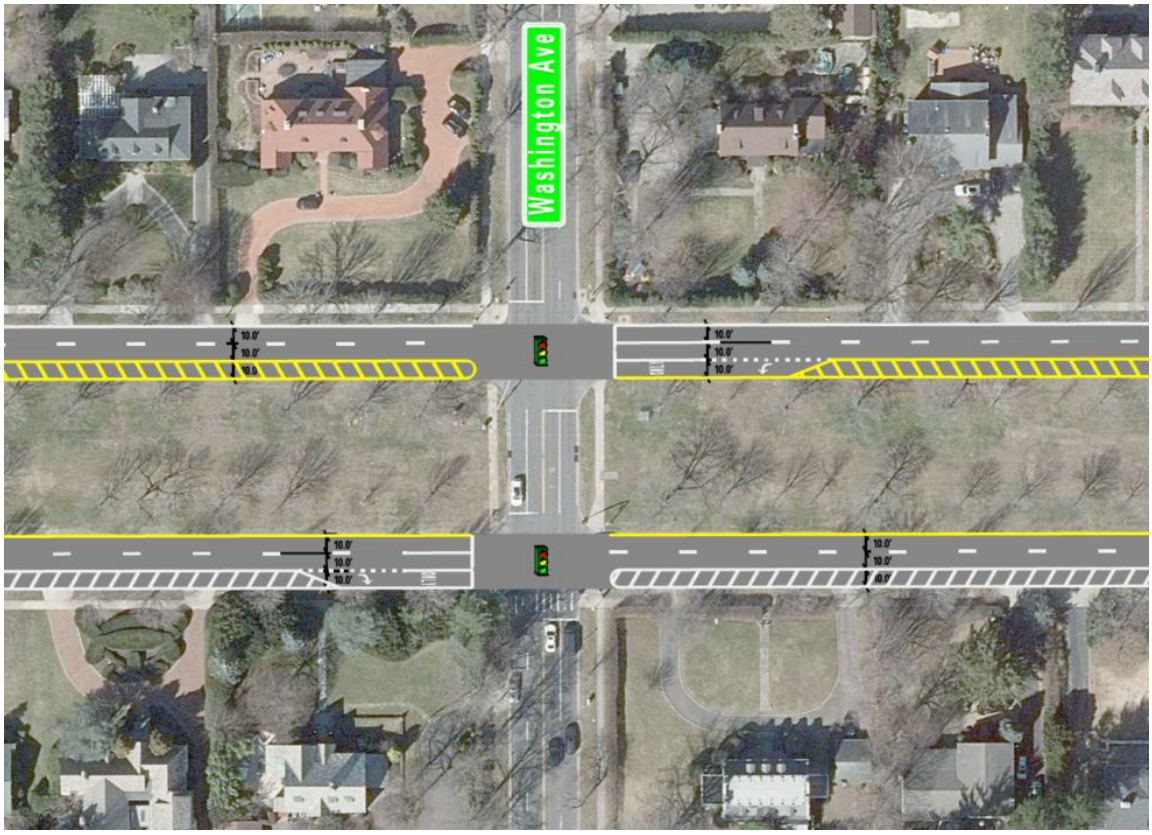


Exhibit 3.1 – Road Diet at Washington Avenue Intersections

Intersection capacity analysis was completed using Synchro 11 software to identify operating conditions including levels of service and travel times. The results of the sensitivity analysis can be described by comparing the analysis of a Null condition, which considers the forecasted volumes with the road diet, to the analysis of the Build 2033 – Sensitivity Analysis (SA) condition, which considers the forecasted volumes with the partial road diet on the eastbound lanes while keeping the westbound lanes dieted. Table 3.4 summarizes the results of the level of service calculations of these two analyses. The detailed level of service table and reports are included under Appendix D.

Table 3.4 – Level of Service Summary Partial Road Diet

Intersection		Control	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
			Null 2033	Build 2033	Null 2033	Build 2033	Null 2033	Build 2033
1	Franklin Ave	S	E (76.2)	E (76.2)	D (39.5)	D (39.5)	E (61.4)	E (61.4)
2	Arthur St North	U	C (19.3)	C (18.3)	C (23.0)	C (23.5)	D (28.7)	D (30.1)
3	Arthur St South	U	B (12.7)	C (15.5)	B (12.9)	C (16.6)	B (13.5)	C (18.0)
4	John St North	U	C (19.7)	C (18.7)	C (19.6)	C (21.2)	E (38.3)	E (36.3)
5	John St South	U	D (30.4)	C (30.0)	E (43.2)	E (42.4)	F (59.2)	F (65.2)
6	Washington Ave North	S	D (43.0)	E (76.0)	C (30.2)	D (41.1)	E (67.6)	F (87.1)
7	Washington Ave South	S	D (54.1)	E (69.3)	D (39.2)	F (104)	E (64.7)	F (107.2)
8	Westbury Rd/Butler Pl North	U	E (40.1)	E (40.1)	D (27.8)	D (28.1)	F (161)	F (136.5)
9	Westbury Rd/Butler Pl South	U	D (26.5)	D (26.4)	F (96.8)	F (96.8)	F (89.5)	F (89.5)
10	Wetherill Rd/Emmet Pl North	U	F (52.2)	E (47.9)	D (27.5)	D (26.8)	F (209)	F (205.5)
11	Wetherill Rd/Emmet Pl South	U	E (39.5)	E (39.5)	E (47.9)	E (47.9)	F (196.1)	F (196.1)
12	Clinton Rd	S	F (99.3)	F (99.3)	F (97.9)	F (97.9)	F (100.6)	F (100.6)
13	Clinton Rd/Osborne Rd	S	B (10.5)	B (10.5)	B (10.4)	B (10.4)	B (11.1)	B (11.1)

X (Y.Y) = Level of Service (Average delay in seconds per vehicle)
Control: S = Signalized | U = Unsignalized
LOS for signalized intersections reflects overall
LOS for unsignalized intersection reflects the highest side street stop-controlled delay.

Table 3.4 shows that with the implementation of a partial road diet on the eastbound lanes along Stewart Avenue, the overall levels of service will be comparable to the existing roadway configuration.

Travel times were obtained from the Synchro 11 software simulations. Table 3.5 summarizes the simulated travel times for a vehicle traveling the length of the corridor from Franklin Avenue to Clinton Road during each study period peak period according to direction of travel in the Null 2033 and the Build SA 2033 conditions.

Table 3.5 – Null 2033 Condition vs Build 2033 SA Simulated Travel Times (Minutes:Seconds)

Direction	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
	Null 2033	Build 2033 SA	Null 2033	Build 2033 SA	Build 2033	Build 2033 SA
Eastbound	3:39	3:41	4:39	7:09	5:42	7:28
Westbound	3:49	6:02	3:04	3:10	4:40	6:05

Table 3.5 shows that the simulated total travel times for eastbound lanes increase by two second in the AM peak hour, 150 seconds in the midday peak hour, and 106 second in the PM peak hour. For the westbound lanes, the travel times increase by 133 seconds in the AM peak hour, six seconds in the midday peak hour, and 85 seconds in the PM peak hour.

Queue lengths were also obtained from the Synchro 11 software simulations for the eastbound and westbound Stewart Avenue approaches at all signalized intersection. Table 3.6 summarizes the 95th-percentile queue length by lane of each approach.

Table 3.6 – Build 2032 vs Build 2032 Sensitivity Analysis Simulated 95th-Percentile Queue Lengths

Intersection		Lane	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
			Null 2033	Build 2033	Null 2033	Build 2033	Null 2033	Build 2033
2	Franklin Ave Stewart Avenue EB Stewart Avenue WB	 LTR L T R	 359 352 169 97	 359 352 169 97	 385 244 185 49	 385 244 185 49	 399 315 286 63	 399 315 286 66
6/7	Washington Ave Stewart Avenue EB Stewart Avenue WB	 LTR/TL R* L* LTR/TR	 361 -- -- 395	 643 0 66 739	 353 -- -- 342	 903 13 74 591	 593 -- -- 461	 938 53 114 801
12	Clinton Road Stewart Avenue EB Stewart Avenue WB	 LT/L* TR LT/L* TR	 351 326 139 750	 351 326 139 750	 356 474 338 602	 356 474 338 602	 313 532 339 785	 313 532 339 785

*Lane Configuration in Build 2033 Condition

Table 3.6 indicates that the queueing would remain the same for this new alternative at the Franklin Avenue and Clinton Road intersection as in the Null conditions. At Washington Avenue intersections, the queue will increase due to the lane configuration changes.

Overall, the biggest benefit that a partial road diet provides is the reduction in the travel time for the eastbound lanes during the midday and PM peak hours compared to the full road diet. The partial road diet also allows for the implementation of the on-street parking as requested by the Village at the beginning of the study. Delay and queues at intersections remain the same as the intersection configurations are not changing between partial and full road diets. Operations could be further improved with modifications of the signal timings along the corridor; however, any modifications to the signal timings would require review and approval by the NCDPW.

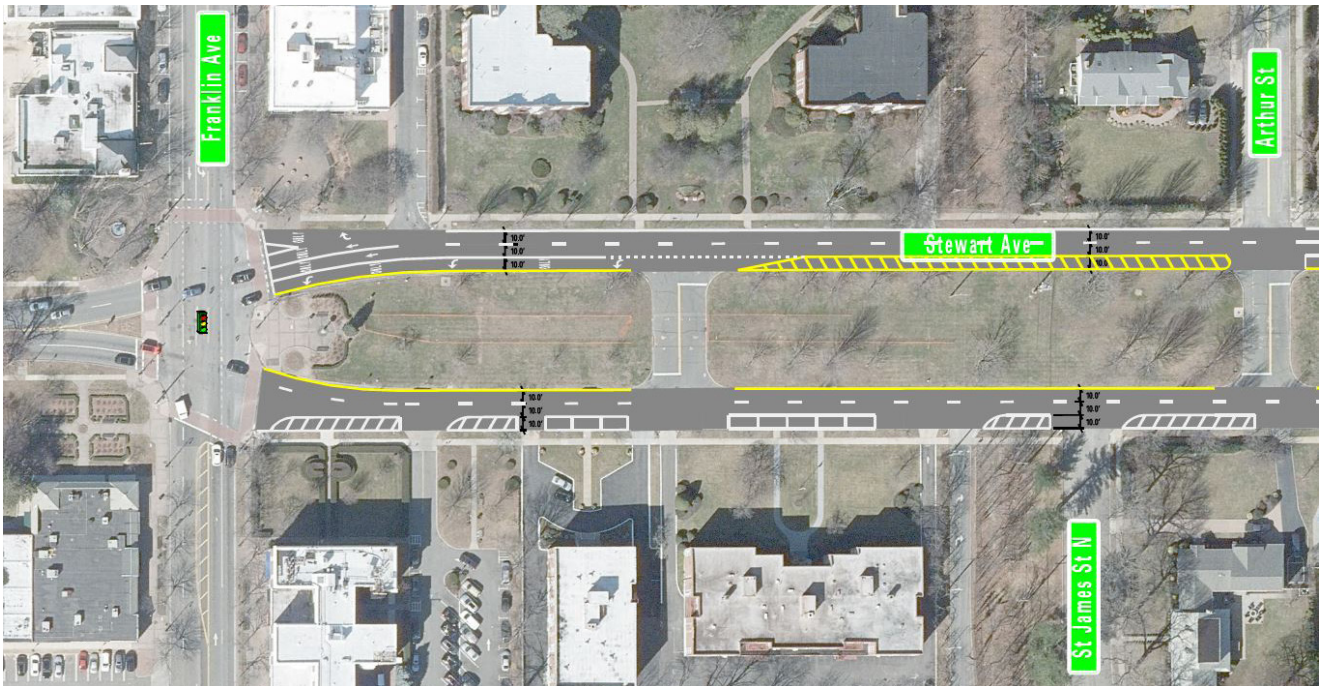
CHAPTER 4. CONCLUSIONS AND RECOMMENDATIONS

A typical road diet involves the reallocation of four travel lanes (two in each direction) to three-lane configuration consisting of one travel lane in each direction with a center two-way left-turn lane to improve mobility for all users. The study evaluate the implementation of a configuration from three to two lanes in each direction from Stewart Avenue-Franklin Avenue intersection to the Stewart Avenue-Clinton Road intersection.

Based on the evaluation, a road diet is feasible and would not be detrimental to vehicular mobility through the corridor. Publications from the FHWA and AASHTO indicate several benefits of road diets that adhere to the Complete Streets Policy adopted by Nassau County including:

- Reductions in number and severity of crashes
- Reduction in speeds
- Fewer travel lanes for pedestrians to cross

The extra space gained by reducing the number of lanes from three to two in each direction, could be used for paved shoulders, parking spaces and exclusive turn lanes at intersections as shown in the image below, which will be confirmed during detailed design.



Conce Exhibit 4.1 – Stewart Avenue Road Diet On-Street Parking Spaces and Turn-Lanes at Intersections pt 2 – Bike Lanes

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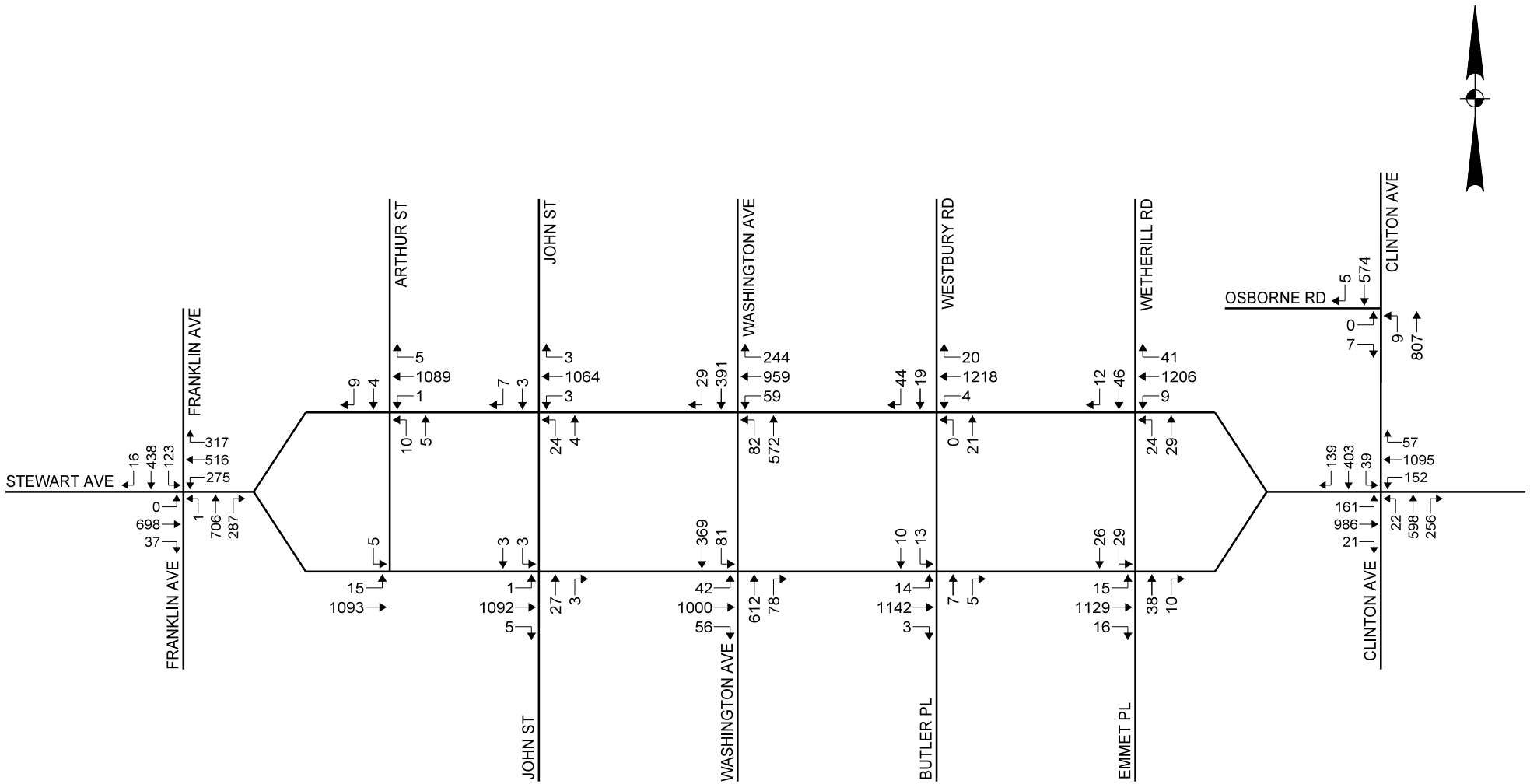

2023 EXISTING TRAFFIC VOLUMES
AM PEAK HOUR

GARDEN CITY- STEWART AVENUE
VILLAGE OF GARDEN CITY
NASSAU COUNTY, NEW YORK

Creighton Manning

PROJECT: 123-087	DATE: 7/2023	FIGURE: 1A

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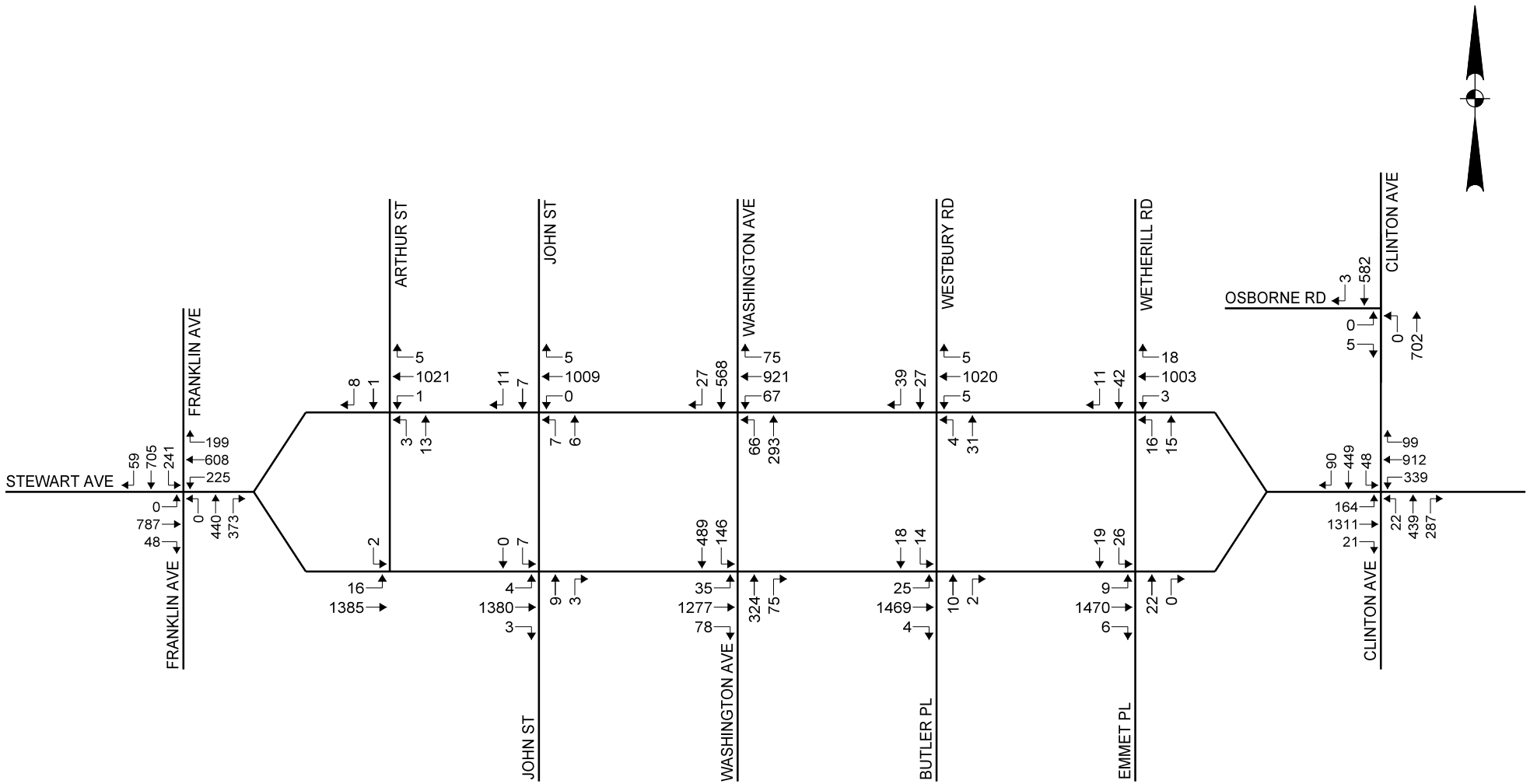

2023 EXISTING TRAFFIC VOLUMES
SCHOOL DISMISSAL PEAK HOUR

GARDEN CITY- STEWART AVENUE
VILLAGE OF GARDEN CITY
NASSAU COUNTY, NEW YORK

Creighton Manning

PROJECT: 123-087	DATE: 7/2023	FIGURE: 1B

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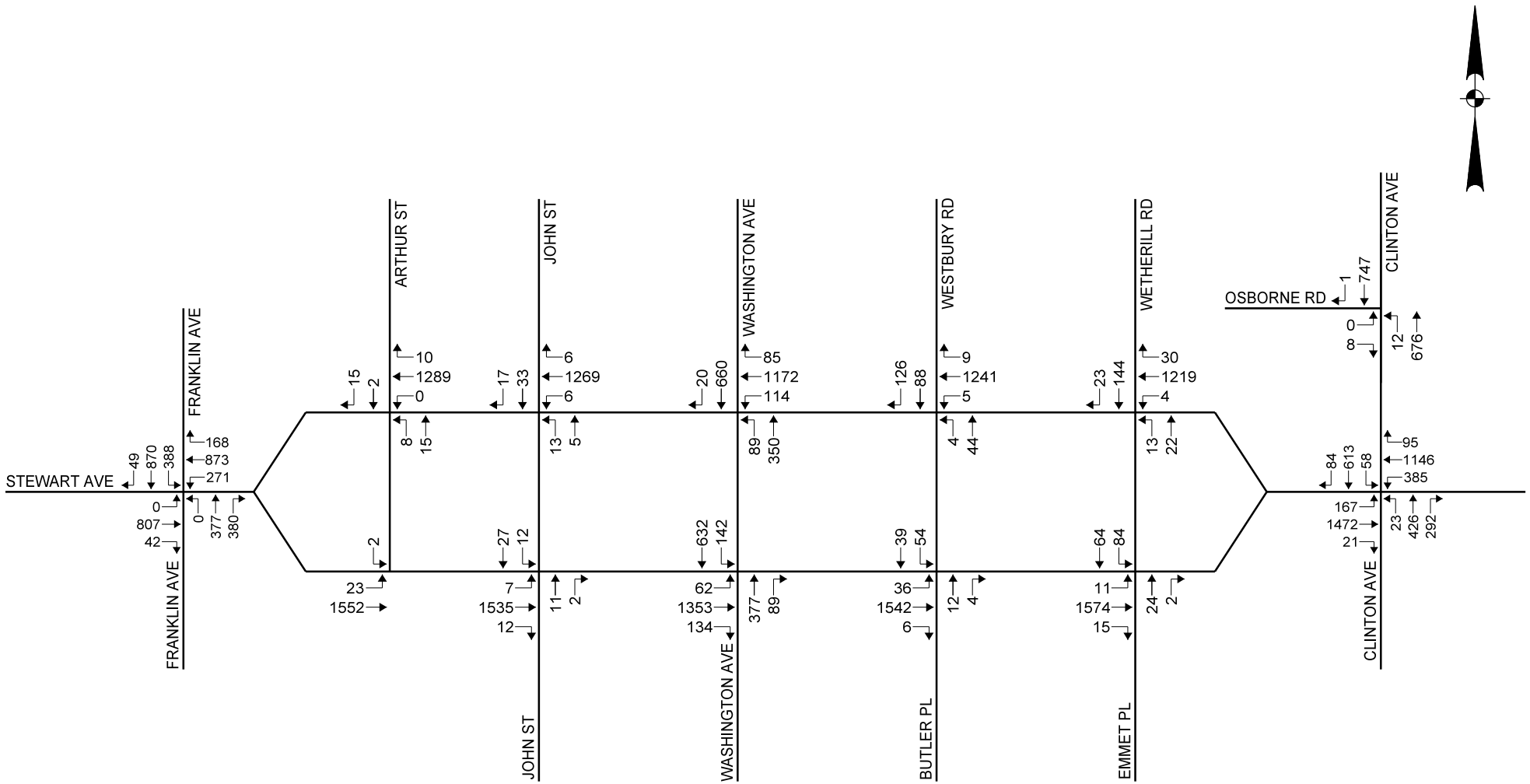

2023 EXISTING TRAFFIC VOLUMES
PM PEAK HOUR

GARDEN CITY- STEWART AVENUE
VILLAGE OF GARDEN CITY
NASSAU COUNTY, NEW YORK

Creighton Manning

PROJECT: 123-087	DATE: 7/2023	FIGURE: 1C

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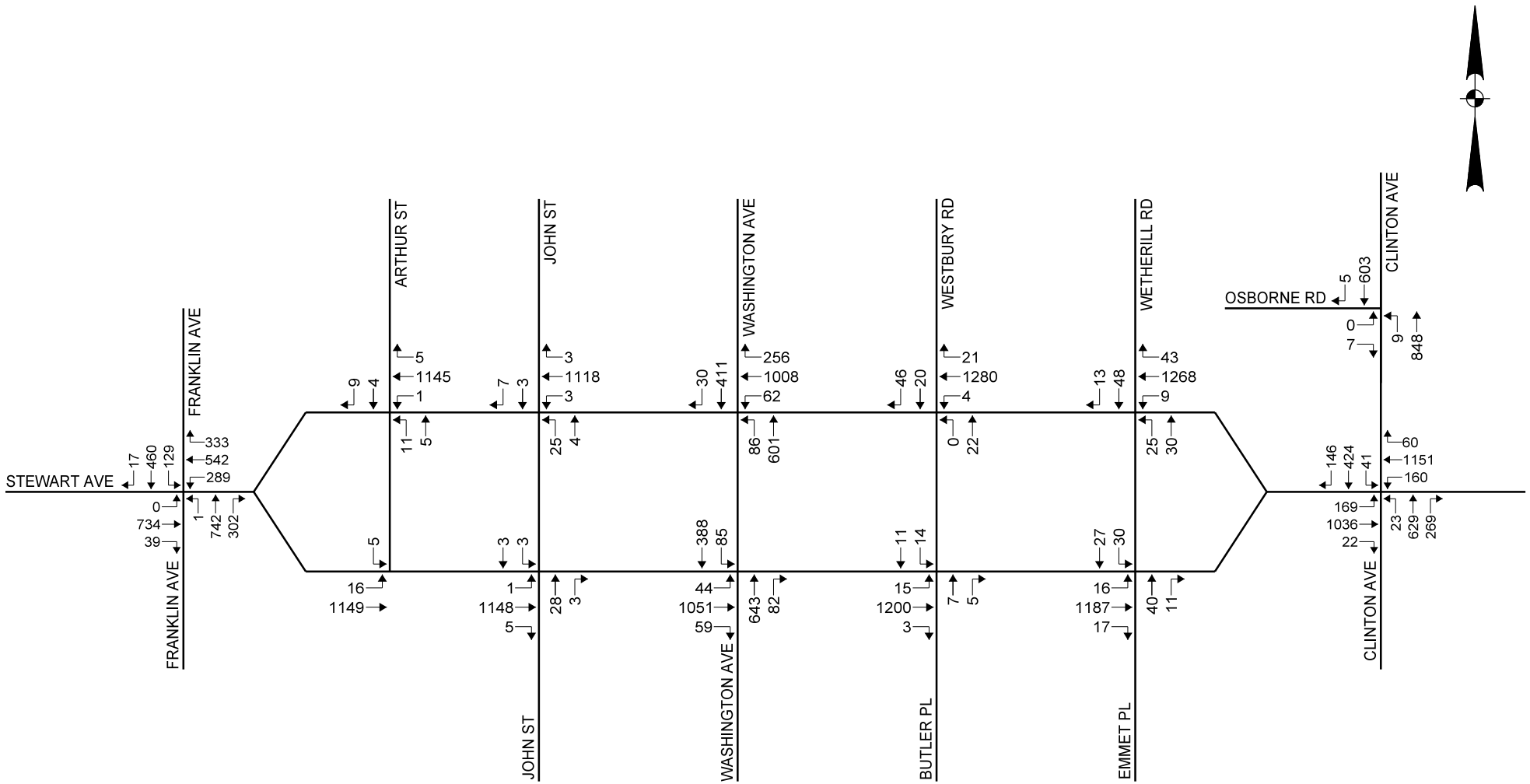

2033 TRAFFIC VOLUMES
AM PEAK HOUR

GARDEN CITY- STEWART AVENUE
VILLAGE OF GARDEN CITY
NASSAU COUNTY, NEW YORK

Creighton Manning

PROJECT: 123-087	DATE: 7/2023	FIGURE: 2A

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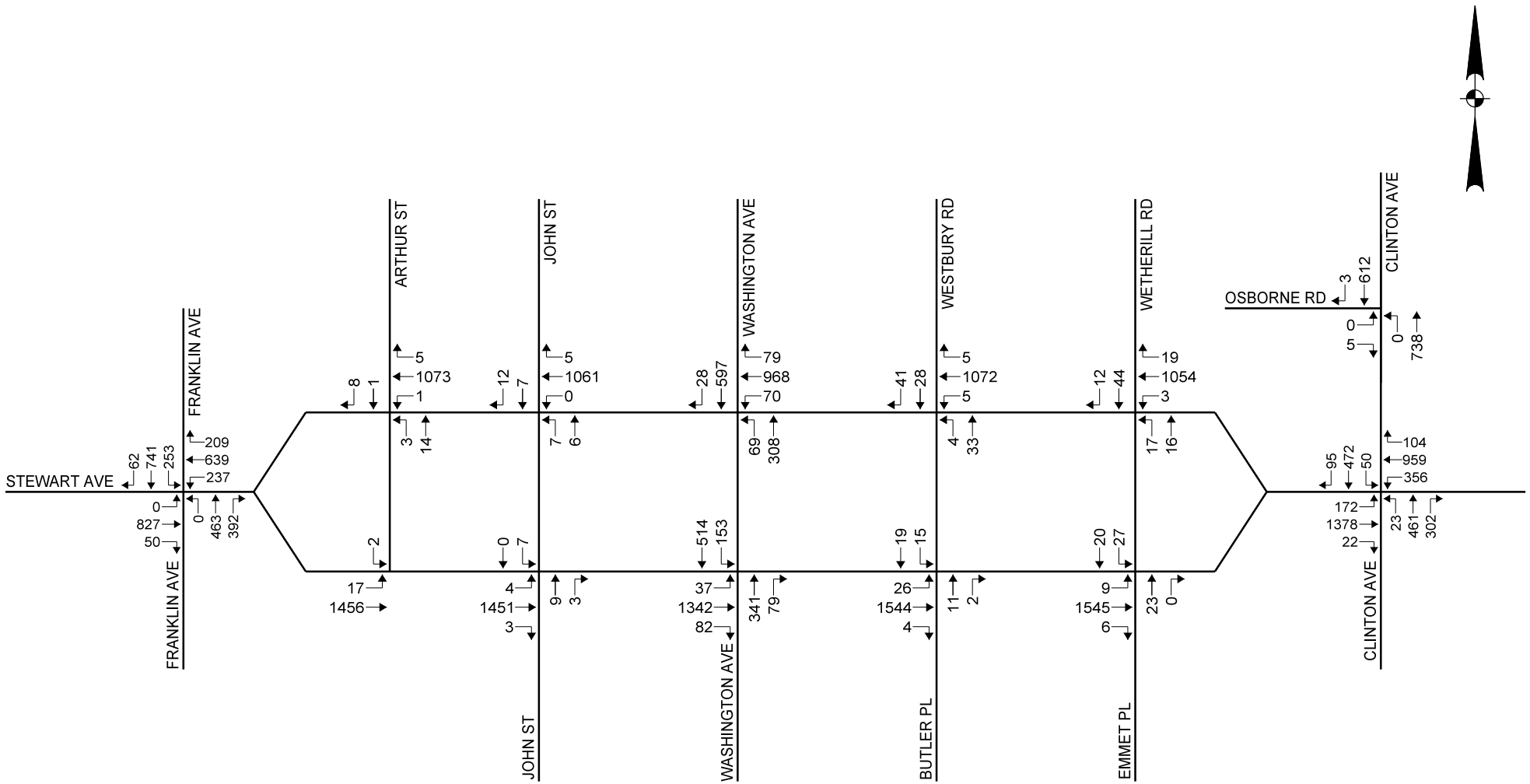

2033 TRAFFIC VOLUMES
SCHOOL DISMISSAL PEAK HOUR

GARDEN CITY- STEWART AVENUE
VILLAGE OF GARDEN CITY
NASSAU COUNTY, NEW YORK

Creighton Manning

PROJECT: 123-087	DATE: 7/2023	FIGURE: 2B

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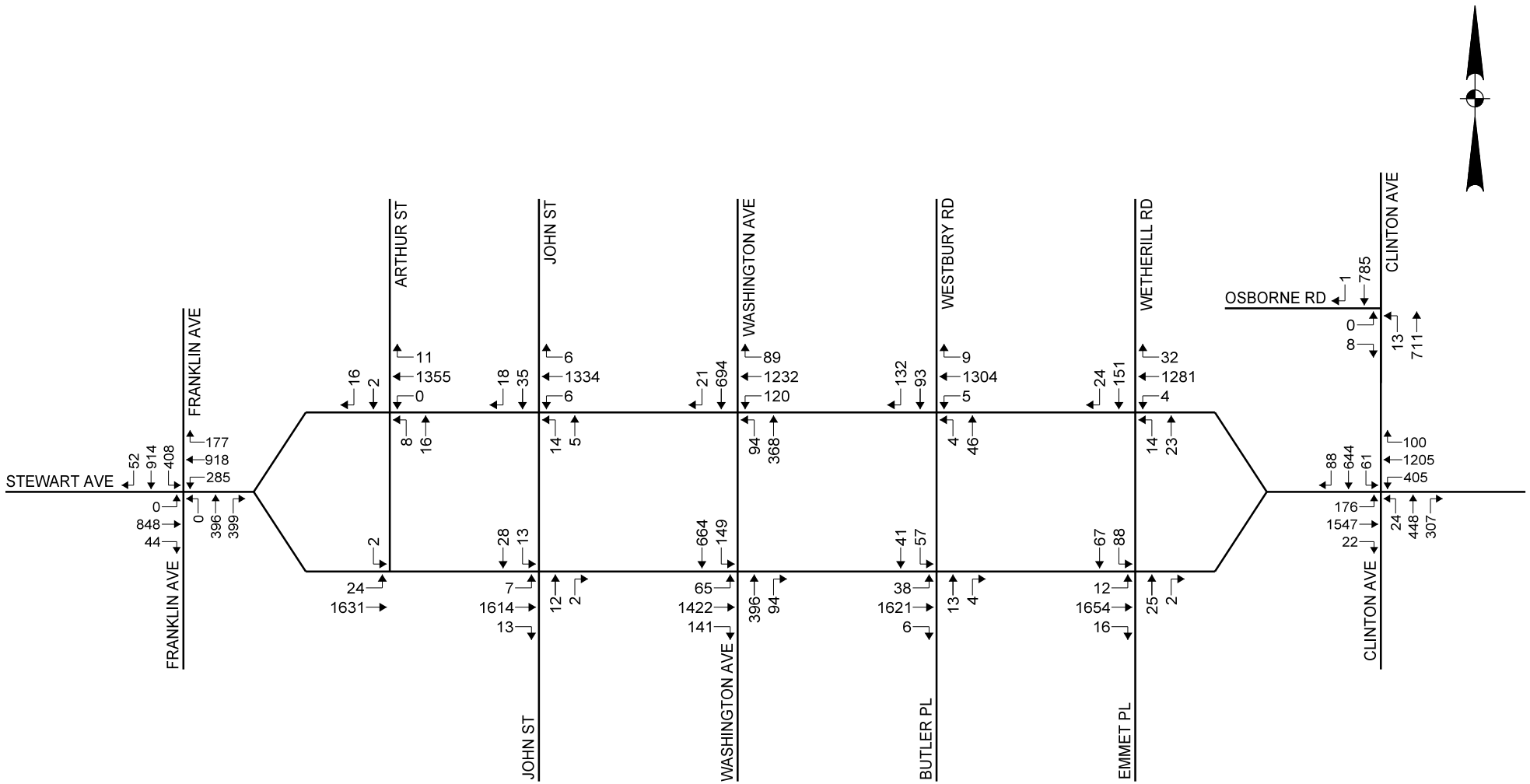

2033 TRAFFIC VOLUMES
PM PEAK HOUR

GARDEN CITY- STEWART AVENUE
VILLAGE OF GARDEN CITY
NASSAU COUNTY, NEW YORK

Creighton Manning

PROJECT: 123-087	DATE: 7/2023	FIGURE: 2C